

**BOARD MEETING AGENDA
SPECIAL MEETING OF THE BOARD OF DIRECTORS OF
CITRUS HEIGHTS WATER DISTRICT (CHWD)
July 24, 2017 beginning at 6:00 PM**



**DISTRICT ADMINISTRATIVE OFFICE AND CORPORATE YARD
6230 SYLVAN ROAD, CITRUS HEIGHTS, CA**

In compliance with the Americans with Disabilities Act, if you have a disability and need a disability-related modification or accommodation to participate in this meeting, please contact the General Manager at (916) 725-6873. Requests must be made as early as possible, and at least one full business day before the start of the meeting.

CALL TO ORDER:

Upon request, agenda items may be moved to accommodate those in attendance wishing to address that item. Please inform the General Manager.

ROLL CALL OF DIRECTORS:

PLEDGE OF ALLEGIENCE:

TOUR OF CORPORATE YARD SAFETY IMPROVEMENT PROJECT SITE

Conduct tour of District's Corporate Yard Safety Improvements Project site.

VISITORS:

PUBLIC COMMENT:

The Public shall have the opportunity to directly address the Board on any item of interest to the public before or during the Board's consideration of that item pursuant to Government Code Section 54954.3. Public comment on items of interest within the jurisdiction of the Board is welcome. The Presiding Officer will limit comments to three (3) minutes per speaker.

(A) Action Item

(D) Discussion Item

(I) Information Item

BUSINESS:

B-1. Discussion and Possible Action – Corporate Yard Safety Improvements Project (A)

Consider the bids received for the Corporate Yard Safety Improvements Project. Evaluate options and potentially approve one of the possible courses of action, including:

1. No Project. Reject all bids and transfer funds budgeted for the project to the Capital Improvement Reserve.
2. Re-Bid Project. Reject all bids, direct staff to re-advertise the project, encumber \$1,385,688 in funds from the 2017 budget, and authorize a budget amendment and encumbrance in the amount of \$800,000. An additional budget request/amendment in the 2018 budget will be anticipated.
3. Phased Project. Reject all bids, direct staff to re-advertise the project in two or more phases, encumber \$1,385,688 in funds from the 2017 budget, and authorize a budget amendment/encumbrance in the amount of

\$800,000. An additional budget requests/amendments in the 2018 and 2019 budgets will be anticipated.

4. Accept Bid. Accept a bid dated June 28, 2017 from PnP Construction for construction of the Corporation Yard Safety Improvements Project, reject all other bids, authorize the General Manager to execute an agreement with PnP Construction for a not-to-exceed amount of \$1,764,474 subject to minor modifications of the General Counsel, encumber \$1,385,688 in funds from the 2017 budget, authorize a budget amendment in the amount of \$1,246,639 and authorize the General Manager to execute a contract amendment with Domenichelli and Associates for construction management services.

ADJOURNMENT:

CERTIFICATION:

I do hereby declare and certify that this agenda for this Special Meeting of the Board of Directors of the Citrus Heights Water District was posted in a location accessible to the public at the District Administrative Office Building, 6230 Sylvan Road, Citrus Heights, CA 95610 at least 24 hours prior to the special meeting in accordance with Government Code Section 54954.2.



Hilary M. Straus, General Manager/ Secretary

Dated: July 20, 2017

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS JULY 24, 2017 SPECIAL MEETING

SUBJECT : DISCUSSION AND POSSIBLE ACTION—CORPORATION YARD
SAFETY IMPROVEMENTS PROJECT

STATUS : Action Item

REPORT DATE : July 19, 2017

PREPARED BY : Paul A. Dietrich, Project Manager
Melissa A. Pieri, Engineering Manager/District Engineer

OBJECTIVE:

Consider the bids received for the Corporation Yard Safety Improvements Project. Evaluate options and potentially approve one of the possible courses of action.

BACKGROUND AND ANALYSIS:

As background, Citrus Heights Water District received five bids on June 28, 2017 as follows:

1. PnP Construction, Inc.	\$ 1,764,474.00
2. BRCO Constructors, Inc.	\$ 1,856,000.00
3. Myers and Sons Construction, Inc.	\$ 1,883,000.00
4. Civil Engineering Construction, Inc.	\$ 2,039,000.00
5. BOBO Construction, Inc.	\$ 2,368,500.00

CHWD's contract engineer, Domenichelli and Associates, has analyzed the bids and determined that the apparent low bidder is PnP Construction, Inc. of Auburn, CA. The Engineer's Estimate was \$1.329 million.

The Board has scheduled a special meeting on Monday, July 24th at 6 PM to consider the construction bids, options and next steps with regard to Project.

Next Steps

Following a Project Site walking tour, the Project Team will provide a comprehensive presentation to the Board concerning the Project.

The presentation includes the following elements:

- Why this project was initiated
- Funding history of this project
- Overview of how the Engineer's Estimate was developed
- Analysis of the bids, including the lowest responsive bid, versus the Engineer's Estimate
- Presentation and Analysis of the following Options:
 - Do not Build/No Project
 - Re-bid the Project for completion in 2018
 - Phase the Project over 2018 and 2019
 - Build the Project Now with Lowest Responsive Bidder

**Corporation Yard Safety Improvements Project
Special Board Meeting of July 24, 2017
Page 2**

The agenda is noticed for Board discussion and possible action concerning any one of the options that are provided.

A copy of the construction agreement with PnP Construction accompanies this staff report as Attachment 2 for discussion and possible approval should the Board opt to implement Option 4. Moreover, to complete Option 4, Board approval of a contract amendment with Domenichelli and Associates is requested to ensure that the necessary support services are in place during the construction phase of the Project. Additional engineering support work is required due to the discovery issues in the field concerning the required abandonment/replacement of a sewer line, identified during the Plans, Specifications & Estimates (PS&E) phase; Stormwater Pollution Prevention Plan (SWPPP)/environmental compliance support work; and, other construction support work required based upon the final scope of work identified through the Project Committee/PS&E process.

RECOMMENDATION:

After analyzing the qualitative and quantitative issues associated with each option, the staff recommendation it to implement Option 4. A detailed analysis of the options is included in the staff presentation (Attachment 1 of this staff report), and will be provided to the Board with an opportunity for the Board Members' questions and comments on Monday evening, July 24th.

ATTACHMENTS:

1. Staff Presentation to the Board of Directors for July 24, 2017
2. Agreement with PnP Construction, Inc.
3. Contract Amendment with Domenichelli and Associates for additional engineering support services required to complete Option 4.

ACTION:

Moved by Director _____, Seconded by Director _____, Carried _____

ATTACHMENT 1

Staff Presentation to the Board of Directors,
July 24, 2017



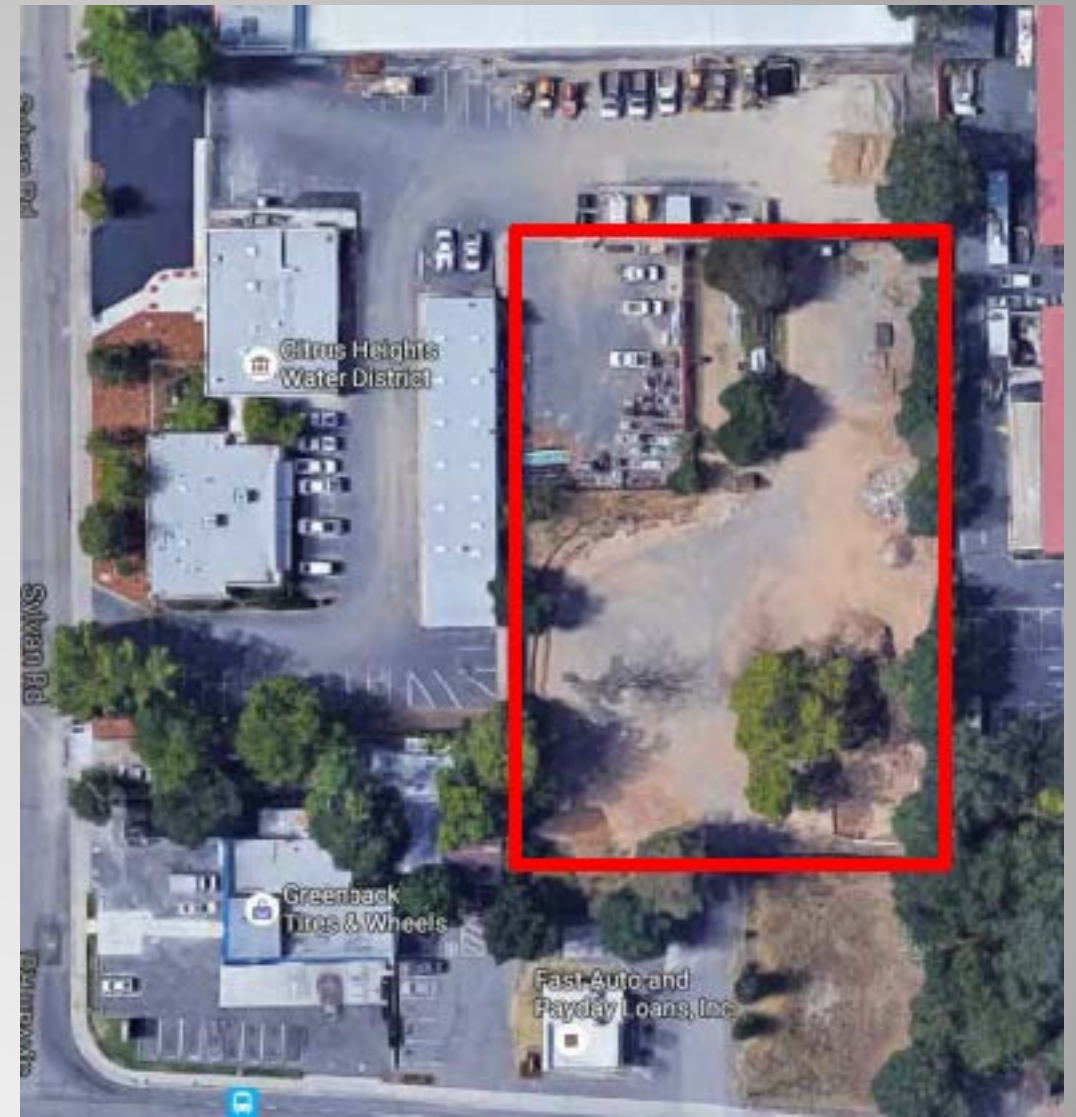
2017 Corporation Yard Safety Improvement Project

Board Meeting of July 24, 2017

Presentation Outline

July 24, 2017

- Project Goals
- Project/Budget History
- Analysis of Engineer's Estimate and Construction Bids
- Options
- Next Steps



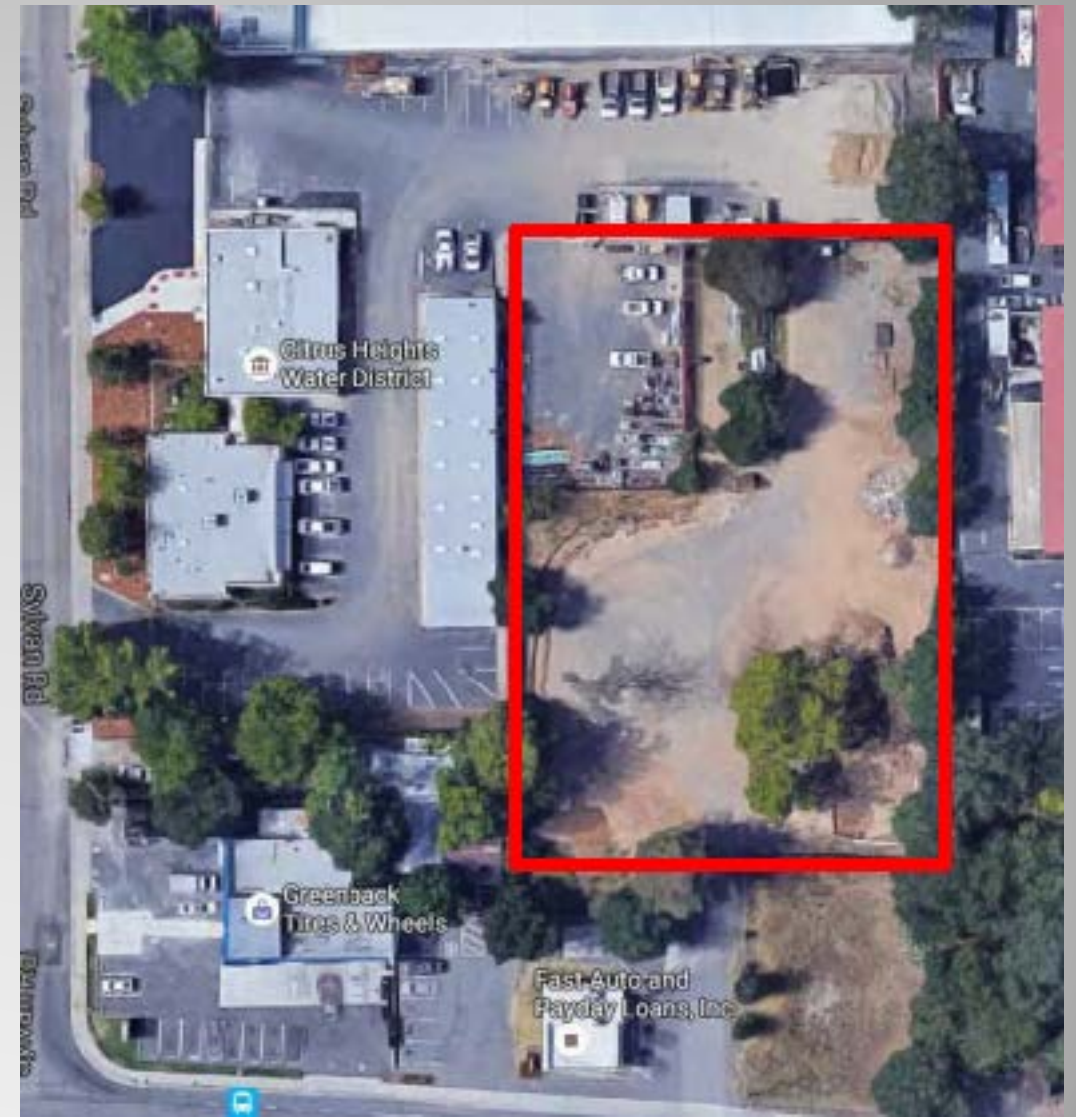
Project Goals

- Improve Employee Safety
- Increase Operational Efficiency
- Improve Corporation Yard Security
- Achieve Environmental Compliance
- Design and build a functional facility that will last
- Utilize an interdepartmental project design team
- Value engineer the project wherever possible
- Complete the project by end of 2017 (weather permitting)



Project/Budget History

- The Project Area is comprised of land that was acquired in pieces over the past 15 years
- The area remains unimproved
- It has been used for a variety of purposes including spoils dumping and transfer, surplus material storage, vac pit spoils, etc.
- Initial plans to start improvement of the area appear in the budget starting in 2014



Budget History

Year	Budget	Expenditure	Description
2014	\$2,500	\$0	<ul style="list-style-type: none"> Funds were budgeted for "Security Fencing on Shuman Property" Basic consideration of project costs
2015	\$109,500	\$0	<ul style="list-style-type: none"> Additional needs considered <ul style="list-style-type: none"> Pave Shuman Ln lot Construct concrete excavator spills pit
2016	\$109,500*	\$0	<ul style="list-style-type: none"> 2015 Budget allocations were *encumbered/carry forward More detailed project planning and design process was initiated
2017	\$1,385,688	\$214,697	<ul style="list-style-type: none"> Budget based on July 2016 Conceptual Plan Expenditures include PS&E, site prep, staff time

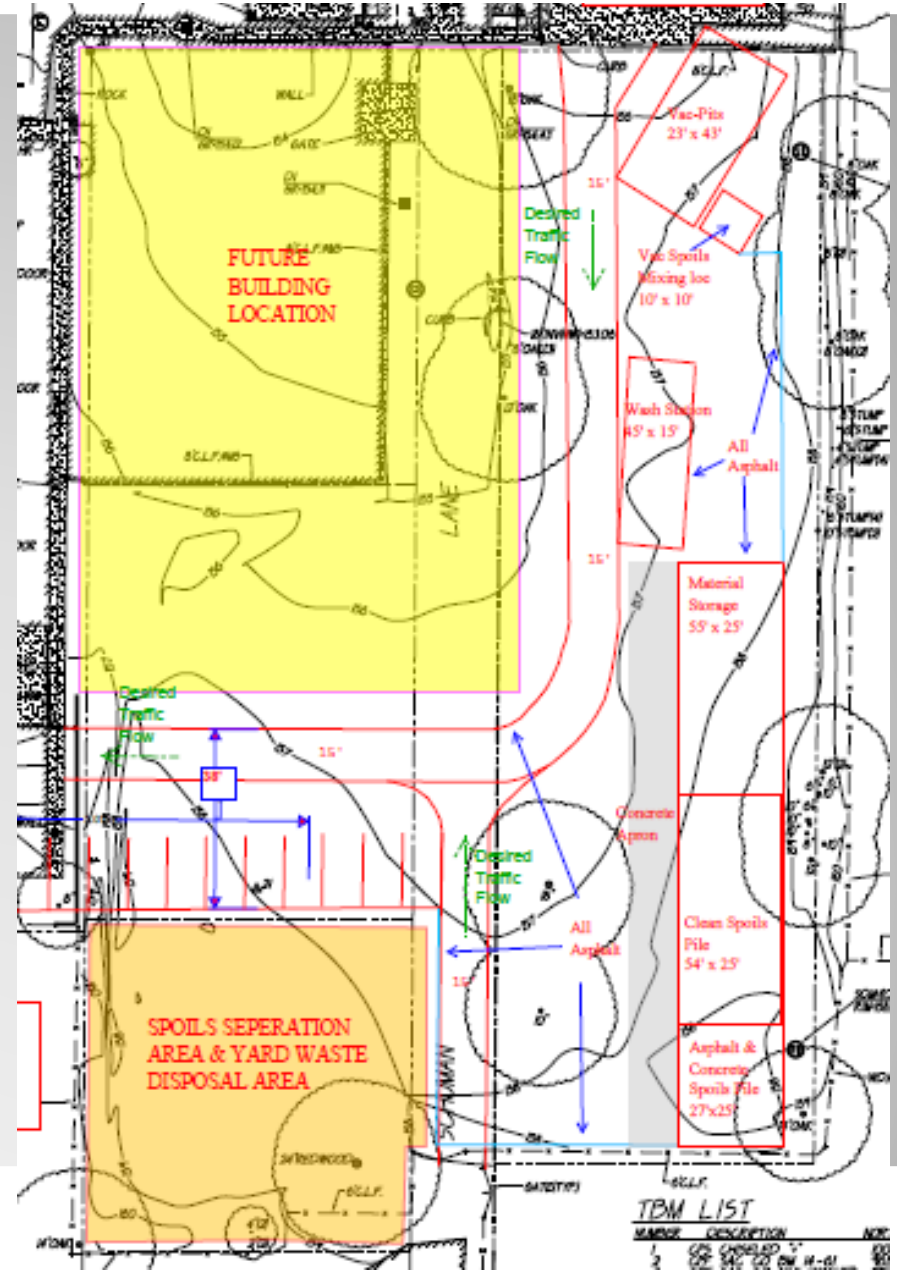
Project Planning and Design – 2016/17

- Board identified Corporation Yard Safety Improvement Project as a Strategic Planning Item – June 2016
- Planning and design process:
 - Established a Technical Review Committee tasked with developing and sharing expertise to design a functional facility – July 2016
 - Developed an initial Concept Plan used to develop the 2017 Project Budget (CHWD Staff and Contract Engineer) – Aug 2016
 - Prepared Request for Proposal (RFP) for Plans, Specifications and Estimates (PS&E) and Construction Management – Sept 2016
 - Domenichelli and Associates (D&A) was awarded contract – Oct 2016
 - Through PS&E process a final design and Engineer's Estimate was developed and other project approval requirements and associated costs were identified (e.g., sewer line replacement & City requirements) – Nov 2016 thru May 2017
 - Project updates to Board: 60% - Feb 2017, 90% - April 2017, 100% - May 2017; staff reported that a full project cost estimate and budget amendment request would be presented at the conclusion of PS&E and award of construction contract.
- Bids received – June 28, 2017

Technical Review Committee

- Many Project Stakeholders
- Conducted weekly meetings
- Visited several other water agencies' facilities
- Interviewed other water agency Operations Managers and staff
- Photographed and measured other facilities
- Conducted research into best practices
- Conducted numerous interviews with CHWD staff
- Measured and prepared recommendations for yard improvements with D&A
- Final layout and scale of facility within PS&E process finalized by Jan 2017

July 2016 Conceptual Plan

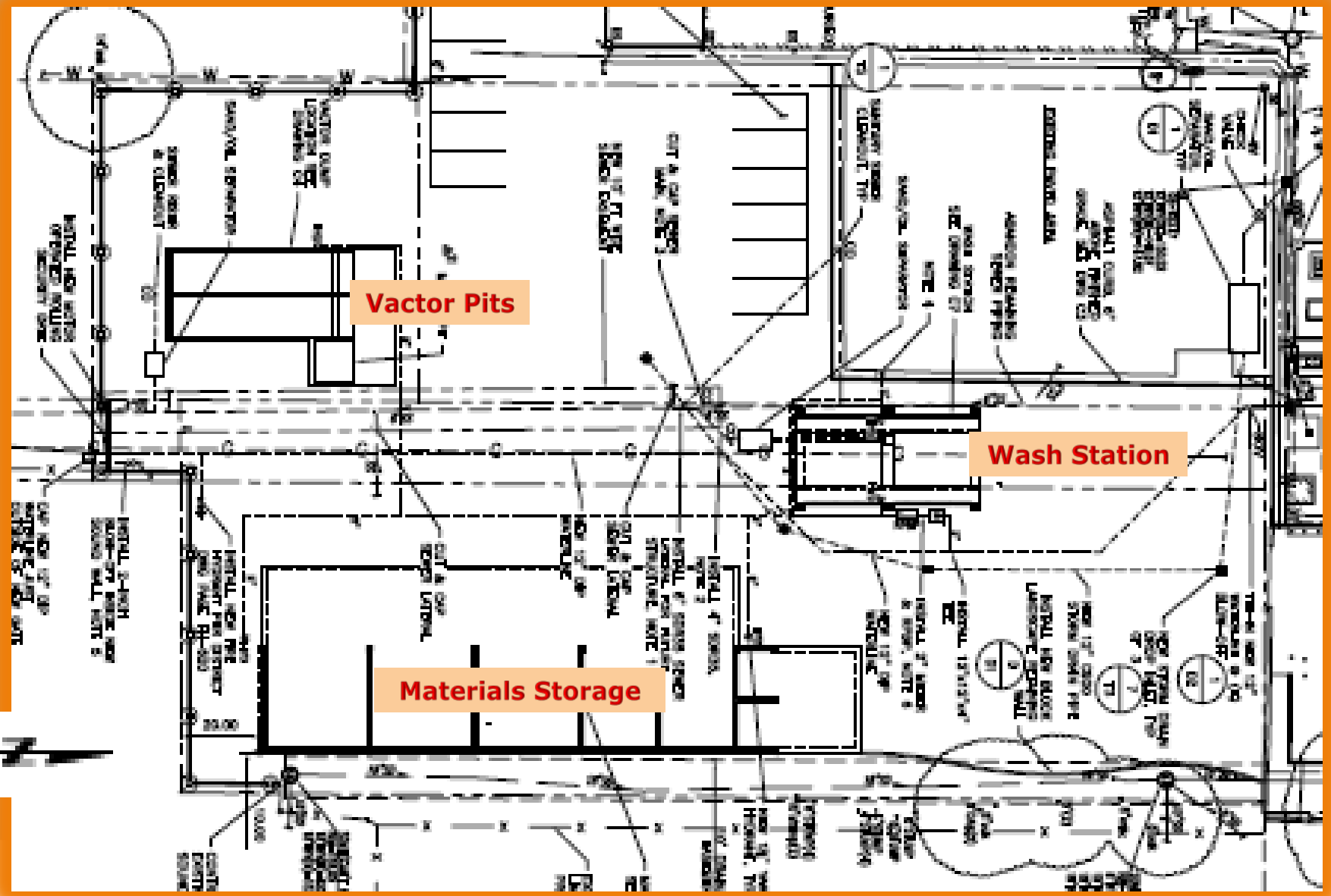


PS&E is an Iterative Process by Design

- Determined to “Get it Right”
- Merged lots (Remove additional setbacks)
- Identified existing sewer deficiencies and Sewer District requirements
- Achieved environmental compliance (2 more sand/oil separators)
- Expanded Materials Storage Area (Dry spoils)
- Identified additional space needs (Expanded project area)
- Storm Water Pollution Prevention Plan (SWPPP)
- Increased paving thickness (3” to 4”)
- Determined need for renting a temporary yard for worker efficiency and safety (Vactor Pits and Material Spoils)
- Added Engineering Services to address items listed above

June 2017 100% Project Plans

Greenback Lane



Engineer's Estimating Methodology

- Created using final quantities from design
- Contact manufacturer's for estimate of specialty items – Metal buildings, manholes, oil/sand separators
- Utilize unit costs from past estimates and bids
- Adjust unit costs for quantity or difficulty level compared to previous bids
- Compare unit costs to available cost data (such as Caltrans summary of cost information from 2016)
- Consult Contractors for input on difficult items
- Include contingency to account for project unknowns

Example Unit costs from Engineer's 100% Opinion of Probable Costs

Item	Description	Quantity	Units	Unit Cost	Price
3.02	Aggregate Base (@ 10.5" Depth)	1548	TON	\$55	\$85,100
3.03	AC Paving (@ 4" Depth)	830	TON	\$167	\$138,600
9.01	Excavation (30" Deep)	480	CY	\$35	\$16,800
9.02	AB under slab, 6" Thick	119	CY	\$85	\$10,100
9.03	Floor Slab, 16" Thick	179	CY	\$525	\$93,900
9.04	Concrete Apron (Front of Bins), 12" Thick	103	CY	\$525	\$54,300
9.08	Metal Building Structure	1	LS	\$119,500	\$119,500

Estimate is our opinion of probable costs based on best data available at the time of final design

Bid Results Comparison

- Difference between Estimate \$435,474 (32.8% difference)
- Note that items 18 and 19 were added by addendum and not included in EE
- Variation between bids largely due to bidders anticipated schedules (loading profit in items they anticipate completing first)
- Cluster of bids (\$1.76 to \$1.88 Million) indicates that bids are reflective of current market

Bid Item	Description	EST	PnP Construction	BRCO Constructors	Myers & Sons Construction	Civil Engineering Construction	BOBO Construction
		Total	Unit \$	Unit \$	Unit \$	Unit \$	Unit \$
1	Permits and Insurance	\$20,000	\$30,000	\$100,000	\$22,000	\$25,000	\$6,500
2	Mobilization and Demobilization	\$55,000	\$50,000	\$80,000	\$25,000	\$101,000	\$13,000
3	Sheeting, Shoring, and Bracing	\$10,000	\$5,100	\$4,000	\$18,000	\$5,000	\$6,500
4	SWPPP Implementation	\$30,000	\$11,300	\$30,000	\$13,000	\$17,000	\$13,000
5	Demolition and Abandonment	\$20,400	\$45,200	\$35,000	\$32,000	\$45,000	\$89,000
6	Site Grading	\$32,200	\$85,000	\$60,000	\$220,000	\$70,000	\$345,000
7	Site Pavement and Striping	\$227,200	\$257,500	\$180,000	\$103,000	\$207,000	\$131,000
8	Decorative Retaining Wall and Landscaping	\$4,000	\$16,200	\$25,000	\$29,000	\$25,000	\$70,000
9	Perimeter Sound Wall and Motor Operated Gate	\$184,600	\$120,500	\$125,000	\$175,000	\$190,000	\$145,000
10	Site Electrical and Control Panel	\$78,000	\$153,600	\$150,000	\$139,000	\$165,000	\$166,000
11	Site Water Distribution Piping	\$21,100	\$25,400	\$35,000	\$68,000	\$52,000	\$70,000
12	Wash and Vactor Pit Drain Sewer System	\$45,100	\$22,000	\$50,000	\$77,000	\$11,000	\$13,000
13	Install New Sewer Pipeline and Install New Manhole connection	\$30,000	\$32,800	\$20,000	\$80,000	\$87,000	\$84,000
14	Site Drainage System	\$42,200	\$55,400	\$30,000	\$85,000	\$92,000	\$34,000
15	Vactor Disposal Pits and Mixing Facility	\$56,300	\$122,500	\$250,000	\$117,000	\$155,000	\$369,000
16	Vehicle Wash Facility	\$134,800	\$144,200	\$190,000	\$178,000	\$230,000	\$320,000
17	Material Storage Facility	\$368,100	\$535,874	\$450,000	\$502,000	\$547,000	\$442,000
18	Winterization/Stabilization of site		\$13,500	\$12,000		\$6,000	\$6,500
19	Grading for final pavement following winterization		\$38,400	\$30,000		\$9,000	\$45,000
		\$1,329,000	\$1,764,474	\$1,856,000	\$1,883,000	\$2,039,000	\$2,368,500

Bid Analysis

- Of the 17 bid items reflected in the Engineer's Estimate majority of the bid items were underestimated
- Range of differences varied from \$2,800 to \$167,774
- Several items were over by up to -\$64,100
- Largest differences were in Material Storage Building, Vactor Pit, Grading, and site paving
- Electrical costs were noted to be shown included in bid item 10 instead of 9 in estimate versus bid. Totals for these bid items combined are close
- Largest four differences were analyzed in additional detail

Bid Item	Description	EST	PnP Construction	DIFFERENCE
		Total	Unit \$	
1	Permits and Insurance	\$20,000.00	\$30,000.00	\$10,000.00
2	Mobilization and Demobilization	\$55,000.00	\$50,000.00	(\$5,000.00)
3	Sheeting, Shoring, and Bracing	\$10,000.00	\$5,100.00	(\$4,900.00)
4	SWPPP Implementation	\$30,000.00	\$11,300.00	(\$18,700.00)
5	Demolition and Abandonment	\$20,400.00	\$45,200.00	\$24,800.00
6	Site Grading	\$32,200.00	\$85,000.00	\$52,800.00
7	Site Pavement and Striping	\$227,200.00	\$257,500.00	\$30,300.00
8	Decorative Retaining Wall and Landscaping	\$4,000.00	\$16,200.00	\$12,200.00
9	Perimeter Sound Wall and Motor Operated Gate	\$184,600.00	\$120,500.00	(\$64,100.00)
10	Site Electrical and Control Panel	\$78,000.00	\$153,600.00	\$75,600.00
11	Site Water Distribution Piping	\$21,100.00	\$25,400.00	\$4,300.00
12	Wash and Vactor Pit Drain Sewer System	\$15,100.00	\$22,000.00	\$6,900.00
13	Install New Sewer Pipeline and Install New Manhole connection	\$30,000.00	\$32,800.00	\$2,800.00
14	Site Drainage System	\$42,200.00	\$55,400.00	\$13,200.00
15	Vactor Disposal Pits and Mixing Facility	\$56,300.00	\$122,500.00	\$66,200.00
16	Vehicle Wash Facility	\$134,800.00	\$144,200.00	\$9,400.00
17	Material Storage Facility	\$368,100.00	\$535,874.00	\$167,774.00
18	Winterization/Stabilization of site	\$0.00	\$13,500.00	\$13,500.00
19	Grading for final pavement following winterization	\$0.00	\$38,400.00	\$38,400.00

Probable Reasons for Differences

Better Economy = Increased Construction

Increase in Labor Rates and Demand for Skilled labor

- Increased construction in the area has placed a demand for skilled labor causing labor rates to increase

Equipment Rental Increases

- Increased demand for equipment has driven prices higher

Material Cost Increases

- Increased demand for materials has driven prices higher

Time of Year

- Bidding during the busy season can result in elevated bids from contractors (and their sub-contractors)

Interest Rate/Borrowing Costs

- Added costs for financing materials, equipment and labor prior to start of payments

Comparison

Site Pavement and Striping

- Unit cost for paving was lower than bid
- While the quantity overall for the area is large a discounted rate may not be included in bid

Site Grading

- Unit cost used for grading (\$35/CY) may be too low to account for disposal
- Costs may be due to uncertainty associated with vector pit grading

Vector Pits and Material Storage Facility

- Both facilities use the most concrete – 400 CY for Material Storage and 77 CY for Vector Pits
- Standard unit cost in estimate was \$600 per cubic yard
- PnP noted that they included their “general costs” and overhead in Bid Item 17 – Bid is \$409,092 before including other costs

Overall unit costs and overhead/profit/general costs were lower than bids

BID ITEM	DESCRIPTION	EST	PNP CONSTRUCTION	DIFFERENCE
		TOTAL	UNIT \$	
6	Site Grading	\$32,200.00	\$85,000.00	\$52,800.00
7	Site Pavement and Striping	\$227,200.00	\$257,500.00	\$30,300.00
15	Vector Disposal Pits and Mixing Facility	\$56,300.00	\$122,500.00	\$66,200.00
17	Material Storage Facility	\$368,100.00	\$535,874.00	\$167,774.00
		\$1,329,000.00	\$1,764,474.00	\$435,474.00

Options

Project Options to Consider

- Option 1 – **No Project:** Reject all Bids and Do Not Build the Project (Continue existing operations on the site)
- Option 2 – **Re-Bid Project:** Reject all Bids and Re-Bid Project in Fall/Winter to start in Spring 2018 (One Project, Budgeted over Two Years)
- Option 3 – **Phased Project:** Encumber 2017 Budgeted Project Dollars into 2018 and add additional Budgeted funds for 2019 (Two Projects, Budgeted over Two Years)
- Option 4 – **Build Project Now:** Accept lowest Responsive Bidder (PnP Construction) and complete the Project now

Option 1: No Project

Reject all Bids and Do Not Build the Project (Continue existing operations on the site)

Pros	Cons
Reallocate budget for other projects	Employee safety issues are not addressed
	Increased District Liability – General Liability & Workers' Comp
	Operational efficiency/productivity issues are not addressed
	Environmental compliance issues are not addressed
	Does not address improvement to vehicular circulation and parking problems
	No new perimeter fencing & lighting; does not address safety and security concerns
	Complaints from City are not addressed
	Current Project expenditures become a stranded investment (PTD \$215,000)

Option 2: Re-Bid Project

Reject all Bids and Re-Bid Project in Fall/Winter to start in Spring 2018 (One Project, Budgeted over Two Years)

Pros	Cons
Potential for lower bids, but no guarantee	Further project delays increase chances for employee injury; reduced productivity and lack of environmental compliance; continued increased liability
Bid items for winterization and spring paving can be eliminated (est. \$50,000)	Delays improvement to vehicular circulation and parking problems
Additional project funding can be allocated in 2018 budget	Deferred perimeter fencing & lighting improvements delay addressing safety and security concerns
	Potential to receive higher bids or no bids; difficult to time the construction market
	Uncertain availability of a temporary corporation yard
	Increased costs for rebidding and project management (est. \$50,000)
	Often, project delays result in additional costs
	Impacts District's workload priorities for 2018; large Opportunity Costs
	Project delays implementation of 2017 Strategic Plan; potentially impacts the completion date of other Strategic Planning items (Domino Effect)

Option 3: Phased Project

- Encumber 2017 budget for a 2018 Project – **Phase 1**
- Add additional budget in 2019 for remainder of work – **Phase 2**

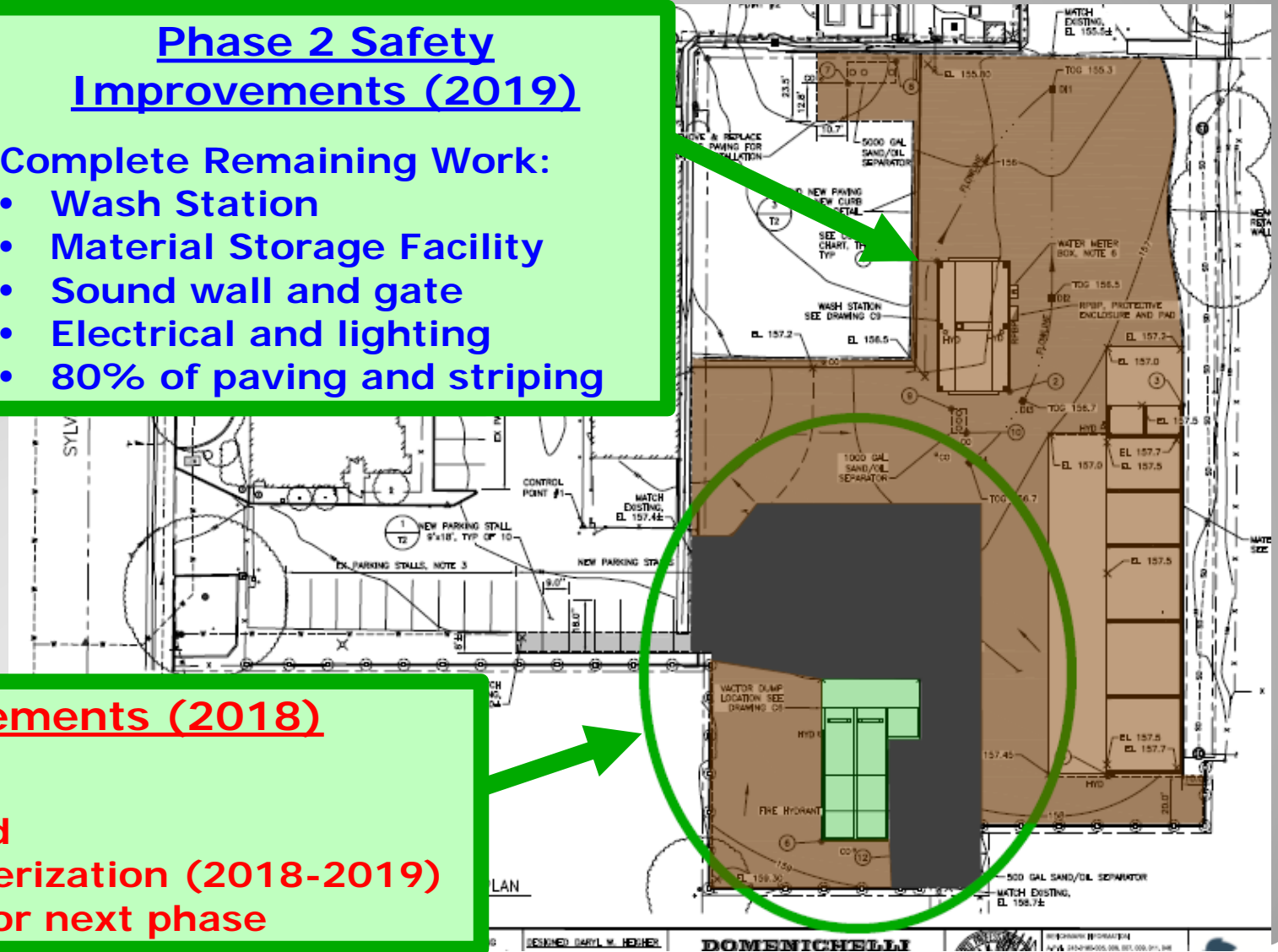
Phase 2 Safety Improvements (2019)

Complete Remaining Work:

- Wash Station
- Material Storage Facility
- Sound wall and gate
- Electrical and lighting
- 80% of paving and striping

Phase 1 Safety Improvements (2018)

- Vector Excavation Pits
- Sewer, Drain, Water Completed
- 20% of paved surface for winterization (2018-2019)
- No significant demo required for next phase



Option 3: Phased Project

Encumber 2017 Budgeted Project Dollars into 2018 and add additional Budgeted funds for 2019 (Two Projects, Budgeted over Two Years)

Pros	Cons
Encumbers 2017 budget allocation (\$1.385M) for 2018 Phase 1 work	Increases the overall Project Cost (est. \$300,000) e.g., Additional engineering costs to revise PS&E; construction costs (mobilization & demobilization)
Additional budget can be requested for 2019 Budget for Phase 2 work	Increased uncertainty of Project Costs; increased inability to control Project Costs
Addresses some safety issues, operational efficiency, and environmental compliance	Requires future budget allocation for Project (with additional costs)
	Potential to receive higher bids or no bids (Unit costs may go up since the project is reduced)
	Phasing may result in a disjointed facility layout/improvements
	Two or more Construction phases; therefore, disruptive to Operations
	Temporary Corporation Yard needed two times; Uncertain availability of a Temporary Corporation Yard
	Large Opportunity Costs; negatively impacts CHWD workload priorities, including Strategic Planning items for 2018/19
	Defers addressing all of the safety problems, operational inefficiencies and environmental compliance issues
	Delays improvement to vehicular circulation and parking problems
	Deferred perimeter fencing & lighting improvements delay addressing safety and security concerns
	Delays Project completion

Option 4: Build Project Now

Accept Lowest Responsive Bidder (PnP Construction) and complete the Project now

Pros	Cons
Project will begin in 2017 as planned; earliest possible Project completion	Requires increase in budget allocation for project during 2017
Safety, productivity, liability, City and environmental compliance issues will be addressed	Construction may extend into the winter months (weather delays)
Eliminates Cost uncertainty of a Re-Bid; most Project Cost certainty of all Project-Build Options	Possibility of receiving lower Bids through Re-Bidding
Reduces/eliminates CHWD's Opportunity Costs; eliminates Domino Effect	
Keeps District on track with 2017 Strategic Plan	
New perimeter fencing addresses security concerns	
Least complex project to implement; eliminates complexity of Re-Bidding or having to manage two separate projects	
Reduces/eliminates the potential for disjointed facility improvements and the problems that can result	
Least disruptive to Operations	
Addresses vehicular circulation and parking problems	
Certainty of Temporary Corporation Yard	
No stranded investments (PTD \$215,000)	

Amending the Project Budget

- **\$1,385,688 – Original Budget – Have stayed within this project budget since the beginning**
- **With a responsive low bid in place, all costs for the project can be considered**
- **Staff as reviewed each line of the budget to prepare one request for an amendment**
- **All future cost considerations were carefully reviewed**
- **Every attempt has been made to make sure enough funding is available to complete the project**
- **Contingencies have been included for all future funding areas**
- **Staff reported that a Project Budget amendment request would occur at the time of the award of contract for construction**

Option Costs

Option	Description	Cost Basis	Total Project Cost
1	No Project	<ul style="list-style-type: none"> To date expenses 	\$215,000
2	Re-Bid Project (2018)	<ul style="list-style-type: none"> Based on Option 4 budget (will change with new bid) Additional staff and project mgt time 	\$2,700,000*
3	Phased Project (2018/19)	<ul style="list-style-type: none"> Based on Option 4 budget (will change with new bids) Added expense estimates for Phase 2 	\$2,927,000*
4	Build Project Now (2017)	<ul style="list-style-type: none"> Additions to scope from original estimate Current Low Bid for Construction Lot mergers, sewer replacement design, SASD easement, tribal coordination, revised contract Yard rental Legal services – Project cost allocation Additional staff time – Project cost allocation 	\$2,632,327

**Costs based on current Low Bid Prices*

Funding Options

Option 2 – Re-Bid	Amount	Funding
Total Project Estimated Cost	\$2,700,000*	<ul style="list-style-type: none"> • \$500,000 Utility Billing • \$300,000 Power Gen • Est. \$514,312 Capital Improvement Reserve (undesignated) 2018 • Alt is to reallocate from other Projects in 2017/18
2017 Budget	<u>\$1,385,688</u>	
Difference	\$1,314,312	
Option 3 – Phased	Amount	Funding
Total Project Estimated Cost	\$2,927,779*	<ul style="list-style-type: none"> • \$500,000 Utility Billing • \$300,000 Power Gen • Est. \$742,091 Capital Improvement Reserve (undesignated) • Alt is to reallocate from other Projects in 2018/19
2017 Budget	<u>\$1,385,688</u>	
Difference	\$1,542,091	
Option 4 – Build Now	Amount	Funding
Total Project Cost	\$2,632,327	<ul style="list-style-type: none"> • \$500,000 Utility Billing • \$300,000 Power Gen • \$446,639 Capital Improvement Reserve (undesignated)
2017 Budget	<u>\$1,385,688</u>	
Difference	\$1,246,639	

**Costs based on current Low Bid Prices*

Funding Sources

Allocation of Funds	Amount	Description
Utility Billing/Finance Software	\$500,000	<ul style="list-style-type: none"> • Possible State mandated water budgets • BPR allowed CHWD to further utilize the capabilities of existing system
Power Generation (From Pressure Control)	\$300,000	<ul style="list-style-type: none"> • Power Generation tied to portion of Pressure Control • SMUD program not moving forward at this time • Cost will be addressed through Project 2030
Capital Improvement Reserve – Undesignated Reserve	\$514,312 (Option 2) \$742,091 (Option 3) \$446,639 (Option 4)	<ul style="list-style-type: none"> • Transfer of funds from the Capital Improvement Reserves • Options 2 & 3 Alt is to reallocate from other Projects in 2017-19
Total	\$1,314,312 (Option 2) \$1,542,091 (Option 3) \$1,246,639 (Option 4)	<ul style="list-style-type: none"> • In addition to 2017 Project Budget allocation of \$1,385,688

Policy Action

Option 1 – No Project

- Motion/Minute Action indicating this option as selected
- Remaining funds transferred to Reserves

Option 2 – Re-Bid Project

- Motion/Minute Action indicating this option as selected
- Encumber \$1,385,688 (2017 budgeted amount)
- Approve Budget Amendment reallocating and encumbering
 - \$500,000 Utility Billing Software
 - \$300,000 Power Generation
- Note – Project budget amendment to fully fund project at time of award of construction contract (2017/18)

Option 3 – Phased Project

- Motion/Minute Action indicating this option as selected
- Encumber \$1,385,688 (2017 budgeted amount)
- Approve Budget Amendment reallocating and encumbering
 - \$500,000 Utility Billing Software
 - \$300,000 Power Generation
- Note – Project budget amendment to fully fund project at time of award of construction contract (2018/19)

Option 4 – Build Now

- Motion/Minute Action indicating this option as selected
- Approve contract with lowest responsive bidder (PnP Construction) & authorize GM to execute, subject to minor modifications by General Counsel
- Approve Contract amendment with Domenichelli & Associates
- Encumber \$1,385,688 (2017 budgeted amount)
- Approve Budget Amendment reallocating and encumbering
 - \$500,000 Utility Billing Software
 - \$300,000 Power Generation
 - \$446,639 Transfer from Capital Improvement Reserve

Recommendation

Option 4 – Build Now/Accept PnP Construction bid

- **Addresses the projects primary goals**
 - Employee Safety
 - Operational Efficiency
 - Security
 - Environmental Compliance
- **Completes project in 2017 as planned**
- **Significantly reduces uncertainty, including unpredictable costs, associated with a Re-Bid or Phasing**
 - Economy continues to grow
 - Material and labor costs continue to rise



Board Questions and Comments

ATTACHMENT 2

Agreement with PnP Construction, Inc.

CORPORATION YARD IMPROVEMENT PROJECT

SPECIFICATIONS FOR PROJECT NO. C15-102



CONSTRUCTION AGREEMENT



**CITRUS
HEIGHTS
WATER
DISTRICT**

6230 Sylvan Rd • PO Box 286
Citrus Heights • California • 95611-0286

916/725-6873 • 916/725-0345 Fax

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**SECTION 00100
NOTICE INVITING BIDS**

NOTICE INVITING BIDS

Citrus Heights Water District ("District") will receive sealed bids only for the Corporation Yard Improvement Project no later than June 28, 2017 at 2:00 pm, at the Administrative Office of Citrus Heights Water District, 6230 Sylvan Road, Citrus Heights, CA 95610, at which time said bids will be read aloud. The District will not accept late bids. Bids shall be valid for 60 calendar days after the bid opening date.

The Project must be completed within **150** calendar days, beginning ten (10) calendar days after the date on which the notice to proceed ("Notice to Proceed") is sent by the District to the contractor that is awarded a bid for this Project ("Contractor").

The Project consists of: In accordance with plans and specifications prepared by Domenichelli & Associates, Inc., the Work includes the furnishing of all labor, materials, tax, equipment and services for the construction and completion of the following work all within the existing District's corporation yard near the intersection of Sylvan Road and Greenback Lane. The work to be completed includes, but is not limited to, constructing a new covered vehicular wash station, two new open vacuum excavation dump pits, replacement of an existing sewer pipeline, connection to an existing sewer pipeline (new manhole), installation of sand-oil separators for the new wash station and vacuum excavation dump pit water; a new covered material storage areas for aggregate base, sand, concrete and asphalt; new water pipelines and connections (with the exception of work to be performed by the District); new storm drain pipe and site drainage improvements including a sand-oil separator; new pavement and striping; concrete perimeter security wall and automated access gate, and all site electrical and lighting.

Contract Documents, Plans, and Specifications are now posted on the Citrus Heights Water District Plan Room website at <http://chwdplanroom.com/>. Citrus Heights Water District will be using California Surveying and Drafting Supply to manage the Plan Room and distribute all Contract Documents, Plans, and Specifications. The entire bid package including plans and any District issued amendments can be ordered at the expense of the Contractor through the Plan Room website or by calling California Surveying and Drafting Supply at (916) 344-0232, 4733 Auburn Blvd, Sacramento, CA 95841

Amendments or changes to the Contract Documents, Plans and Specifications prior to the date and time specified of the opening of bids will be performed and validated in writing and distributed by the District to the plan holders of record.

Complete sets of the Bid Forms must be used in preparing bids. The District does not assume responsibility for errors or misinterpretations resulting from the use of incomplete

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NOTICE INVITING BIDS**

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sets of Contract Documents. Modifications to or withdrawal of bids may be made by the bidder prior to the bid closing deadline. Bids must be accompanied by cash, a certified or cashier's check, or a Bid Bond in favor of the District in an amount not less than (10%) of the submitted Total Bid Price.

A full set of the Contract Documents are also available for examination at the Engineer's office – Domenichelli and Associates, Inc, 1101 Investment Blvd., Suite 115, El Dorado Hills CA 95762, 916-933-1997.

Any Bidder may visit the District offices at the time set for bid submission and request a reading of the bids. However, bid results are automatically made public in the bid management system upon bid closing. District reserves the right to reject any or all Bids and to waive any informality or irregularity in any Bid.

A MANDATORY Pre-Bid Conference will be held at **6230 Sylvan Road, Citrus Heights, CA 95611** on the following date(s) and time(s): June 14, 2017 at 10AM. Each and every Bidder MUST attend the Pre-Bid Conference. Other than Public Right of Way, Prospective bidders MAY NOT visit the Project Site without making arrangements through the District. Bids WILL NOT be accepted from any bidder who did not attend the Mandatory Pre-Bid Conference.

The District's preliminary cost estimate for this Project is \$1,200,000.00

Each bid shall be accompanied by the security referred to in the Contract Documents, the non-collusion affidavit, the list of proposed subcontractors, and all additional documentation required by the Instructions to Bidders.

The successful bidder will be required to furnish the District with a Performance Bond equal to 100% of the successful bid, and a Payment Bond equal to 100% of the successful bid, prior to execution of the Contract. All bonds are to be secured from a surety that meets all of the State of California bonding requirements, as defined in Code of Civil Procedure Section 995.120, and is admitted by the State of California.

Pursuant to Public Contract Code Section 22300, the successful bidder may substitute certain securities for funds withheld by District to ensure his performance under the Contract.

The Director of Industrial Relations has determined the general prevailing rate of per diem wages in the locality in which this work is to be performed for each craft or type of worker needed to execute the Contract which will be awarded to the successful bidder, copies of which are on file and will be made available to any interested party upon request at the District's offices, 6230 Sylvan Road, Citrus Heights, California 95610, or online at <http://www.dir.ca.gov/dlsr>. A copy of these rates shall be posted by the successful bidder at the job site. The successful bidder and all subcontractor(s) under him, shall comply

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with all applicable Labor Code provisions, which include, but are not limited to the payment of not less than the required prevailing rates to all workers employed by them in the execution of the Contract, the employment of apprentices, the hours of labor and the debarment of contractors and subcontractors.

All contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work. This Project will be subject to compliance monitoring and enforcement by the Department of Industrial Relations.

Each bidder shall be a licensed contractor pursuant to the Business and Professions Code and shall be licensed in the following appropriate classification(s) of contractor's license(s), for the work bid upon, and must maintain the license(s) throughout the duration of the Contract:

California Class A General Engineering Contractor.

This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. In bidding on this project, it shall be the Bidder's sole responsibility to evaluate and include the cost of complying with all labor compliance requirements under this contract and applicable law in its bid.

Award of Contract: The District shall award the Contract for the Project to the lowest responsible bidder as determined from the Base Bid by the District. The District reserves the right to reject any or all bids or to waive any irregularities or informalities in any bids or in the bidding process.

The District reserves the right to reject any or all bids or to accept any bid. The District reserves the right to determine which proposal is, in its judgment, the most responsive bid of a responsible bidder and which proposal should be accepted in the best interest of the District. The District also reserves the right to waive any informality in any proposal or bid.

For further information, contact Paul Dietrich at 916-735-7723 or via e-mail (pauld@chwd.org).

END OF NOTICE INVITING BIDS

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SECTION 00200
INSTRUCTIONS TO BIDDERS

INSTRUCTIONS TO BIDDERS

1. AVAILABILITY OF CONTRACT DOCUMENTS

Bids must be submitted to the District on the Bid Documents which are a part of the Bid Package for the Project. Prospective bidders may obtain a complete set of Contract Documents as stated in the Notice Inviting Bids.

2. EXAMINATION OF CONTRACT DOCUMENTS

The District has made copies of the Contract Documents available, as indicated above. Bidders shall be solely responsible for examining the Project Site and the Contract Documents, including any Addenda issued during the bidding period, and for informing itself with respect to local labor availability, means of transportation, necessity for security, laws and codes, local permit requirements, wage scales, local tax structure, contractors' licensing requirements, availability of required insurance, and other factors that could affect the Work. Bidders are responsible for consulting the standards referenced in the Contract. Failure of Bidder to so examine and inform itself shall be at its sole risk, and no relief for error or omission will be given except as required under State law.

3. INTERPRETATION OF CONTRACT DOCUMENTS

Discrepancies in, and/or omissions from the Plans, Specifications or other Contract Documents or questions as to their meaning shall be immediately brought to the attention of the District by submission of a written request for an interpretation or correction to the District. Such submission, if any, must be sent via email, U.S. Mail or facsimile to:

Sara Rogers, P.E.
Domenichelli and Associates, Inc.
1101 Investment Blvd., Suite 115
El Dorado Hills, CA 957262
Facsimile: 916-933-4778
e-mail:sara@daengineering.net

and received no later than June 21, 2017 by 5:00PM.

Any interpretation of the Contract Documents will be made only by written addenda duly issued and provided to all recipients of complete sets of the Contract Documents. The District will not be responsible for any explanations or interpretations provided in any other manner. No person is authorized to make any oral interpretation of any provision in the Contract Documents to any Bidder, and no Bidder should rely on any such oral interpretation.

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Bids shall include complete compensation for all items of work to be performed under the Contract Documents.

4. INSPECTION OF SITE; PRE-BID CONFERENCE AND SITE WALK

Each prospective bidder is responsible for fully acquainting itself with the conditions of the Project Site, as well as those relating to the construction and labor of the Project, to fully understand the facilities, difficulties and restrictions which may impact the cost or effort required to complete the Project. To this end, a Pre-Bid Conference and Site Walk will be held on the date(s) and time(s) indicated in the Notice Inviting Bids.

5. ADDENDA

The District reserves the right to revise the Contract Documents prior to the bid opening date. Revisions, if any, shall be made by issuing Addenda. All plan holders will be notified when an addendum is posted to the bid management system. All addenda issued by the District shall be included in the bid and made part of the Contract Documents. Pursuant to Public Contract Code Section 4104.5, if the District issues an Addendum which includes material changes to the Project less than 72 hours prior to the deadline for submission of bids, the District will extend the deadline for submission of bids. The District may determine, in its sole discretion, whether an Addendum warrants postponement of the bid submission date. Announcement of any extension shall be made via the electronic bid management system to all plan holders. Please Note: Bidders are responsible for ensuring that they have received any and all Addenda. To this end, the electronic bid management system requires each bidder acknowledge receipt of all addenda before submission of the bid.

6. ALTERNATE BIDS

If alternate bid items are called for in the Contract Documents, the lowest bid will be determined on the basis of the base bid only, unless otherwise specified in the notice Inviting Bids. The time required for completion of the alternate bid items has been factored into the Contract Time and no additional time will be awarded for any of the alternate bid items. The District may elect to include one or more of the alternate bid items, or to otherwise remove certain work from the Project scope of work, accordingly each Bidder must ensure that each bid item contains a proportionate share of profit, overhead and other costs or expenses which will be incurred by the Bidder.

7. COMPLETION OF BID FORMS

Bids shall only be prepared using copies of the Bid Forms which are included in the Contract Documents. The use of substitute bid forms will not be permitted. Bids shall be executed by an authorized signatory as described in these Instructions to Bidders. Deviations in the bid form may result in the bid being deemed non-responsive.

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8. MODIFICATIONS OF BIDS

Each Bidder shall submit its Bid in strict conformity with the requirements of the Contract Documents. Unauthorized additions, modifications, revisions, conditions, limitations, exclusions or provisions attached to a Bid may render it non-responsive and may cause its rejection. Bidders shall neither delete, modify, nor supplement the printed matter on the Bid Forms, nor make substitutions thereon. Oral, telephonic and electronic modifications will not be considered, unless the Notice Inviting Bids authorizes the submission of electronic bids and modifications thereto and such modifications are made in accordance with the Notice Inviting Bids.

9. DESIGNATION OF SUBCONTRACTORS

Pursuant to State law, the Bidders must designate the name and location of each subcontractor who will perform work or render services for the Bidder in an amount that exceeds one-half of one percent (1/2%) of the Bidder's Total Bid Price, as well as the portion of work each such subcontractor will perform on the form provided herein by the District. No additional time will be provided to bidders to submit any of the requested information in the Designation of Subcontractor form.

10. LICENSING REQUIREMENTS

Pursuant to Section 7028.15 of the Business and Professions Code and Section 3300 of the Public Contract Code, all bidders must possess proper licenses for performance of this Contract. Subcontractors must possess the appropriate licenses for each specialty subcontracted. Pursuant to Section 7028.5 of the Business and Professions Code, the District shall consider any bid submitted by a contractor not currently licensed in accordance with state law and pursuant to the requirements found in the Contract Documents to be nonresponsive, and the District shall reject the Bid. The District shall have the right to request, and Bidders shall provide within five (5) calendar days, evidence satisfactory to the District of all valid license(s) currently held by that Bidder and each of the Bidder's subcontractors, before awarding the Contract.

Notwithstanding anything contained herein, if the Work involves federal funds, the Contractor shall be properly licensed by the time the Contract is awarded, pursuant to the provisions of Public Contract Code Section 20103.5.

11. SIGNING OF BIDS

All Bids submitted shall be executed by the Bidder or its authorized representative. s. Bidders may be asked to provide evidence in the form of an authenticated resolution of its Board of Directors or a Power of Attorney evidencing the capacity of the person signing the Bid to bind the Bidder to each Bid and to any Contract arising therefrom. Hard copy of bids shall be submitted at the District's offices.

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If a Bidder is a joint venture or partnership, it may be asked to submit an authenticated Power of Attorney executed by each joint venturer or partner appointing and designating one of the joint venturers or partners as a management sponsor to execute the Bid on behalf of Bidder. Only that joint venturer or partner shall execute the Bid. The Power of Attorney shall also: (1) authorize that particular joint venturer or partner to act for and bind Bidder in all matters relating to the Bid; and (2) provide that each venturer or partner shall be jointly and severally liable for any and all of the duties and obligations of Bidder assumed under the Bid and under any Contract arising therefrom. The Bid shall be executed by the designated joint venturer or partner on behalf of the joint venture or partnership in its legal name.

12. BID GUARANTEE (BOND)

Each bid shall be accompanied by: (a) cash; (b) a certified check made payable to the District; (c) a cashier's check made payable to the District; or (d) a bid bond payable to the District executed by the bidder as principal and surety as obligor in an amount not less than 10% of the maximum amount of the bid. Personal sureties and unregistered surety companies are unacceptable. The surety insurer shall be California admitted surety insurer, as defined in Code of Civil Procedure Section 995.120. The cash, check or bid bond shall be given as a guarantee that the bidder shall execute the Contract if it be awarded to the bidder, shall provide the payment and performance bonds and insurance certificates and endorsements as required herein within ten (10) calendar days after notification of the intent to award the Contract to the bidder. Failure to provide the required documents may result in forfeiture of the bidder's bid deposit or bond to the District and the District may award the Contract to the next lowest responsible bidder, or may call for new bids.

13. SUBMISSION OF SEALED BIDS

Bidders shall submit hard copies of their bids pursuant to Public Contract Code Sections 1600 and 1601. The acceptable method(s) of submission are stated in the Notice Inviting Bids. District shall not accept bids otherwise transmitted. **No oral, telephonic, or facsimile bids will be considered.**

14. DELIVERY AND OPENING OF BIDS

Bids will be received by the District up to the date and time shown in the Notice Inviting Bids. It is the Bidder's sole responsibility to ensure that its Bid is received as specified. Bids may be submitted earlier than the dates(s) and time(s) indicated.

Bids will be opened at the date and time stated in the Notice Inviting Bids, and the amount of each Bid will be read aloud and recorded. All Bidders may, if they desire, attend the opening of Bids. The District may in its sole discretion, elect to postpone the opening of the submitted Bids. District reserves the right to reject any or all Bids and to waive any

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informality or irregularity in any Bid. In the event of a discrepancy between the written amount of the Bid Price and the numerical amount of the Bid Price, the written amount shall govern.

15. WITHDRAWAL OF BID

Prior to the bid closing deadline, a Bid may be electronically withdrawn by the Bidder. Any request to withdraw a bid after bid opening must be made in accordance with Public Contract Code section 5100 *et seq.* and must be submitted in writing within five (5) working days, excluding Saturday, Sundays and State holidays, specifying in detail how the mistake was made.

16. BASIS OF AWARD; BALANCED BIDS

The District shall award the Contract to the lowest responsible Bidder submitting a responsive Bid. The District may reject any Bid which, in its opinion when compared to other bids received or to the District's internal estimates, does not accurately reflect the cost to perform the Work. The District may reject as non-responsive any bid which unevenly weights or allocates costs, including but not limited to overhead and profit to one or more particular bid items.

17. DISQUALIFICATION OF BIDDERS; INTEREST IN MORE THAN ONE BID

No bidder shall be allowed to make, submit or be interested in more than one bid. However, a person, firm, corporation or other entity that has submitted a sub-proposal to a bidder, or that has quoted prices of materials to a bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other bidders submitting a bid to the District. No person, firm, corporation, or other entity may submit sub-proposal to a bidder, or quote prices of materials to a bidder, when also submitting a prime bid on the same Project.

18. INSURANCE REQUIREMENTS

The successful bidder shall procure the insurance in the form and in the amount specified in the Contract Documents.

19. AWARD PROCESS

Once all Bids are opened and reviewed to determine the lowest responsive and responsible Bidder, the District may award the contract, or reject all bids. The apparent successful Bidder should begin to prepare the following documents: (1) the Performance Bond; (2) the Payment Bond; and (3) the required insurance certificates and endorsements. Once the District notifies the Bidder of the intent to award, the Bidder will

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have ten (10) consecutive calendar days from the date of this notification to execute the Contract and supply the District with all of the required documents and certifications. Regardless whether the Bidder supplies the required documents and certifications in a timely manner, the Contract time will begin to run ten (10) calendar days from the date of the notification. Once the District receives all of the properly drafted and executed documents and certifications from the Bidder, the District shall issue a Notice to Proceed to that Bidder.

20. FILING OF BID PROTESTS

Any bid protest relating to the form or content of the Bid or Contract Documents must be submitted in writing via the electronic bid management system at least ten (10) business days before the original date set for the bid opening. Any bidder who submits a bid without making a protest shall be deemed to have waived any objection to the form or content of the Bid or Contract Documents not previously stated in writing.

Submitted bids will be timely made available for review upon written request of any bidder.

Bidders may file a “protest” of a Bid with the District’s General Manager. In order for a Bidder’s protest to be considered valid, the protest must:

- A. Be filed in writing not later than 5:00 p.m. on the fifth business day after the bid opening date;
- B. Clearly identify the specific irregularity or basis for the protest;;
- C. Specify, in detail, the factual and legal grounds for the protest; and
- D. Include all relevant supporting documentation with the protest at time of filing.

If the protest does not meet all of these requirements, the District may reject it without further review.

If the protest is timely and complies with all of the above requirements, the District’s General Manger, or other designated District staff or representative, shall review the protest, any response from the challenged bidder, and all other relevant information. The District will provide a written response to the protestor.

The procedure and time limits set forth in this section are mandatory and are the sole and exclusive remedy in the event of a bid protest. Failure to comply with these procedures shall constitute a failure to exhaust administrative remedies and a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.

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21. WORKERS COMPENSATION

Each bidder shall submit the Contractor's Certificate Regarding Workers' Compensation form.

22. RETENTION AND SUBSTITUTION OF SECURITY

The Contract Documents call for monthly progress payments based upon the percentage of the work completed. Unless the District has made findings pursuant to Public Contract Code section 7201 (that the work included in this Contract is substantially complex, and therefore a retention of 10% shall be withheld from each progress payment as provided by the Contract Documents), the District will retain five percent (5%) of each progress payment as provided by the Contract Documents. At the request and expense of the successful Bidder, the District will substitute securities for the amount so retained in accordance with Public Contract Code Section 22300.

23. PREVAILING WAGES

The District has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages in the locality in which this work is to be performed for each craft or type of worker needed to execute the Contract. These rates are on file and available at the District's offices, 6230 Sylvan Road, Citrus Heights, California 95610, or may be obtained online at <http://www.dir.ca.gov/dlsr>. Bidders are advised that a copy of these rates must be posted by the successful Bidder at the job site(s).

If the Work involves federal funds or otherwise requires compliance with the Davis-Bacon Fair Labor Standards Act, the Contractor and all its subcontractors shall pay the higher of the state or federal prevailing wage rates.

24. DEBARMENT OF CONTRACTORS AND SUBCONTRACTORS

In accordance with the provisions of the Labor Code, contractors or subcontractors may not perform work on a public works project with a subcontractor who is ineligible to perform work on a public project pursuant to Section 1777.1 or Section 1777.7 of the Labor Code. Any contract on a public works project entered into between a contractor and a debarred subcontractor is void as a matter of law. A debarred subcontractor may not receive any public money for performing work as a subcontractor on a public works contract. Any public money that is paid to a debarred subcontractor by the Contractor for the Project shall be returned to the District. The Contractor shall be responsible for the payment of wages to workers of a debarred subcontractor who has been allowed to work on the Project.

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**SECTION 00200
INSTRUCTIONS TO BIDDERS**

25. IRAN CONTRACTING ACT CERTIFICATION

Each bidder shall submit the certification required by the Iran Contracting Act of 2010, Public Contract Code section 2200 *et seq.* with its bid. The certification is included in the Contract Documents.

26. PERFORMANCE BOND AND PAYMENT BOND REQUIREMENTS

Within the time specified in the Contract Documents, the Bidder to whom a Contract is awarded shall deliver to the District four identical counterparts of the Performance Bond and Payment Bond in the form supplied by the District and included in the Contract Documents. Failure to do so may, in the sole discretion of District, result in the forfeiture of the Bid Guarantee. The surety supplying the bond must be an admitted surety insurer, as defined in Code of Civil Procedure Section 995.120, authorized to do business as such in the State of California and satisfactory to the District. The Performance Bond and the Payment Bond shall be for one hundred percent (100%) of the Total Bid Price.

27. REQUEST FOR SUBSTITUTIONS

The successful bidder shall comply with the substitution request provisions set forth in the Special Conditions, including any deadlines for substitution requests **which may occur prior to the bid opening date.**

28. SALES AND OTHER APPLICABLE TAXES, PERMITS, LICENSES AND FEES

Contractor and its subcontractors performing work under this Contract will be required to pay California sales tax and other applicable taxes, and to pay for permits, licenses and fees required by the agencies with authority in the jurisdiction in which the work will be located, unless otherwise expressly provided by the Contract Documents. Bidders shall include all applicable taxes and fees that are in effect or reasonably anticipated on the bid date in their bid price.

29. EXECUTION OF CONTRACT

As required herein, the Bidder to whom an award is made shall execute two identical counterparts of the Contract in the amount determined by the Contract Documents. The District may require appropriate evidence that the persons executing the Contract are duly empowered to do so.

END OF INSTRUCTIONS TO BIDDERS

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INSTRUCTIONS TO BIDDERS**

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**SECTION 00400
 BID FORM**

BID FORM

NAME OF BIDDER: PNP Construction, Inc.

The undersigned, hereby declare that we have carefully examined the location of the proposed Work, and have read and examined the Contract Documents, including all plans, specifications, and all addenda, if any, for the following Project:

CORPORATION YARD IMPROVEMENTS PROJECT

We hereby propose to furnish all labor, materials, equipment, tools, transportation, and services, and to discharge all duties and obligations necessary and required to perform and complete the Project in strict accordance with the Contract Documents for the TOTAL BID PRICE.

In the event the bid schedule requires unit pricing, final payment shall be determined by the District from measured quantities of work performed based upon the unit price.

Bid Item	Description	Quantity	Units	Unit Cost	Price
1	Permits and Insurance	1	LS		+30,000 -
2	Mobilization and Demobilization	1	LS		+50,000 -
3	Sheeting, Shoring, and Bracing	1	LS		+5,100 -
4	SWPPP Implementation	1	LS		+11,300 -
5	Demolition and Abandonment	1	LS		+45,200 -
	Site Work				—
6	Site Grading	1	LS		+85,000 -
7	Site Pavement and Striping	1	LS		+257,500 -
8	Decorative Retaining Wall and Landscaping	1	LS		+10,200 -
9	Perimeter Sound Wall and Motor Operated Gate	1	LS		+120,500 -
10	Site Electrical and Control Panel	1	LS		+153,000 -
11	Site Water Distribution Piping	1	LS		+25,400 -
12	Wash and Vector Pit Drain Sewer System	1	LS		+22,000 -
13	Install New Sewer Pipeline and Install New Manhole connection	1	LS		+72,800 -

**SECTION 00400
 BID FORM**

**SECTION 00400
BID FORM**

14	Site Drainage System	1	LS		\$65,400 -
	Facilities				—
15	Vactor Disposal Pits and Mixing Facility	1	LS		\$122,500 -
16	Vehicle Wash Facility	1	LS		\$144,200 -
17	Material Storage Facility	1	LS		\$635,874 -
	Winterization Items				—
18	Winterization/Stabilization of site	1	LS		\$13,500 -
19	Grading for final pavement following winterization	1	LS		\$30,400 -

Bidders must provide pricing for every bid item.

The estimated quantities for unit price items are for purposes of comparing bids only and the District made no representation that the actual quantities of work performed will not vary from the estimates.

In case of discrepancy between the unit price and the line item cost set forth for a unit price item, the line item cost, calculated at the unit price multiplied by the estimated quantity, shall prevail and shall be utilized as the basis for determining the lowest responsive, responsible bidder. However, if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any cause, or is omitted, or is the same amount as the entry in the "Line Item Cost" column, then the amount set forth in the "Line Item Cost" column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price. If any of the above discrepancies exist, the District may recalculate the bid price on the basis of the unit price and the bidder agrees to be bound by such recalculation. Final payment for unit price items shall be determined by the Engineer from measured quantities of work performed based upon the unit price.

TOTAL BID PRICE (BASED ON BID SCHEDULE TOTAL OF UNIT PRICES):

\$ 1,764,474.⁰⁰
Total Bid Price in Numbers

One Million seven hundred sixty four thousand, four hundred seventy four -
Total Bid Price in Written Form

In case of discrepancy between the written price and the numerical price, the written price shall prevail.

**SECTION 00400
BID FORM**

The Contract duration shall commence on the date stated in the District's Notice to Proceed, and shall be completed by the Contractor in the time specified in the Contract Documents. In no case shall the Contractor commence construction prior to the date stated in the District's Notice to Proceed, or before providing the required bonds and evidence of insurance.

Bidder certifies that it is licensed in accordance with the law providing for the registration of Contractors, License No. 806848, Expiration Date 04/30/18, class of license A & B. Bidder certifies that it and all sub-contractors are registered with the Department of Industrial Relations to perform public work, Registration No. 1000004672 (provide DIR for all sub-contractors, separate pages may be attached as needed). If the bidder is a joint venture, each member of the joint venture must include the above information.

The undersigned acknowledges understanding and full consideration of the electronically issued addenda to the Contract Documents.

1. Attached is the required bid security in the amount of not less than 10% of the Total Bid Price.
2. Attached is the fully executed Non-Collusion Declaration form.
3. Attached is the completed Designation of Subcontractors form.
4. Attached is the completed Bidder Information Form.
5. Attached is the completed Iran Contracting Act Certification.
6. Attached is the completed Contractor's Certificate Regarding Workers' Compensation form.

I hereby certify under penalty of perjury under the laws of the State of California, that all of the information submitted in connection with this Bid and all of the representations made herein are true and correct.

Name of Bidder PNP Construction, Inc.

Signature 

Name and Title Shawn Eric Payne, President

Dated 6/28/17

*Bidder or its authorized representative shall upload an electronic scanned copy of the executed Bid Form to the electronic bid management system.

END OF BID FORM

**SECTION 00400
BID FORM**

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SECTION 00400
BID FORM

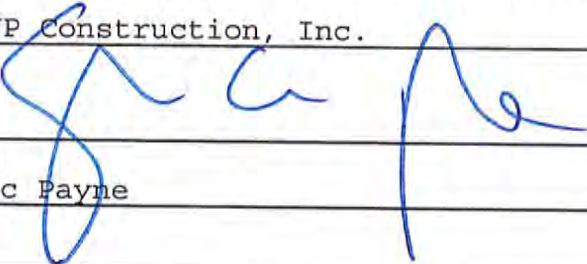
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SECTION 00400
BID FORM
- 16 -

**SECTION 00405
CONTRACTOR'S CERTIFICATE REGARDING WORKERS' COMPENSATION**

CONTRACTOR'S CERTIFICATE REGARDING WORKERS' COMPENSATION

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this Contract.

Name of Bidder PNP Construction, Inc.
Signature 
Name Shawn Eric Payne
Title President
Dated 6/28/17

**END OF CONTRACTOR'S CERTIFICATE REGARDING WORKERS'
COMPENSATION**

**SECTION 00405
CONTRACTOR'S CERTIFICATE REGARDING WORKERS' COMPENSATION**

SECTION 00405
CONTRACTOR'S CERTIFICATE REGARDING WORKERS' COMPENSATION

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SECTION 00405
CONTRACTOR'S CERTIFICATE REGARDING WORKERS' COMPENSATION

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SECTION 00410
BID BOND

BID BOND

The makers of this bond are, PNP Construction, Inc.,
as Principal, and Travelers Casualty and Surety Company of America, as
Surety and are held and firmly bound unto Citrus Heights Water District, hereinafter called
the District, in the penal sum of TEN PERCENT (10%) OF THE TOTAL BID PRICE of the
Principal submitted to District for the work described below, for the payment of which sum
in lawful money of the United States, well and truly to be made, we bind ourselves, our
heirs, executors, administrators, successors and assigns, jointly and severally, firmly by
these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the
Principal has submitted the accompanying bid dated June 28, 2017, for
Corporation Yard Improvement Project, Project #C15-102
(INSERT PROJECT NAME).

If the Principal does not withdraw its bid within the time specified in the
Contract Documents; and if bid is rejected or, in the alternate, the Principal is awarded
the Contract, signs the Contract and provides all documents to the District as required by
the Contract Documents; then this obligation shall be null and void. Otherwise, this bond
will remain in full force and effect and upon default of the Principal shall be forfeited to the
District, it being expressly understood and agreed that the liability of the Surety for any
and all default of the Principal shall be the amount of this obligation as herein stated, as
liquidated damages.

Surety, for value received, hereby stipulates and agrees that no change,
extension of time, alteration or addition to the terms of the Contract Documents shall
affect its obligation under this bond, and Surety does hereby waive notice of any such
changes.

IN WITNESS WHEREOF, the above-bound parties have executed this
instrument under their several seals this 27th day of June, 2017, the name
and corporate seal of each corporation.

(Corporate Seal)

PNP Construction, Inc.
Contractor/Principal

By [Signature]

Title President

Travelers Casualty and Surety Company of America

(Corporate Seal)

Surety

By [Signature]

Attorney-in-Fact

(Attach Attorney-in-Fact Certificate)

Title Karina Palmer, Attorney-in-Fact

SECTION 00410
BID BOND

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

See attached

STATE OF CALIFORNIA
COUNTY OF _____

On _____ 20____, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory

Name(s) of Signer(s)

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

Title(s)

Title or Type of Document

- Partner(s) Limited
- General

Number of Pages

- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

Date of Document

Signer is representing:
Name Of Person(s) Or Entity(ies)

Signer(s) Other Than Named Above

END OF BID BOND

SECTION 00410
BID BOND

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

CIVIL CODE § 1189

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California }
County of Placer }

On June 27, 2017 before me, J. A. Shiroma, Notary Public, personally appeared
Date Here Insert Name and Title of the officer

Karina Palmer
Name(s) of Signer(s)

Who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.



I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: J. A. Shiroma
Signature of Notary Public

* Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: Bidbond Document Date: _____

Number of Pages: _____ Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____

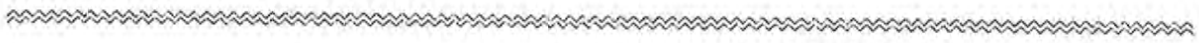
- Corporate Officer--Title(s): _____
- Partner- Limited General
- Individual Attorney in fact
- Trustee Guardian or Conservator
- Other: _____

Signer is Representing: _____

Signer's Name: _____

- Corporate Officer--Title(s): _____
- Partner- Limited General
- Individual Attorney in fact
- Trustee Guardian or Conservator
- Other: _____

Signer is Representing: _____





POWER OF ATTORNEY

Farmington Casualty Company
Fidelity and Guaranty Insurance Company
Fidelity and Guaranty Insurance Underwriters, Inc.
St. Paul Fire and Marine Insurance Company
St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company
Travelers Casualty and Surety Company
Travelers Casualty and Surety Company of America
United States Fidelity and Guaranty Company

Attorney-In Fact No. 232021

Certificate No. 007184018

KNOW ALL MEN BY THESE PRESENTS: That Farmington Casualty Company, St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company are corporations duly organized under the laws of the State of Connecticut, that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of Iowa, and that Fidelity and Guaranty Insurance Underwriters, Inc., is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint

Stephen D. Bender, Edward D. Johnson, Julie A. Shiroma, Karina Palmer, Dona Lisa Buschmann, J. Buschmann, Robert D. Laux, Jana B. Pilgard, and Kathy Rangel

of the City of Roseville, State of California, their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 11th day of April, 2017.

Farmington Casualty Company
Fidelity and Guaranty Insurance Company
Fidelity and Guaranty Insurance Underwriters, Inc.
St. Paul Fire and Marine Insurance Company
St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company
Travelers Casualty and Surety Company
Travelers Casualty and Surety Company of America
United States Fidelity and Guaranty Company



State of Connecticut
City of Hartford ss.

By: [Signature]
Robert L. Raney, Senior Vice President

On this the 11th day of April, 2017, before me personally appeared Robert L. Raney, who acknowledged himself to be the Senior Vice President of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal. My Commission expires the 30th day of June, 2021.



[Signature]
Marie C. Tetreault, Notary Public

**SECTION 00420
NON-COLLUSION DECLARATION**

NON-COLLUSION DECLARATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the President of PNP Construction, Inc., the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on 6/28/17 [date], at Auburn [city], CA [state].



(Signature)

Shawn Eric Payne

(Print Name)

President

(Print Title)

6/28/17

(Date)

END OF NON-COLLUSION DECLARATION

**SECTION 00420
NON-COLLUSION DECLARATION**

JURAT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

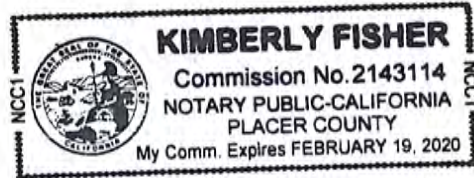
State of California

County of Placer

Subscribed and sworn to (or affirmed) before me on this 28th day of June,
2017 by Shawn Eric Payne

proved to me on the basis of satisfactory evidence to be the person~~s~~ who appeared before me.

Kimberly Fisher
Signature (Seal)



OPTIONAL INFORMATION

DESCRIPTION OF THE ATTACHED DOCUMENT

Citrus Heights Corporation
(Title or description of attached document)

Yard Improvements project
(Title or description of attached document continued)

Noncollision declaration
Number of Pages 24 Document Date 6/28/17

Bidding documents
Additional information

INSTRUCTIONS

The wording of all Jurats completed in California after January 1, 2015 must be in the form as set forth within this Jurat. There are no exceptions. If a Jurat to be completed does not follow this form, the notary must correct the verbiage by using a jurat stamp containing the correct wording or attaching a separate jurat form such as this one which does contain the proper wording. In addition, the notary must require an oath or affirmation from the document signer regarding the truthfulness of the contents of the document. The document must be signed AFTER the oath or affirmation. If the document was previously signed, it must be re-signed in front of the notary public during the jurat process.

- State and county information must be the state and county where the document signer(s) personally appeared before the notary public.
- Date of notarization must be the date the signer(s) personally appeared which must also be the same date the jurat process is completed.
- Print the name(s) of the document signer(s) who personally appear at the time of notarization.
- Signature of the notary public must match the signature on file with the office of the county clerk.
- The notary seal impression must be clear and photographically reproducible. Impression must not cover text or lines. If seal impression smudges, re-seal if a sufficient area permits, otherwise complete a different jurat form.
 - ❖ Additional information is not required but could help to ensure this jurat is not misused or attached to a different document.
 - ❖ Indicate title or type of attached document, number of pages and date.
- Securely attach this document to the signed document with a staple.

**SECTION 00420
NON-COLLUSION DECLARATION**

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**SECTION 00420
NON-COLLUSION DECLARATION**

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**SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM**

6.5 Secretary's Name: Shawn Eric Payne

6.6 Treasurer's Name: Shawn Eric Payne

7.0 If an individual or a partnership, answer the following: **N/A**

7.1 Date of Organization:

7.2 Name and address of all partners (state whether general or limited partnership): **N/A**

8.0 If other than a corporation or partnership, describe organization and name principals: **N/A**

9.0 List other states in which Bidder's organization is legally qualified to do business. **N/A**

10.0 What type of work does the Bidder normally perform with its own forces?

Site work, demolition, concrete and carpentry.

11.0 Has Bidder ever failed to complete any work awarded to it? If so, note when, where, and why:

No

**SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM**

**SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM**

- 12.0 Within the last five years, has any officer or partner of Bidder's organization ever been an officer or partner of another organization when it failed to complete a contract? If so, attach a separate sheet of explanation:

No

- 13.0 List Trade References:

Dan Chancellor Backhoe P. 530/367-2074

Homewood Lumber P. 916/652-4655

Livingston Concrete P. 916/334-4313

Norris Electric P. 530/885-8421

- 14.0 List Bank References (Bank and Branch Address):

First Northern Bank

390 Elm Avenue, Auburn, CA 95603

P. (530) 885-5009

- 15.0 Name of Bonding Company and Name and Address of Agent:

Travelers Casualty & Surety Co. of America

11070 White Rock Road, Suite 130

Rancho Cordova, CA 95670

**SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM**

**SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM**

B. LIST OF CURRENT PROJECTS (Backlog)

[**Duplicate Page if needed for listing additional current projects.**]

Project	Description of Bidder's Work	Completion Date	Cost of Bidder's Work	Contact Name/ Phone Number
Auburn Library Landscape Rehabilitation	New landscaping, irrigation, paths of travel, etc.	11/01/16	\$1,350,000	Bill Lardner P. 530/885-4983

SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM

C. LIST OF COMPLETED PROJECTS - LAST THREE YEARS

[**Duplicate Page if needed for listing additional completed projects.**]

Please include only those projects which are similar enough to demonstrate Bidder's ability to perform the required Work.

Project Client	Description of Bidder's Work	Period of Performance	Cost of Bidder's Work	Contact Name/ Phone Number
Natomas Regional Park	Construction of restroom & concession stand.	150 Days	\$646,779	Jason Wisemann P. 916/808-7634
Sacramento Regional Transit	Stationwide improvements, shelters, railings, benches, etc.	180 Days	\$3,013,839	Darryl Abansado P. 916/321-3876
Del Oro Aquatic & Softball Center	Construction of Olympic size pool & softball field relocation.	210 Days	\$2,710,309	Cody Carpino P. 916/786-8178
PCWA Center Exterior Improvements	Exterior building improvements.	120 Days	\$492,858.68	Dennis Dong P. 916/446-7741

SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM

**SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM**

D. EXPERIENCE AND TECHNICAL QUALIFICATIONS QUESTIONNAIRE

Personnel:

The Bidder shall identify the key personnel to be assigned to this project in a management, construction supervision or engineering capacity.

1. List each person's job title, name and percent of time to be allocated to this project:

Shawn Eric Payne, President

Nathan Peach, Operations Manager

Dave Craig, Superintendent

2. Summarize each person's specialized education:

Shawn Payne: Construction Management with UC Davis

Nathan Peach & Dave Craig: 57 combined years of field
experience.

3. List each person's years of construction experience relevant to the project:

Shawn Payne: 27 years

Nathan Peach: 25 years

Dave Craig: 32 years

4. Summarize such experience:

Public works construction

Bidder agrees that personnel named in this Bid will remain on this Project in their designated capacities until completion of all relevant Work, unless substituted by personnel of equivalent experience and qualifications approved in advance by the District.

**SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM**

Additional Bidder's Statements:

If the Bidder feels that there is additional information which has not been included in the questionnaire above, and which would contribute to the qualification review, it may add that information in a statement here or on an attached sheet, appropriately marked:

E. VERIFICATION AND EXECUTION

These Bid Forms shall be executed only by a duly authorized official of the Bidder:

I declare under penalty of perjury under the laws of the State of California that the foregoing information is true and correct:

Name of Bidder PNP Construction, Inc.

Signature 

Name Shawn Eric Payne

Title President

Dated 6/28/17

END OF CONTRACTOR INFORMATION AND EXPERIENCE FORM

SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM

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SECTION 00430
CONTRACTOR INFORMATION AND EXPERIENCE FORM

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**SECTION 00440
LIST OF SUBCONTRACTORS FORM**

LIST OF SUBCONTRACTORS FORM

In compliance with the Subletting and Subcontracting Fair Practices Act of the Public Contract Code of the State of California, each bidder shall set forth below: (a) the name, contractor's license number and the location of the place of business of and (b) the portion of the work which will be done by each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the work in an amount in excess of one-half of one percent (1/2%) of the Contractor's Total Bid Price. Notwithstanding the foregoing, if the work involves streets and highways, then the Contractor shall list each subcontractor who will perform work or labor or render service to Contractor in or about the work in an amount in excess of one-half of one percent (1/2%) of the Contractor's Total Bid Price or \$10,000, whichever is greater. The District may, within its sole discretion, grant additional time to provide the below requested information.

If no subcontractor is specified for a portion of the Work, or if more than one subcontractor is specified for the same portion of Work, to be performed under the Contract in excess of one-half of one percent (1/2%) of the Contractor's Total Bid Price or \$10,000, whichever is greater, or if the work involves streets or highways, then the Contractor shall be deemed to have agreed that it is fully qualified to perform that Work, and that it shall perform that portion itself.

The completed form shall include a Department of Industrial Relations registration number for all subcontractors. Failure to include a registration number may cause the bid to be non-responsive.

Portion of the Work	Subcontractor	Location of Business	% of the Work	License & Registration Numbers
Sitework	Dan Chancellor	Foresthill, CA	25%	395901 1000048204
Masonry	John D Wait Masonry	Sacramento, CA	1%	38335 100000947
Electrical	Lords Electric	Sacramento, CA	8%	953514 100007932
Fencing	Arrow Fence	Rocklin, CA	1.5%	436008 100002531
Metal Building	LGM	Jackson, CA	9%	773026 100000250

**SECTION 00440
LIST OF SUBCONTRACTORS FORM**

**SECTION 00441
IRAN CONTRACTING ACT CERTIFICATION**

IRAN CONTRACTING ACT CERTIFICATION

(Public Contract Code section 2200 *et seq.*)

As required by California Public Contract Code section 2204, the Contractor certifies subject to penalty for perjury that the option checked below relating to the Contractor's status in regard to the Iran Contracting Act of 2010 (Public Contract Code section 2200 *et seq.*) is true and correct:

- The Contractor is not:
 - (i) identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code section 2203; or
 - (ii) a financial institution that extends, for 45 days or more, credit in the amount of \$20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.
- District has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, District will be unable to obtain the goods and/or services to be provided pursuant to the Contract.
- The amount of the Contract payable to the Contractor for the Work does not exceed \$1,000,000.

Signed _____
Titled President
Firm PNP Construction, Inc.
Date 6/28/17

Note: In accordance with Public Contract Code section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of \$250,000 or twice the Contract Price, termination of the Contract and/or ineligibility to bid on contracts for three years.

END OF IRAN CONTRACTING ACT CERTIFICATION

**SECTION 00441
IRAN CONTRACTING ACT CERTIFICATION**

SECTION 00441
IRAN CONTRACTING ACT CERTIFICATION

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CITRUS HEIGHTS WATER DISTRICT
City of Citrus Heights, California

Bidding Documents
CORPORATION YARD IMPROVEMENTS PROJECT

ADDENDUM NO. 1
Issued June 20, 2017

Bidder's Note: Bidder shall acknowledge receipt and examination of this addendum on the Bid form and attach a signed copy to the Bid, both as required by the Sealed Proposal. See last page of this addendum for signature line of Bidder.

NOTICE

*****Bids are due on **Wednesday, June 28, 2017 at 2:00 p.m.*******

The Bidding Documents are hereby clarified, corrected, and changed as indicated below on Pages 1 through 5, plus attachments.

PRE-BID QUESTIONS:

1. The plan and profile views of the hand rail on the vector pits do not match. Please clarify?
RESPONSE – See changes noted for Drawing Sheet C6 noted below.
2. Does the District have a location where excess dirt can be dumped?
RESPONSE – No. Disposal of all excess dirt and other materials is the sole responsibility of the contractor.
3. Would the District consider having the selected Contractor complete the 12-inch water main work rather than District crews?
RESPONSE – At this time the District intends to complete the water pipeline work as described in the contract documents.
4. Please clarify what work will be done by the District crews on the water line versus the Contractor?
RESPONSE – The District will install the pipeline, valves, backflows, meter, blowoff, hydrants and ARV. The Contractor will be responsible for setting all valve boxes and boxes for other appurtenances and bollards as part of the final paving. Contractor will also be responsible for all 2-inch service pipelines, hose bibs and smaller area hydrants. See contract documents for additional information.
5. Please consider adding a bid item or allowance for winterization of the site and one for regrading of the site for final paving if extended to the next year.
RESPONSE – Bid items will be added for winterization of the site and regrading as necessary if the final paving is extended to 2018. See revised bid sheet and Measurement and Payment descriptions provided below.

6. Is the filter fabric shown on the storm drain detail necessary?
RESPONSE – Storm drain piping shall be installed per Sacramento County standards and as shown on the project plans. No change will be made to the detail at this time.
7. Please clarify where construction joints are required for the Material Storage building? There is a discrepancy between the detail notes and where joints are shown.
RESPONSE – See the revisions to notes on Drawing sheet C7 as noted below.
8. Is there a minimum percentage of work to be performed required for the General Contractor?
RESPONSE – A minimum percentage of work required for the General Contractor versus sub-contractors is not required at this time.
9. What license is required for the project?
RESPONSE – An “A” General Contractor License is required for the project.
10. Please consider removing the requirement for Builder’s Risk insurance. This can be costly.
RESPONSE – Contractor shall provide insurance as required per the contract documents. No changes will be made at this time.
11. The Contract documents state to allow up to 60 days for a Notice to Proceed. Is that correct or can we assume a shorter timeline for this contract?
RESPONSE – The District will recommend award of a contract at the July 11, 2017 Board Meeting. If the contract is approved by the Board a Notice to Proceed will be issued that same week. The Contractor can assume this timeline for this contract in place of the 60 days standard.
12. Please clarify where a construction trailer can be placed, any parking restrictions and if temporary power can be provided by the District?
RESPONSE – The Contractor can place a trailer anywhere within the project area as shown on the plans. No parking or storage of material/equipment will be allowed on the paved areas within the District’s main office site. The District may allow the Contractor to place a trailer within the paved area where a future building is designated. All parking shall be on the street. The Contractor may contact adjacent property owners for additional staging areas as required for the work. Note that the Contractor shall provide a copy of all agreements with property owners and the Contractor shall be responsible for all BMPs and additional SWPPP requirements for any added areas. The Contractor is solely responsible to provide temporary power as needed.
13. Please clarify the site security requirements?
RESPONSE – The Contractor shall secure the site at all times. The Contractor shall ensure that the perimeter of the site is secured during all phases of work.

Contractor shall provide adequate means of securing the site (temporary fencing and added security as necessary).

14. Is the Contractor responsible for any damage to the existing roadway between Greenback and the project site?

RESPONSE – The District currently uses the existing Schuman Lane road for equipment access. It is not anticipated that the Contractor's use of the access road will cause excessive damage. The Contractor shall use best practices to prevent excessive damage. The Contractor is not responsible to make any repairs to the asphalt on Shuman Lane as part of this project.

15. If the project is delayed due to weather or other factors outside of the Contractor's control will the District release retention?

RESPONSE – If significant delays occur that are outside of the Contractor's control and the delays are agreed upon by the Engineer/Construction Manager, the District will consider release of retention for items that are considered 100% complete. The Contractor shall provide a request for release of retention with adequate backup for the District to make a determination.

Changes to Specifications:

Section 01029 Measurement and Payment:

Add the following:

R. Bid Item 18 – WINTERIZATION/STABILIZATION OF SITE

1. Measurement –

- a. This bid item includes all costs for the contractor to winterize and stabilize the site due to excessive weather. This bid item shall include all materials and labor required for the Contractor to maintain the SWPPP through up to six months on non-activity. Prior to demobilizing from the site the Contractor shall stabilize the site through the use of an approved cover (see SWPPP) to minimize the monitoring and maintenance required.
- b. This bid item shall also include any costs associated with demobilization and remobilization for the project including removal and disposal of BMPs used for stabilization and any miscellaneous re-work that may be necessary when starting back up the project the following year.
- c. The quantity for this bid item may change by up to 100%. This bid item will only be utilized if approved in advance by the Construction Manager and the District. The Contractor shall provide a request in advance with justification for delay of project along with the Contractor's plan for stabilization (cover). The request shall provide adequate back-up for delay and final costs.

2. Payment – Winterization/Stabilization will be paid by Lump Sum based on the estimated percentage complete for each as agreed to by the Construction Manager.

S. Bid Item 19 – GRADING FOR FINAL PAVEMENT FOLLOWING

WINTERIZATION

1. Measurement –
 - a. This bid item includes all costs for the contractor to regrade, recompact and/or add material prior to final paving of the site.
 - b. This bid item shall also include any costs associated with demobilization and remobilization for the project final paving including removal and disposal of any damaged or unsuitable materials and any miscellaneous re-work (grading, compacting, etc.) that may be necessary prior to final paving of site the following year.
 - c. The quantity for this bid item may change by up to 100%. This bid item will only be utilized if approved in advance by the Construction Manager and the District. The Contractor shall provide a request in advance with justification for delay of project along with the Contractor's plan for final pavement. The request shall provide adequate back-up for delay and final costs.
2. Payment – Winterization/Stabilization will be paid by Lump Sum based on the estimated percentage complete for each as agreed to by the Construction Manager.

Changes to Drawings:

Drawing C6, Vector Pit Plan Sheet:

1. *Extend the length of the 1-1/2" aluminum railing on both sides of the structure to match Section A on C6.*

Drawing C7, Material Storage Plan Sheet:

1. *Revise the dimension on the right hand side of the page noted as "20'-0" CJ SPACING IN APRON" to "20'-0"*
2. *Add note 3, A construction joint is located at the intersection of each concrete column and wall. Cast columns first and then cast the walls in a checkerboard pattern between.*

Drawing D3, 6-inch Sanitary Sewer – Plan and Profile Sheet:

1. *Replace callout "CONSTRUCT 4'+/- 6" VCP SS LOWER LATERAL PER SASD DTL LL-01A AT 2% SLOPE" with "CONSTRUCT 6'+/- 6" VCP SS LOWER LATERAL PER SASD DTL LL-01A AT 2% SLOPE"*
2. *Replace callout "CONSTRUCT 6" VCP CLEANOUT PER SASD DTL LL-02A 5' OUTSIDE EASEMENT LINE" with "CONSTRUCT 6" VCP CLEANOUT PER SASD DTL LL-02A 3' OUTSIDE EASEMENT LINE"*

Attachments:

Agenda from Mandatory Pre-bid meeting
Sign-in sheet from Mandatory Pre-bid meeting
Updated Bid Form

Citrus Heights Water District,

By: Paul Dietrich
Paul Dietrich, Project Manager

ACKNOWLEDGMENT BY BIDDER,

By: _____

Title: _____

SECTION 00441
IRAN CONTRACTING ACT CERTIFICATION

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SECTION 00441
IRAN CONTRACTING ACT CERTIFICATION

SECTION 00500

CONTRACT

CONTRACT

THIS CONTRACT is made this _____ day of _____, 20___, in the County of Sacramento, State of California, by and between the Citrus Heights Water District, hereinafter called District, and PnP Construction, Inc., hereinafter called Contractor. The District and the Contractor for the considerations stated herein agree as follows:

ARTICLE 1. SCOPE OF WORK. The Contractor shall perform all Work within the time stipulated the Contract and shall provide all labor, materials, equipment, tools, utility services, and transportation to complete all of the Work required in strict compliance with the Contract Documents as specified in Article 5 below for the following Project:

Corporation Yard Improvement Project

The Contractor and its surety shall be liable to the District for any damages arising as a result of the Contractor's failure to comply with this obligation.

ARTICLE 2. TIME FOR COMPLETION. Time is of the essence in the performance of the Work. The Work shall be commenced on the date stated in the District's Notice to Proceed. The Contractor shall complete all Work required by the Contract Documents within **150** calendar days from the commencement date stated in the Notice to Proceed, herein after the Contract Time. By its signature hereunder, Contractor agrees the Contract Time for completion set forth above is adequate and reasonable to complete the Work.

ARTICLE 3. CONTRACT PRICE. The District shall pay to the Contractor as full compensation for the performance of the Contract, subject to any additions or deductions as provided in the Contract Documents, and including all applicable taxes and costs, the sum of one million seven hundred sixty four thousand, four hundred seventy fours dollars (\$1,764,474.00), hereinafter the Contract Price. Payment shall be made as set forth in the General Conditions.

ARTICLE 4. LIQUIDATED DAMAGES. The Contractor acknowledges that the District will sustain actual damages for each and every day completion of the Project is delayed beyond the Contract Time. Because of the nature of the Project, it would be impracticable or extremely difficult to determine the District's actual damages. Accordingly, as provided in Government Code section 53069.85, it is agreed that the Contractor will pay the District the sum of **\$500** for each and every calendar day of delay in completing the Work beyond the time prescribed in the Contract Documents for finishing the Work, as Liquidated Damages and not as a penalty or forfeiture. In the event the Liquidated Damages are not paid, the Contractor agrees the District may deduct that amount from any money due or

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that may become due the Contractor under the Contract. This Article does not affect the District's rights to other damages or remedies specified in the Contract Documents or allowed by law.

Should Contractor be inexcusably delayed in the performance of the Work, District may deduct Liquidated Damages based on its estimate of when Contractor will achieve Final Completion or other milestones. District need not wait until Final Completion to withhold Liquidated Damages from Contractor.

Liquidated Damages are not a penalty but an agreed upon estimate of the actual damages that would be sustained by the District for delay, including but not limited to loss of revenue, inconvenience to the District and the public, and increased Project administration expenses, such as extra inspection, construction management, staff time and architectural and engineering expenses. Liquidated Damages do not include actual damages the District incurs on account of claims by third parties against the District on account of any delay.

Should money due or to become due to the Contractor be insufficient to cover Liquidated Damages or other offsets due, then Contractor forthwith shall pay the remainder of the assessed liquidated damages to District.

ARTICLE 5. COMPONENT PARTS OF THE CONTRACT. The "Contract Documents" include the following documents, each of which is incorporated into this Contract by reference:

- Notice Inviting Bids
- Instructions to Bidders
- Bid Form
- Contractor's Certificate Regarding Workers' Compensation Bid Bond
- Non-Collusion Declaration form
- Contractor Information and Experience Form
- List of Subcontractors Form
- Iran Contracting Act Certification
- Contract
- Performance Bond
- Payment Bond
- Environmental documents and approvals
- General Conditions
- Special Conditions
- Technical Specifications (including Appendices)

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CONTRACT

- Addenda
- Plans and Drawings
- Approved and fully executed change orders
- Federal Requirements
- Standard Specifications for Public Works Construction (Greenbook), most current Edition, except Sections 1-9
- Any other documents contained in or incorporated into the Contract

The Contactor shall complete the Work in strict accordance with all of the Contract Documents.

All of the Contract Documents are intended to be complementary. Work required by one of the Contract Documents and not by others shall be done as if required by all. This Contract shall supersede any prior agreement of the parties.

ARTICLE 6. PROVISIONS REQUIRED BY LAW. Each and every provision of law required to be included in these Contract Documents shall be deemed to be included in these Contract Documents. The Contractor shall comply with all requirements of applicable federal, state and local laws, rules and regulations, including but not limited to, the provisions of the California Labor Code and Public Contract Code applicable to this Project.

If the Work involves federal funds, the Contractor and all its subcontractors shall comply with all requirements set forth in the attached Federal Requirements.

ARTICLE 7. INDEMNIFICATION. Contractor shall provide indemnification as set forth in the General Conditions.

ARTICLE 8. PREVAILING WAGES. Contractor shall be required to pay the prevailing rate of wages in accordance with the Labor Code which such rates shall be made available at the District's offices, 6230 Sylvan Road, Citrus Heights, California 95610, or may be obtained online at <http://www.dir.ca.gov/dlsr>. and which must be posted at the job site.

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CONTRACT

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CONTRACT**

IN WITNESS WHEREOF, this Contract has been duly executed by the above-named parties, on the day and year above written.

<u>[NAME OF CONTRACTOR]</u>	CITRUS HEIGHTS WATER DISTRICT
By _____	By _____
Name and Title: _____	Name and Title: _____
License No. _____	
DIR Registration No. _____	

END OF CONTRACT

**SECTION 00500
CONTRACT**

**SECTION 00610
PERFORMANCE BOND**

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, the Citrus Heights Water District (hereinafter referred to as "District") has awarded to _____, (hereinafter referred to as the "Contractor") _____ an agreement for _____ (hereinafter referred to as the "Project").

WHEREAS, the work to be performed by the Contractor is more particularly set forth in the Contract Documents for the Project dated _____, (hereinafter referred to as "Contract Documents"), the terms and conditions of which are expressly incorporated herein by reference; and

WHEREAS, the Contractor is required by said Contract Documents to perform the terms thereof and to furnish a bond for the faithful performance of said Contract Documents.

NOW, THEREFORE, we, _____, the undersigned Contractor and _____ as Surety, a corporation organized and duly authorized to transact business under the laws of the State of California, are held and firmly bound unto the District in the sum of _____ DOLLARS, (\$ _____), said sum being not less than one hundred percent (100%) of the total amount of the Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Contractor, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract Documents and any alteration thereof made as therein provided, on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill all obligations including the one-year guarantee of all materials and workmanship; and shall indemnify and save harmless the District, its officers and agents, as stipulated in said Contract Documents, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a condition precedent to the satisfactory completion of the Contract Documents, unless otherwise provided for in the Contract Documents, the above obligation shall hold good for a period of one (1) year after the acceptance of the work by District, during which time if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the District from loss or damage resulting from or caused by defective materials or faulty workmanship, Surety shall undertake and faithfully fulfill all such obligations. The obligations of Surety hereunder shall continue so long as any

**SECTION 00610
PERFORMANCE BOND**

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obligation of Contractor remains. Nothing herein shall limit the District's rights or the Contractor or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

Whenever Contractor shall be, and is declared by the District to be, in default under the Contract Documents, the Surety shall remedy the default pursuant to the Contract Documents, or shall promptly, at the District's option:

- (1) Take over and complete the Project in accordance with all terms and conditions in the Contract Documents; or
- (2) Obtain a bid or bids for completing the Project in accordance with all terms and conditions in the Contract Documents and upon determination by Surety of the lowest responsive and responsible bidder, arrange for a Contract between such bidder, the Surety and the District, and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the District under the Contract and any modification thereto, less any amount previously paid by the District to the Contractor and any other set offs pursuant to the Contract Documents.
- (3) Permit the District to complete the Project in any manner consistent with local, California and federal law and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the District under the Contract and any modification thereto, less any amount previously paid by the District to the Contractor and any other set offs pursuant to the Contract Documents.

Surety expressly agrees that the District may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Contractor.

Surety shall not utilize Contractor in completing the Project nor shall Surety accept a bid from Contractor for completion of the Project if the District, when declaring the Contractor in default, notifies Surety of the District's objection to Contractor's further participation in the completion of the Project.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project to be performed thereunder shall in any way affect its obligations on this bond,

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and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project, including but not limited to the provisions of sections 2819 and 2845 of the California Civil Code.

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PERFORMANCE BOND

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**SECTION 00610
PERFORMANCE BOND**

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20__).

(Corporate Seal)

Contractor/ Principal

By _____

Title _____

(Corporate Seal)

Surety

By _____

Attorney-in-Fact

Signatures of those signing for the Contractor and Surety must be notarized and evidence of corporate authority attached.

(Attach Attorney-in-Fact Certificate)

Title _____

The rate of premium on this bond is _____ per thousand. The total amount of premium charges, \$_____.

(The above must be filled in by corporate attorney.)

THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety)

(Name and Address of Agent or Representative for service of process in California, if different from above)

(Telephone number of Surety and Agent or Representative for service of process in California)

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PERFORMANCE BOND**

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**SECTION 00620
PAYMENT BOND**

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS That

WHEREAS, the Citrus Heights Water District (hereinafter designated as the "District"), by action taken or a resolution passed _____, 20____ has awarded to _____ hereinafter designated as the "Principal," a contract for the work described as follows:

_____ (the "Project"); and

WHEREAS, the work to be performed by the Principal is more particularly set forth in the Contract Documents for the Project dated _____ ("Contract Documents"), the terms and conditions of which are expressly incorporated by reference; and

WHEREAS, said Principal is required to furnish a bond in connection with said contract; providing that if said Principal or any of its Subcontractors shall fail to pay for any materials, provisions, provender, equipment, or other supplies used in, upon, for or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, or for amounts due under the Unemployment Insurance Code or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of said Principal and its Subcontractors with respect to such work or labor the Surety on this bond will pay for the same to the extent hereinafter set forth.

NOW THEREFORE, we, the Principal and _____ as Surety, are held and firmly bound unto the District in the penal sum of _____ Dollars (\$_____) lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, his or its subcontractors, heirs, executors, administrators, successors or assigns, shall fail to pay any of the persons named in Section 9100 of the Civil Code, fail to pay for any materials, provisions or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department or Franchise Tax Board from the wages of employees of the contractor and his subcontractors pursuant to Section 18663 of the Revenue and Taxation Code, with respect to such work and labor the Surety or Sureties will pay for the same, in an amount not exceeding the sum herein above specified.

This bond shall inure to the benefit of any of the persons named in Section 9100 of the Civil Code so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

It is further stipulated and agreed that the Surety on this bond shall not be

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PAYMENT BOND**

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PAYMENT BOND**

exonerated or released from the obligation of this bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described, or pertaining or relating to the furnishing of labor, materials, or equipment therefore, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement herein above described, nor by any rescission or attempted rescission of the contract, agreement or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the owner or District and original contractor or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Section 9100 of the Civil Code, and has not been paid the full amount of his claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned and the provisions of sections 2819 and 2845 of the California Civil Code.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20__.

(Corporate Seal)

Contractor/ Principal

By _____

Title _____

(Corporate Seal)

Surety

By _____

Attorney-in-Fact

Title _____

Signatures of those signing for the Contractor and Surety must be notified and evidence of corporate authority attached. A Power-of-Attorney authorizing the person signing on behalf of the Surety to do so much be attached hereto.

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Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 20____, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory

Name(s) of Signer(s)

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

Title(s)

Title or Type of Document

- Partner(s) Limited
- General

Number of Pages

- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

Date of Document

Signer is representing:
Name Of Person(s) Or Entity(ies)

Signer(s) Other Than Named Above

END OF PAYMENT BOND

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**SECTION 00700
GENERAL CONDITIONS**

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GENERAL CONDITIONS

ARTICLE 1. DEFINITIONS

- a. Acceptable, Acceptance or words of similar import shall be understood to be the acceptance of the Engineer and/or the District .
- b. Act of God is an earthquake of magnitude 3.5 or higher on the Richter scale or a tidal wave.
- c. Applicable Laws means laws, statutes, ordinances, rules, codes, regulations permits and licenses of any kind, issued by local, state or federal governmental authorities or private authorities with jurisdiction (including utilities), to the extent they apply to the Work.
- d. Approval means written authorization by Engineer and/or District .
- e. Contract Documents includes all documents as stated in the Contract.
- f. Day shall mean calendar day unless otherwise specifically designated.
- g. District and Contractor are those stated in the Contract. The terms District, CHWD, and Owner may be used interchangeably.
- h. Engineer shall mean the District Engineer or his or her designee, of Citrus Heights Water District, acting either directly or through properly authorized agents, such as agents acting within the scope of the particular duties entrusted to them. Also sometimes referred to as the “District’s Representative” or “Representative” in the Contract Documents.
- i. Equal, Equivalent, Satisfactory, Directed, Designated, Selected, As Required and similar words shall mean the written approval, selection, satisfaction, direction, or similar action of the Engineer and/or District.
- j. Indicated, Shown, Detailed, Noted, Scheduled or words of similar meaning shall mean that reference is made to the drawings, unless otherwise noted. It shall be understood that the direction, designation, selection, or similar import of the Engineer and/or District is intended, unless stated otherwise.
- k. Install means the complete installation of any item, equipment or material.
- l. Material shall include machinery, equipment, manufactured articles, or construction such as form work, fasteners, etc., and any other classes of material to be furnished in connection with the Contract. All materials shall be new unless specified otherwise.

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- m. Perform shall mean that the Contractor, at Contractor's expense, shall take all actions necessary to complete The Work, including furnishing of necessary labor, tools, and equipment, and providing and installing Materials that are indicated, specified, or required to complete such performance.
- n. Project is The Work planned by District as provided in the Contract Documents.
- o. Provide shall include provide complete in place, that is furnish, install, test and make ready for use.
- p. Recyclable Waste Materials shall mean materials removed from the Project site which are required to be diverted to a recycling center rather than an area landfill. Recyclable Waste Materials include asphalt, concrete, brick, concrete block, and rock. The Contractor shall coordinate with the appropriate local government agency and comply with local waste disposal ordinances.
- q. Specifications means that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the work. In the case of conflict between the specifications and the Contract Documents, the Contract Documents shall prevail.
- r. The Work means the entire improvement planned by the District pursuant to the Contract Documents.
- s. Work means labor, equipment and materials incorporated in, or to be incorporated in the construction covered by the Contract Documents.

ARTICLE 2. CONTRACT DOCUMENTS

- a. **Contract Documents.** The Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all.
- b. **Interpretations.** The Contract Documents are intended to be fully cooperative and to be complementary. If Contractor observes that any documents are in conflict, the Contractor shall promptly notify the Engineer in writing. In case of conflicts between the Contract Documents, the order of precedence shall be as follows:
 - 1. Change Orders or Work Change Directives, the most recent first
 - 2. Addenda, the most recent first
 - 3. Environmental documents and approvals
 - 4. Federal Requirements
 - 5. Special Provisions (or Special Conditions)
 - 6. Technical Specifications
 - 7. Plans (Contract Drawings)

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GENERAL CONDITIONS**

8. Contract
9. General Conditions
10. Instructions to Bidders
11. Notice Inviting Bids
12. Contractor's Bid Forms
13. Standard Specifications/Greenbook
14. Standard Plans
15. Reference Documents

With reference to the Drawings, the order of precedence shall be as follows:

1. Figures govern over scaled dimensions
 2. Detail drawings govern over general drawings
 3. Addenda or Change Order drawings govern over Contract Drawings
 4. Contract Drawings govern over Standard Drawings
 5. Contract Drawings govern over Shop Drawings
- c. **Conflicts in Contract Documents.** Notwithstanding the orders of precedence established above, in the event of conflicts, the higher standard shall always apply.
- d. **Organization of Contract Documents.** Organization of the Contract Documents into divisions, sections, and articles, and arrangement of drawings shall not control the Contractor in dividing The Work among subcontractors or in establishing the extent of Work to be performed by any trade.

ARTICLE 3. CONTRACTS DOCUMENTS: COPIES & MAINTENANCE

Contractor will be furnished, free of charge, **6 (six)** copies of the Contract Documents. Additional copies may be obtained at cost of reproduction.

ARTICLE 4. CONTRACTOR SHALL MAINTAIN A CLEAN, UNDAMAGED SET OF CONTRACT DOCUMENTS AT THE PROJECT SITE.DETAIL DRAWINGS AND INSTRUCTIONS

- a. **Examination of Contract Documents.** Before commencing any portion of The Work, Contractor shall again carefully examine all applicable Contract Documents, the Project site and other information given to Contractor as to materials and methods of construction and other Project requirements. Contractor shall immediately notify the Engineer in writing of any potential error, inconsistency, ambiguity, conflict or lack of detail or explanation. If Contractor performs, permits, or causes the performance of any Work which is in error, inconsistent or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all resulting costs, including, without limitation, the cost of correction. In no case shall the Contractor or any subcontractor proceed with Work if uncertain as to the applicable requirements.

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- b. **Request for Information; Additional Instructions.** Contractor may make a written request for information to address any error, inconsistency, ambiguity, conflict or lack of detail or explanation in the Contract Documents. The Engineer will provide any required additional instructions, by means of drawings or other written direction, necessary for proper execution of Work.
- c. **Quality of Parts, Construction and Finish.** All parts of The Work shall be of the best quality of their respective kinds and the Contractor must use all diligence to inform itself fully as to the required construction and finish. In no case shall Contractor proceed with The Work without obtaining first from the Engineer such written Approval as may be necessary for the proper performance of Work.
- d. **Contractor's Variation from Contract Document Requirements.** If it is found that the Contractor has varied from the requirements of the Contract Documents including the requirement to comply with all Applicable Laws, ordinances, rules and regulations, the Engineer may at any time, before or after completion of the Work, order the improper Work removed, remade or replaced by the Contractor at the Contractor's expense.

ARTICLE 5. EXISTENCE OF UTILITIES AT THE WORK SITE

a. **Existing Utilities**

- i. General – Known existing utilities and pipelines are shown on the Plans in their approximate locations. However, nothing herein shall be deemed to require the District to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities can be inferred from the presence of other visible facilities, such as buildings, cleanouts, meter and junction boxes, on or adjacent to the site of the Project.
- ii. The District will assume the responsibility for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Project site if such utilities are not identified by the District in the Contract Documents or cannot reasonably be inferred from the presence of other visible facilities.

b. **Utility Location**

- i. It shall be the Contractor's responsibility to determine the exact location and depth of all utilities, including service connections, which have been marked by the respective utility owners and which the Contractor believes may affect or be affected by the Contractor's operations. The Contractor shall not be entitled to additional compensation or time extensions for work necessary to avoid interferences or for repair to damaged utilities if the

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Contractor does not expose all such existing utilities as required by this section.

- ii. The locating of utilities shall be in conformance with Government Code section 4216 except for the District's utilities located on the District's property and not in public right-of-way.
- iii. A "High Priority Subsurface Installation" is defined in section 4216 (e) as "high-pressure natural gas pipelines with normal operating pressures greater than 415kPA gauge (60psig) or greater than six inches nominal pipe diameter, petroleum pipelines, pressurized sewage pipelines, high-voltage electric supply lines, conductors, or cables that have a potential to ground of greater than or equal to 60kv, or hazardous materials pipelines that are potentially hazardous to workers or the public if damaged."
- iv. A "Subsurface Installation" is defined in section 4216 (l) as "any underground pipeline, conduit, duct, wire, or other structure, except non-pressurized sewer lines, non-pressurized storm drains, or other non-pressurized drain lines."
- v. Pursuant to Government Code section 4216.2 the Contractor shall contact the appropriate regional notification center at least two (2) working days but not more than fourteen (14) Days before performing any excavation. The Contractor shall request that the utility owners conduct a utility survey and mark or otherwise indicate the location of their service. The Contractor shall furnish to the District written documentation of its contact(s) with the regional notification center prior to commencing excavation at such locations.
- vi. After the utility survey is completed, the Contractor shall commence "potholing" or hand digging to determine the actual location of the pipe, duct, or conduit. The District shall be given written notice prior to commencing potholing operations. The Contractor shall uncover all piping and conduits, to a point one (1) foot below the pipe, where crossings, interferences, or connections are shown on the Drawings, prior to trenching or excavating for any pipe or structures, to determine actual elevations. New pipelines shall be laid to such grade as to clear all existing facilities, which are to remain in service for any period subsequent to the construction of the run of pipe involved.
- vii. The Contractor's attention is directed to the requirements of Government Code section 4216.2 (a)(2) which provides: "When the excavation is proposed within 10 feet of a high priority subsurface installation, the operator of the high priority subsurface installation shall notify the excavator of the existence of the high priority subsurface installation prior to the legal

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excavation start date and time, as such date and time are authorized pursuant to paragraph (1) of subdivision (a) of section 4216.2. The excavator and the operator or its representative shall conduct an onsite meeting at a mutually-agreed-on time to determine actions or activities required to verify the location of the high priority subsurface installation prior to start time.” The Contractor shall notify the District in advance of this meeting.

c. Utility Relocation and Repair

- i. If interferences occur at locations other than those indicated in the Contract Documents with reasonable accuracy, Contractor shall notify the District in writing.
- ii. Care shall be exercised by the Contractor to prevent damage to adjacent existing facilities and public or private works; where equipment will pass over these obstructions, suitable planking shall be placed. If high priority subsurface installations are damaged and the operator cannot be contacted, Contractor shall call 911 emergency services.
- iii. District will compensate the Contractor for the costs of locating and repairing damage not due to the failure of the Contractor to exercise reasonable care, and for removing or relocating such main or trunk line utility facilities not indicated in the Contract Documents with reasonable accuracy, and for the cost of equipment on the Project necessarily idled during such work. The payment for such costs will be made as provided in ARTICLE 47 (Changes and Extra Work). The Contractor shall not be assessed liquidated damages for delay in completion of the Project when such delay is caused by the failure of the District or utility company to provide for removal or relocation of such utility facilities. Requests for extensions of time arising out of utility relocation or repair delays shall be filed in accordance with ARTICLE 47.
- iv. The public utility, where they are the owner of the affected utility, shall have the sole discretion to perform repairs or relocation work or permit the Contractor to do such repairs or relocation work at a reasonable price. The right is reserved to the District and the owners of utilities or their authorized agents to enter upon the Work area for the purpose of making such changes as are necessary for the rearrangement of their facilities or for making necessary connections or repairs to their properties. The Contractor shall cooperate with forces engaged in such work and shall conduct its operations in such a manner as to avoid any unnecessary delay or hindrance to the work being performed by such forces and shall allow the respective utilities time to relocate their facility.

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- v. When the Contract Documents indicate that a utility is to be relocated, altered or constructed by others, the District will conduct all negotiations with the utility company and the work will be done at no cost to the Contractor, unless otherwise stipulated in the Contract.
- vi. Temporary or permanent relocation or alteration of utilities desired by the Contractor for its own convenience shall be the Contractor's responsibility and it shall make arrangements and bear all costs for such work.

ARTICLE 6. SCHEDULE

- a. **General Requirements.** The schedule shall be prepared in a Critical Path Method ("CPM") format and in an electronic scheduling program acceptable to the District. Contractor shall deliver the schedule and all updates to the District in both paper and electronic form. The electronic versions shall be in the format and include all data used to prepare the schedule; pdf. Copies are not acceptable.
- b. **Initial Schedule.** Within ten (10) days after the issuance of the Notice to Proceed, Contractor shall prepare a schedule for the performance of the Work and shall submit this to the Engineer for Approval. The receipt or Approval of any schedules by the Engineer or the District shall not in any way relieve the Contractor of its obligations under the Contract Documents. The Contractor is fully responsible to determine and provide for any and all staffing and resources at levels which allow for good quality and timely completion of the Project. Contractor's failure to incorporate all elements of Work required for the performance of the Contract or any inaccuracy in the schedule shall not excuse the Contractor from performing all Work required for a completed Project within the specified Contract time period. If the required schedule is not received by the time the first payment under the Contract is due, Contractor shall not be paid until the schedule is received, reviewed and accepted by the Engineer.
- c. **Schedule Contents.** The schedule shall allow enough time for inclement weather that can reasonably be expected at the Site. The schedule shall indicate the beginning and completion dates of all phases of construction; critical path for all critical, sequential time related activities; and "float time" for all "slack" or "gaps" in the non-critical activities. The schedule shall clearly identify all staffing and other resources which in the Contractor's judgment are needed to complete the Project within the Contract Time. Schedule duration shall match the Contract Time. Schedules indicating early completion will be rejected.
- d. **Schedule Updates.** Contractor shall continuously update its construction schedule to show the actual status of the Work and incorporate changes in the Work. Contractor shall submit an updated and accurate construction schedule to the Engineer whenever requested to do so by Engineer and with each progress payment request. The Engineer may withhold progress payments or other

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amounts due under the Contract Documents if Contractor fails to submit an updated and accurate construction schedule.

ARTICLE 7. SUBSTITUTIONS

- a. Pursuant to Public Contract Code Section 3400(b) the District may make a finding that is described in the invitation for bids that designates certain products, things, or services by specific brand or trade name.
- b. Unless specifically designated in the Contract Documents, whenever any material, process, or article is indicated or specified by grade, patent, or proprietary name or by name of manufacturer, such Specifications shall be deemed to be used for the purpose of facilitating the description of the material, process or article desired and shall be deemed to be followed by the words "or equal." Contractor may, unless otherwise stated, offer for substitution any material, process or article which shall be substantially equal or better in every respect to that so indicated or specified in the Contract Documents. However, the District may have adopted certain uniform standards for certain materials, processes and articles.
- c. Contractor shall submit written requests, together with substantiating data, for substitution of any "or equal" material, process or article no later than thirty-five (35) days after award of the Contract. To facilitate the construction schedule and sequencing, some requests may need to be submitted before thirty-five (35) days after award of Contract. Provisions regarding submission of "or equal" requests shall not in any way authorize an extension of time for performance of this Contract. If a proposed "or equal" substitution request is rejected, Contractor shall be responsible for providing the specified material, process or article without adjustment to the Contract Price or Contract Time. The burden of proof as to the equality of any material, process or article shall rest with the Contractor. The District has the complete and sole discretion to determine if a material, process or article is an "or equal" material, process or article that may be substituted.
- d. Data required to substantiate requests for substitutions of an "or equal" material, process or article data shall include a signed affidavit from the Contractor stating that, and describing how, the substituted "or equal" material, process or article is equivalent to that specified in every way except as listed on the affidavit. Substantiating data shall include any and all illustrations, specifications, and other relevant data including catalog information which describes the requested substituted "or equal" material, process or article, and substantiates that it is an "or equal" to the material, process or article. The substantiating data must also include information regarding the durability and lifecycle cost of the requested substituted "or equal" material, process or article. Failure to submit all the required substantiating data, including the signed affidavit, to the District in a timely fashion will result in the rejection of the proposed substitution.

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- e. The Contractor shall bear all of the District's costs associated with the review of substitution requests.
- f. The Contractor shall be responsible for all costs related to a substituted "or equal" material, process or article.
- g. Contractor is directed to the Special Conditions (if any) to review any findings made pursuant to Public Contract Code section 3400.

ARTICLE 8. SHOP DRAWINGS

- a. Contractor shall check and verify all field measurements and shall submit with such promptness as to provide adequate time for review and cause no delay in his own Work or in that of any other contractor, subcontractor, or worker on the Project, three (3) hard copies and one electronic copy of all shop or setting drawings, calculations, schedules, and materials list, and all other provisions required by the Contract. Contractor shall sign all submittals affirming that submittals have been reviewed and approved by Contractor prior to submission to Engineer. Each signed submittal shall affirm that the submittal meets all the requirements of the Contract Documents except as specifically and clearly noted and listed on the cover sheet of the submittal.
- b. Contractor shall make any corrections required by the Engineer, and file with the Engineer three (3) hard copies and one electronic copy each, and furnish such other copies as may be needed for completion of the Work. Engineer's approval of shop drawings shall not relieve Contractor from responsibility for deviations from the Contract Documents unless Contractor has, in writing, called Engineer's attention to such deviations at time of submission and has secured the Engineer's written Approval. Engineer's Approval of shop drawings shall not relieve Contractor from responsibility for errors in shop drawings.

ARTICLE 9. SUBMITTALS

- a. Contractor shall furnish to the Engineer for approval, prior to purchasing or commencing any Work, a log of all samples, material lists and certifications, mix designs, schedules, and other submittals, as required in the specifications. The log shall indicate whether samples will be provided in accordance with other provisions of this Contract.
- b. Contractor will provide samples and submittals, together with catalogs and supporting data required by the Engineer, to the Engineer within a reasonable time period to provide for adequate review and avoid delays in the Work.
- c. These requirements shall not authorize any extension of time for performance of this Contract. Engineer will check and approve such samples, but only for

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conformance with design concept of work and for compliance with information given in the Contract Documents. Work shall be in accordance with approved samples and submittals.

- d. Contractor shall not be entitled to any extension of the Contract Time on account of the requirements of ARTICLE 9.

ARTICLE 10. MATERIALS

- a. Except as otherwise specifically stated in the Contract Documents, Contractor shall provide and pay for all materials, labor, tools, equipment, water, lights, power, transportation, superintendence, temporary constructions of every nature, and all other services and facilities of every nature whatsoever necessary to execute and complete this Contract within the Contract Time.
- b. Unless otherwise specified, all materials shall be new and the best of their respective kinds and grades as noted and/or specified, and workmanship shall be of good quality.
- c. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress of The Work and shall be stored properly and protected as required by the Contract Documents. Contractor shall be entirely responsible for damage or loss by weather or other causes to materials or Work.
- d. No materials, supplies, or equipment for Work under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in the work and agrees upon completion of all work to deliver the Project, to the District free from any claims, liens, or charges.
- e. Materials shall be stored on the Project site in such manner so as not to interfere with any operations of the District or any independent contractor.

ARTICLE 11. CONTRACTOR'S SUPERVISION

Contractor shall continuously keep at the Project site, a competent and experienced full-time Project superintendent approved by the District. Superintendent must be able to proficiently speak, read and write in English. Contractor shall continuously provide efficient supervision of the Project.

ARTICLE 12. WORKERS

- a. Contractor shall at all times enforce strict discipline and good order among its employees and subcontractors. Contractor shall not employ or allow

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subcontractors to employ on the Project any unfit person or any one not skilled in the Work assigned to him or her.

- b. Any person in the employ of the Contractor whom the District may deem incompetent or unfit shall be dismissed from The Work and shall not be employed on this Project except with the written Approval of the District.

ARTICLE 13. SUBCONTRACTORS

- a. Contractor agrees to bind every subcontractor to the terms of the Contract Documents as far as such terms are applicable to subcontractor's portion of The Work. Contractor shall be as fully responsible to the District for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by its subcontractors, as Contractor is for acts and omissions of persons directly employed by Contractor. Nothing contained in these Contract Documents shall create any contractual relationship between any subcontractor and the District.
- b. The District reserves the right to Approve all subcontractors. The District's Approval of any subcontractor under this Contract shall not in any way relieve Contractor of its obligations in the Contract Documents.
- c. Prior to substituting any subcontractor listed in the Bid Forms, Contractor must comply with the requirements of the Subletting and Subcontracting Fair Practices Act pursuant to California Public Contract Code section 4100 et seq.

ARTICLE 14. VERIFICATION OF EMPLOYMENT ELIGIBILITY

By executing this Contract, Contractor verifies that it fully complies with all requirements and restrictions of state and federal law respecting the employment of undocumented aliens, including, but not limited to, the Immigration Reform and Control Act of 1986, as may be amended from time to time, and shall require all subcontractors, sub-subcontractors and consultants to comply with the same. Each person executing this Contract on behalf of Contractor verifies that he or she is a duly authorized officer of Contractor and that any of the following shall be grounds for the District to terminate the Contract for cause: (1) failure of the Contractor or its subcontractors, sub-subcontractors or consultants to meet any of the requirements provided for in this ARTICLE 14; (2) any misrepresentation or material omission concerning compliance with such requirements; or (3) failure to immediately remove from the Work any person found not to be in compliance with such requirements.

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ARTICLE 15. PERMITS AND LICENSES

Permits and licenses necessary for prosecution of The Work shall be secured and paid for by Contractor, unless otherwise specified in the Contract Documents.

- a. Contractor shall obtain and pay for all other permits and licenses required for The Work, including excavation permit and permits for plumbing, mechanical and electrical work and for operations in or over public streets or right of way under jurisdiction of public agencies other than the District.
- b. The Contractor shall arrange and pay for all off-site inspection of the Work related to permits and licenses, including certification, required by the specifications, drawings, or by governing authorities, except for such off-site inspections delineated as the District's responsibility pursuant to the Contract Documents.
- c. Before Acceptance of the Project, the Contractor shall submit all licenses, permits, certificates of inspection and required approvals to the District.

ARTICLE 16. UTILITY USAGE

- a. All temporary utilities, including but not limited to electricity, water, gas, and telephone, used on the Work shall be furnished and paid for by Contractor. Contractor shall Provide necessary temporary distribution systems, including meters, if necessary, from distribution points to points on The Work where the utility is needed. Upon completion of The Work, Contractor shall remove all temporary distribution systems.
- b. Contractor shall provide necessary and adequate utilities and pay all costs for water, electricity, gas, oil, and sewer charges required for completion of the Project, including but not limited to startup and testing required in the Contract Documents.
- c. All permanent meters Installed shall be listed in the Contractor's name until Project Acceptance.
- d. If the Contract is for construction in existing facilities, Contractor may, with prior written Approval of the District, use the District's existing utilities. If Contractor uses District utilities, it shall compensate the District for utilities used by Contractor.

ARTICLE 17. INSPECTION FEES FOR PERMANENT UTILITIES

All inspection fees and other municipal charges for permanent utilities including, but not limited to, sewer, electrical, phone, gas, water, and irrigation shall be paid for by the District. Contractor shall be responsible for arranging the payment of such fees, but

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inspection fees and other municipal fees relating to permanent utilities shall be paid by the District. Contractor may either request reimbursement from the District for such fees, or shall be responsible for arranging and coordination with District for the payment of such fees.

ARTICLE 18. TRENCHES

- a. Trenches Five Feet or More in Depth. The Contractor shall submit to the District, in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of any trench or trenches five feet or more in depth. If the plan varies from shoring system standards, the plan shall be prepared by a registered civil or structural engineer. The plan shall not be less effective than the shoring, bracing, sloping, or other provisions of the Construction Safety Orders, as defined in the California Code of Regulations, and all costs therefor shall be included in the Contract Price. Nothing in this section shall be deemed to allow the use of a shoring, bracing, sloping or other protective system less effective than that required by the Construction Safety Orders. Nothing in this section shall be construed to impose a tort liability on the owner, any of its officers, officials, partners, employees, agents, consultants or volunteers. The Owner's review of the Contractor's excavation plan is only for general conformance to the Construction Safety Orders and does not relieve the Contractor of any obligation hereunder. Prior to commencing any excavation, the Contractor shall designate in writing to the District the "competent person(s)" with authority and responsibilities designated in the Construction Safety Orders.
- b. Excavations Deeper than Four Feet. If work under this Contract involves digging trenches or other excavation that extends deeper than four feet below the surface, Contractor shall promptly, and before the following conditions are disturbed, notify the District, in writing, of any:
- 1) Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.
 - 2) Subsurface or latent physical conditions at the site differing from those indicated by information made available to bidders prior to the deadline for submitting bids.
 - 3) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

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The District shall promptly investigate the conditions, and if it finds that the conditions do so materially differ, or do involve hazardous waste, and cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of The Work, shall issue a change order under the procedures described in the Contract Documents.

In the event that a dispute arises between the District and the Contractor as to whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of The Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all Work to be performed under the Contract. Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the parties.

ARTICLE 19. DIVERSION OF RECYCLABLE WASTE MATERIALS

In compliance with the applicable District's waste reduction and recycling efforts, Contractor shall divert all Recyclable Waste Materials to appropriate recycling centers. Contractor will be required to submit weight tickets and written proof of diversion with its monthly progress payment requests. Contractor shall complete and execute any certification forms required by District or other applicable agencies to document Contractor's compliance with these diversion requirements. All costs incurred for these waste diversion efforts shall be the responsibility of the Contractor. The Contractor shall coordinate with the appropriate local government agency and comply with local waste disposal ordinances.

ARTICLE 20. REMOVAL OF HAZARDOUS MATERIALS

Should Contractor encounter material reasonably believed to be polychlorinated biphenyl (PCB) or other toxic wastes and hazardous materials (as defined in section 25117 of the Health and Safety Code) which have not been rendered harmless at the Project site, the Contractor shall immediately stop work at the affected Project site and shall report the condition to the District in writing. The District shall contract for any services required to directly remove and/or abate PCBs and other toxic wastes and hazardous materials, if required by the Project site(s), and shall not require the Contractor to subcontract for such services. The Work in the affected area shall not thereafter be resumed except by written agreement of the District and Contractor.

ARTICLE 21. SANITARY FACILITIES

Contractor shall provide sanitary temporary toilet buildings for the use of all workers. All toilets shall comply with local codes and ordinances. Toilets shall be kept supplied with toilet paper and shall have workable door fasteners. Toilets shall be serviced no less than once weekly and shall be present in a quantity of not less than 1 per 20 workers as

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required by CAL-OSHA regulation. The toilets shall be maintained in a sanitary condition at all times. Use of toilet facilities in The Work under construction shall not be permitted. Any other Sanitary Facilities required by CAL-OSHA shall be the responsibility of the Contractor.

ARTICLE 22. AIR POLLUTION CONTROL

Contractor shall comply with all air pollution control rules, regulations, ordinances and statutes. All containers of paint, thinner, curing compound, solvent or liquid asphalt shall be labeled to indicate that the contents fully comply with the applicable material requirements. Without limiting the foregoing, Contractor must fully comply with all Applicable Laws, rules and regulations in furnishing or using equipment and/ or providing services, including but not limited to, emissions limits and permitting requirements imposed by the Air Quality Management District with jurisdiction over the Project and/ or California Air Resources Board (CARB). Contractor shall specifically be aware of the application of these limits and requirements to “portable equipment” which definition is considered to include any item of equipment with a fuel-powered engine. Contractor shall indemnify District against any fines or penalties imposed by the air quality management district, CARB, or any other governmental or regulatory agency for its violations of Applicable laws as well as those of its subcontractors or others for whom Contractor is responsible under its indemnity obligations provided for in ARTICLE 49.

ARTICLE 23. COMPLIANCE WITH STATE STORM WATER PERMIT

- a. Contractor shall be required to comply with all conditions of the State Water Resources Control Board (“State Water Board”) Water Quality Order No. 2009-00009-DWQ as modified by Order No. 2010-0014-DWQ, National Pollutant Discharge Elimination System General Permit for Waste Discharge Requirements for Discharges of Storm Water Discharges Associated with Construction Activity (“Permit”) for all construction activity which results in the disturbance of in excess of one acre of total land area or which is part of a larger common area of development or sale. Contractor shall be responsible for filing the Notice of Intent and for obtaining the Permit. Contractor shall be solely responsible for preparing and implementing a Storm Water Pollution Prevention Plan (“SWPPP”) prior to initiating Work. In bidding on this Contract, it shall be Contractor’s responsibility to evaluate the cost of procuring the Permit and preparing the SWPPP as well as complying with the SWPPP and any necessary revision to the SWPPP. Contractor shall comply with all requirements of the State Water Resources Control Board. Contractor shall include all costs of compliance with specified requirements in the Contract amount.

- b. Contractor shall be responsible for procuring, implementing and complying with the provisions of the Permit and the SWPPP, including the standard provisions, monitoring and reporting requirements as required by the Permit. Contractor shall provide copies of all reports and monitoring information to the Engineer.

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- c. Contractor shall comply with the lawful requirements of any applicable municipality, the District, drainage District, and other local agencies regarding discharges of storm water to separate storm drain system or other watercourses under their jurisdiction, including applicable requirements in municipal storm water management programs.
- d. Storm, surface, nuisance, or other waters may be encountered at various times during construction of The Work. Therefore, the Contractor, by submitting a Bid, hereby acknowledges that it has investigated the risk arising from such waters, has prepared its Bid accordingly, and assumes any and all risks and liabilities arising therefrom.
- e. Failure to comply with the Permit is in violation of federal and state law. Contractor hereby agrees to indemnify and hold harmless District, its officials, officers, agents, employees and authorized volunteers from and against any and all claims, demands, losses or liabilities of any kind or nature which District, its officials, officers, agents, employees and authorized volunteers may sustain or incur for noncompliance with the Permit arising out of or in connection with the Project, except for liability resulting from the sole established negligence, willful misconduct or active negligence of the District, its officials, officers, agents, employees or authorized volunteers. District may seek damages from Contractor for delay in completing the Contract in accordance with the Contract Documents, caused by Contractor's failure to comply with the Permit.

ARTICLE 24. CLEANING UP

- a. Contractor at all times shall keep premises free from debris such as waste, rubbish, and excess materials and equipment. Contractor shall not store debris under, in, or about the premises. Upon completion of Work, Contractor shall clean the interior and exterior of the building or improvement including fixtures, equipment, walls, floors, ceilings, roofs, window sills and ledges, horizontal projections, and any areas where debris has collected so surfaces are free from foreign material or discoloration. Contractor shall clean and polish all glass, plumbing fixtures, and finish hardware and similar finish surfaces and equipment and contractor shall also remove temporary fencing, barricades, planking and construction toilet and similar temporary facilities from site. Contractor shall also clean all buildings, asphalt and concrete areas to the degree necessary to remove oil, grease, fuel, or other stains caused by Contractor operations or equipment.
- b. Contractor shall fully clean up the site at the completion of The Work. If the Contractor fails to immediately clean up at the completion of The Work, the District may do so and the cost of such clean up shall be charged back to the Contractor.

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ARTICLE 25. LAYOUT AND FIELD ENGINEERING

All field engineering required for laying out The Work and establishing grades for earthwork operations shall be furnished by the Contractor at its expense. Layout shall be done by a qualified individual Approved by the Engineer. Any required "as-built" drawings of civil engineering elements of the Work shall be prepared by a registered civil engineer.

ARTICLE 26. EXCESSIVE NOISE

- a. The Contractor shall use only such equipment on the work and in such state of repair so that the emission of sound therefrom is within the noise tolerance level of that equipment as established by CAL-OSHA.
- b. The Contractor shall comply with the most restrictive of the following: (1) local sound control and noise level rules, regulations and ordinances and (2) the requirements contained in these Contract Documents, including hours of operation requirements. No internal combustion engine shall be operated on the Project without a muffler of the type recommended by the manufacturer. Should any muffler or other control device sustain damage or be determined to be ineffective or defective, the Contractor shall promptly remove the equipment and shall not return said equipment to the job until the device is repaired or replaced. Said noise and vibration level requirements shall apply to all equipment on the job or related to the job, including but not limited to, trucks, transit mixers or transit equipment that may or may not be owned by the Contractor.
- c. The Contractor shall comply with all the environmental provisions contained in the Contract Documents.

ARTICLE 27. TESTS AND INSPECTIONS

- a. If the Contract Documents, the Engineer, or any instructions, laws, ordinances, or public authority require any part of The Work to be tested or Approved, Contractor shall provide the Engineer at least two (2) working days' notice of its readiness for observation or inspection. If inspection is by a public authority other than the District, Contractor shall promptly inform the District of the date fixed for such inspection. Required certificates of inspection (or similar) shall be secured by Contractor. Costs for District testing and District inspection shall be paid by the District. Costs of tests for Work found not to be in compliance with the Contract Documents or Applicable Law shall be paid by the Contractor.
- b. If any Work is done or covered up without the required testing or approval, the Contractor shall uncover or deconstruct the Work, and the Work shall be redone

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after completion of the testing at the Contractor's cost in compliance with the Contract Documents, at the Contractor's cost.

- c. Where inspection and testing are to be conducted by an independent laboratory or agency, materials or samples of materials to be inspected or tested shall be selected by such laboratory or agency, or by the District, and not by Contractor. All tests or inspections of materials shall be made in accordance with the commonly recognized standards of national organizations.
- d. In advance of manufacture of materials to be supplied by Contractor which must be tested or inspected, Contractor shall notify the District so that the District may arrange for testing at the source of supply. Any materials which have not satisfactorily passed such testing and inspection shall not be incorporated into The Work.
- e. If the manufacture of materials to be inspected or tested will occur in a plant or location outside the geographic limits of District, the Contractor shall pay for any excessive or unusual costs associated with such testing or inspection, including but not limited to excessive travel time, standby time and required lodging.
- f. Reexamination of Work may be ordered by the District. If so ordered, Work must be uncovered or deconstructed by Contractor. If Work is found to be in accordance with the Contract Documents, the District shall pay the costs of reexamination and reconstruction. If such work is found not to be in accordance with the Contract Documents, Contractor shall pay all costs.

ARTICLE 28. PROTECTION OF WORK AND PROPERTY

- a. The Contractor shall be responsible for all damages to persons or property that occur as a result of The Work. Contractor shall be responsible for the proper care and protection of all materials delivered and Work performed until completion and final Acceptance by the District. All Work shall be solely at the Contractor's risk. Contractor shall adequately protect adjacent property from settlement or loss of lateral support as necessary. Contractor shall comply with all applicable safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the Project site where Work is being performed. Contractor shall erect and properly maintain at all times, as required by field conditions and progress of work, all necessary safeguards, signs, barriers, lights, and watchmen for protection of workers and the public, and shall post danger signs warning against hazards created in the course of construction.
- b. In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization from the Engineer, is hereby permitted to act to prevent such threatened loss or injury; and Contractor shall so act, without appeal, if so authorized or instructed by the Engineer or the District.

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Any compensation claimed by Contractor on account of emergency work shall be determined by and agreed upon by the District and the Contractor in accordance with ARTICLE 47.

- c. Contractor shall provide such heat, covering, and enclosures as are necessary to protect all Work, materials, equipment, appliances, and tools against damage by weather conditions.
- d. Contractor shall take adequate precautions to protect existing sidewalks, curbs, pavements, utilities, and other adjoining property and structures, and to avoid damage thereto, and Contractor shall repair any damage thereto caused by The Work operations. Contractor shall:
 - 1) Enclose the working area with a substantial barricade, and arrange work to cause minimum amount of inconvenience and danger to the public.
 - 2) Provide substantial barricades around any shrubs or trees indicated to be preserved.
 - 3) Deliver materials to the Project site over a route designated by the Engineer.
 - 4) Provide any and all dust control required and follow the Applicable air quality regulations as appropriate. If the Contractor does not comply, the District shall have the immediate authority to provide dust control and deduct the cost from payments to the Contractor.
 - 5) Confine Contractor's apparatus, the storage of materials, and the operations of its workers to limits required by law, ordinances, permits, or directions of the Engineer. Contractor shall not unreasonably encumber the Project site with its materials.
 - 6) Take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed by accident, they shall be replaced by an approved civil engineer or land surveyor, at no cost to the District.
 - 7) Ensure that existing facilities, fences and other structures are all adequately protected and that, upon completion of all Work, all facilities that may have been damaged are restored to a condition acceptable to the District.
 - 8) Preserve and protect from injury all buildings, pole lines and all direction, warning and mileage signs that have been placed within the right-of-way.
 - 9) At the completion of work each day, leave the Project site in a clean, safe condition.

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- 10) Comply with any stage construction and traffic handling plans. Access to residences and businesses shall be maintained at all times.

These precautionary measures will apply continuously and not be limited to normal working hours. Full compensation for the Work involved in the preservation of life, safety and property as above specified shall be considered as included in the prices paid for the various contract items of Work, and no additional allowance will be made therefor.

- e. Should damage to persons or property occur as a result of The Work, Contractor shall promptly notify the District, in writing. Contractor shall be responsible for proper investigation, documentation, including video or photography, to adequately memorialize and make a record of what transpired. The District shall be entitled to inspect and copy any such documentation, video, or photographs.

ARTICLE 29. CONTRACTORS MEANS AND METHODS

Contractor is solely responsible for the means and methods utilized to Perform The Work. In no case shall the Contractor's means and methods deviate from commonly used industry standards.

ARTICLE 30. INSPECTOR'S FIELD OFFICE

- a. The Contractor shall be responsible for providing the inspector's field office. The Office shall be a substantial waterproof construction with adequate natural light and ventilation by means of stock design windows. Door shall have a key type lock or padlock clasp. The office shall have heating and air conditioning and shall be equipped with a telephone, a telephone answering machine, high speed internet connection, and a fax machine at Contractor's expense.
- b. A table satisfactory for the study of plans and two chairs shall be Provided by Contractor. Contractor shall Provide and pay for adequate electric lights, local telephone service, and adequate heat and air conditioning for the field office until authorized removal.

ARTICLE 31. AUTHORIZED REPRESENTATIVES

The District shall designate representatives, who shall have the right to be present at the Project site at all times. The District may designate an inspector who shall have the right to observe all of the Contractor's Work. The inspector is not authorized to make changes in the Contract Documents or excuse Contractor from performing in accordance with the Contract Documents. The inspector shall not be responsible for the Contractor's failure to carry out The Work in accordance with the Contract Documents. Contractor shall provide safe and proper facilities for such access.

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ARTICLE 32. HOURS OF WORK

- a. Eight (8) hours of work shall constitute a legal day's work. The Contractor and each subcontractor shall forfeit, as penalty to the District, twenty-five dollars (\$25) for each worker employed in the execution of Work by the Contractor or any subcontractor for each day during which such worker is required or permitted to work more than eight (8) hours in any one day and forty (40) hours in any week in violation of the provisions of the Labor Code, and in particular, Section 1810 to Section 1815, except as provided in Labor Code Section 1815.
- b. Work shall be accomplished on a regularly scheduled eight (8) hour per day work shift basis, Monday through Friday, between the hours of 7:00 a.m. and 5:00 p.m.
- c. It shall be unlawful for any person to operate, permit, use, or cause to operate any of the following at the Project site, other than between the hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, with no Work allowed on District-observed holidays, unless otherwise Approved by the Engineer:
 - 1) Powered Vehicles
 - 2) Construction Equipment
 - 3) Loading and Unloading Vehicles
 - 4) Domestic Power Tool.

ARTICLE 33. PAYROLL RECORDS

- a. Pursuant to Labor Code Section 1776, the Contractor and each subcontractor shall maintain weekly certified payroll records showing the name, address, social security number, work classification, straight time and overtime hours paid each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed in connection with the work. Contractor shall certify under penalty of perjury that records maintained and submitted by Contractor are true and accurate. Contractor shall also require subcontractor(s) to certify weekly payroll records under penalty of perjury.
- b. The payroll records described herein shall be certified and submitted by the Contractor at a time designated by the District. The Contractor shall also provide the following:
 - 1) A certified copy of the employee's payroll records shall be made available for inspection or furnished to such employee or his or her authorized representative on request.

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- 2) A certified copy of all payroll records described herein shall be made available for inspection or furnished upon request of the Department of Industrial Relations (“DIR”).
- c. The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement (“DLSE”) of the DIR or shall contain the same information as the forms provided by the DLSE.
- d. Any copy of records made available for inspection and furnished upon request to the public shall be marked or obliterated in such a manner as to prevent disclosure of an individual’s name, address, and social security number. The name and address of the Contractor or any subcontractor shall not be marked or obliterated.
- e. In the event of noncompliance with the requirements of this Section, the Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying any item or actions necessary to ensure compliance with this section. Should noncompliance still be evident after such ten (10) day period, the Contractor shall, as a penalty to the District, forfeit One Hundred Dollars (\$100.00) for each Day, or portion thereof, for each worker until strict compliance is effectuated. Upon the request of the DIR, such penalties shall be withheld from contract payments.

ARTICLE 34. PREVAILING RATES OF WAGES

- a. The Contractor is aware of the requirements of Labor Code Sections 1720 et seq. and 1770 et seq., as well as California Code of Regulations, Title 8, Section 16000 et seq. (“Prevailing Wage Laws”), which require the payment of prevailing wage rates and the performance of other requirements on certain “public works” and “maintenance” projects. Since this Project involves an applicable “public works” or “maintenance” project, as defined by the Prevailing Wage Laws, and since the total compensation is \$1,000 or more, Contractor agrees to fully comply with such Prevailing Wage Laws. The Contractor shall obtain a copy of the prevailing rates of per diem wages at the commencement of this Agreement from the website of the Division of Labor Statistics and Research of the Department of Industrial Relations located at www.dir.ca.gov/dlsr/. In the alternative, the Contractor may view a copy of the prevailing rates of per diem wages at the District. Contractor shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to perform work on the Project available to interested parties upon request, and shall post copies at the Contractor’s principal place of business and at the Project site. Contractor shall defend, indemnify and hold the District, its elected officials, officers, employees and agents free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or allege failure to comply with the Prevailing Wage Laws.

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- b. The Contractor and each subcontractor shall forfeit as a penalty to the District not more than Two Hundred dollars (\$200.00) for each Day, or portion thereof, for each worker paid less than the stipulated prevailing wage rate for any work done by him, or by any subcontract under him, in violation of the provisions of the Labor Code. The difference between such stipulated prevailing wage rate and the amount paid to each worker for each Day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor.
- c. Contractor shall post, at appropriate conspicuous points on the Project site, a schedule showing all determined general prevailing wage rates and all authorized deductions, if any, from unpaid wages actually earned.

ARTICLE 35. EMPLOYMENT OF APPRENTICES

The Contractor's attention is directed to the provisions of Sections 1777.5, 1777.6, and 1777.7 of the Labor Code concerning employment of apprentices by the Contractor or any subcontractor. The Contractor shall obtain a certificate of apprenticeship before employing any apprentice pursuant to Section 1777.5, 1777.6, and 1777.7 of the Labor Code. Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, the Administrator of Apprenticeships, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.

ARTICLE 36. LABOR COMPLIANCE

This Project is subject to labor compliance monitoring and enforcement by the Department of Industrial Relations. It shall be the Contractor's sole responsibility to evaluate and include the cost of complying with all labor compliance requirements under this contract and applicable law in its bid.

Contractor shall post, at each job site, the notice required by Section 16451(d) of Title 8 of the California Code of Regulations. Template notices are available by emailing a request to CMU@dir.ca.gov or at the following location.

District Office of the Division of Labor Standards Enforcement
1515 Clay Street, Suite 801
Oakland, CA 94612

In accordance with Labor Code section 1771.4, the Contractor and each subcontractor shall furnish the certified payroll records directly to the Department of Industrial Relations on a weekly basis and in the format prescribed by the Department of Industrial Relations, which may include electronic submission. Contractor shall comply with all requirements

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and regulations from the Department of Industrial Relations relating to labor compliance monitoring and enforcement.

ARTICLE 37. CONTRACTOR AND SUBCONTRACTOR REGISTRATION

If the bids subject to the Notice Inviting Bids are due on or after March 1, 2015, then pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work.

**ARTICLE 38. NONDISCRIMINATION/EQUAL EMPLOYMENT
OPPORTUNITY/EMPLOYMENT ELIGIBILITY**

Pursuant to Labor Code Section 1735 and other applicable provisions of law, the Contractor and its subcontractors shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap on this Work. The Contractor will take affirmative action to insure that employees are treated during employment or training without regard to their race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap.

Employment Eligibility; Contractor. By executing this Contract, Contractor verifies that it fully complies with all requirements and restrictions of state and federal law respecting the employment of undocumented aliens, including, but not limited to, the Immigration Reform and Control Act of 1986, as may be amended from time to time. Such requirements and restrictions include, but are not limited to, examination and retention of documentation confirming the identity and immigration status of each employee of the Contractor. Contractor also verifies that it has not committed a violation of any such law within the five (5) years immediately preceding the date of execution of this Contract, and shall not violate any such law at any time during the term of the Contract. Contractor shall avoid any violation of any such law during the term of this Contract by participating in an electronic verification of work authorization program operated by the United States Department of Homeland Security, by participating in an equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, or by some other legally acceptable method. Contractor shall maintain records of each such verification, and shall make them available to the District or its representatives for inspection and copy at any time during normal business hours. The District shall not be responsible for any costs or expenses

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related to Contractor's compliance with the requirements provided for or referred to herein.

Employment Eligibility; Subcontractors, Sub-subcontractors and Consultants. To the same extent and under the same conditions as Contractor, Contractor shall require all of its subcontractors, sub-subcontractors and consultants performing any part of the Work or of this Contract to make the same verifications and comply with all requirements and restrictions provided for herein.

Employment Eligibility; Failure to Comply. Each person executing this Contract on behalf of Contractor verifies that he or she is a duly authorized officer of Contractor, and understands that any of the following shall be grounds for the District to terminate the Contract for cause: (1) failure of Contractor or its subcontractors, sub-subcontractors or consultants to meet any of the requirements provided for herein; (2) any misrepresentation or material omission concerning compliance with such requirements; or (3) failure to immediately remove from the Work any person found not to be in compliance with such requirements.

ARTICLE 39. LABOR/EMPLOYMENT SAFETY

The Contractor shall maintain emergency first aid treatment for his employees which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.), and California Code of Regulations, Title 8, Industrial Relations Division 1, Department of Industrial Relations, Chapter 4. Contractor certifies that it is aware of and has complied with the provisions of California Labor Code section 6401.7, which requires every employer to adopt a written injury and illness prevention program.

ARTICLE 40. INSURANCE

The Contractor shall obtain, and at all times during performance of the Work of Contract, maintain all of the insurance described in ARTICLE 40. Contractor shall not commence Work under this Contract until it has provided evidence satisfactory to the District that it has secured all insurance required hereunder. Contractor shall not allow any subcontractor to commence work on any subcontract until it has provided evidence satisfactory to the District that the subcontractor has secured all insurance required under this section. Failure to provide and maintain all required insurance shall be grounds for the District to terminate this Contract for cause. Contractor shall furnish District with original certificates of insurance and endorsements effective coverage required by this Contract on forms satisfactory to the District. The certificates and endorsements for each insurance policy shall be signed by a person authorized by that insurer to bind coverage on its behalf, and shall be on forms acceptable to the District. All certificates and endorsements must be received and approved by the District before Work commences.

- a. Additional Insureds; Waiver of Subrogation; Primary and Non-Contributory. The District, its elected officials, officers, employees, agents and authorized volunteers

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shall be named as Additional Insureds on Contractor's All Risk policy and on Contractor's and its subcontractors' policies of Commercial General Liability and Automobile Liability insurance using, for Contractor's policy/ies of Commercial General Liability insurance, ISO CG forms 20 10 and 20 37 (or endorsements providing the exact same coverage, including completed operations), and, for subcontractors' policies of Commercial General Liability insurance, ISO CG form 20 38 (or endorsements providing the exact same coverage). Notwithstanding the minimum limits set forth in this Contract for any type of insurance coverage, all available insurance proceeds in excess of the specified minimum limits of coverage shall be available to the parties required to be named as Additional Insureds hereunder. Contractor and its insurance carriers shall provide a Waiver of Subrogation Endorsement in favor of those parties. Contractor shall provide Primary and Non-Contributory wording in favor of those parties.

- b. **Workers' Compensation Insurance.** The Contractor shall provide workers' compensation insurance for all of the employees engaged in Work under this Contract, on or at the Site, and, in case of any sublet Work, the Contractor shall require the subcontractor similarly to provide workers' compensation insurance for all the latter's employees as prescribed by State law. Any class of employee or employees not covered by a subcontractor's insurance shall be covered by the Contractor's insurance. In case any class of employees engaged in work under this Contract, on or at the Site, is not protected under the Workers' Compensation Statutes, the Contractor shall provide or shall cause a subcontractor to provide, adequate insurance coverage for the protection of such employees not otherwise protected. The Contractor is required to secure payment of compensation to his employees in accordance with the provisions of section 3700 of the Labor Code. The Contractor shall file with the District certificates of his insurance protecting workers. Company or companies providing insurance coverage shall be acceptable to the District, if in the form and coverage as set forth in the Contract Documents. Such coverage shall include a Waiver of Subrogation Endorsement in favor of the District.
- c. **Employer's Liability Insurance.** Contractor shall provide Employer's Liability Insurance, including Occupational Disease, in the amount of at least one million dollars (\$1,000,000.00) per person per accident. Contractor shall provide District with a certificate of Employer's Liability Insurance. Such insurance shall comply with the provisions of the Contract Documents. The policy shall be endorsed, if applicable, to provide a Borrowed Servant/Alternate Employer Endorsement and contain a Waiver of Subrogation in favor of the District.
- d. **Commercial General Liability Insurance.** Contractor shall provide "occurrence" form Commercial General Liability insurance coverage at least as broad as the most current ISO CGL Form 00 01, including but not limited to, premises liability, contractual liability, products/completed operations, personal and advertising

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injury which may arise from or out of Contractor's operations, use, and management of the Site, or the performance of its obligations hereunder. The policy shall not contain any exclusion contrary to this Contract including but not limited to endorsements or provisions limiting coverage for (1) contractual liability (including but not limited to ISO CG 24 26 or 21 39); or (2) cross-liability for claims or suits against one insured against another. Policy limits shall not be less than \$1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit. Defense costs shall be paid in addition to the limits.

- i. Such policy shall comply with all the requirements of this Article. The limits set forth herein shall apply separately to each insured against whom claims are made or suits are brought, except with respect to the limits of liability. Further the limits set forth herein shall not be construed to relieve the Contractor from liability in excess of such coverage, nor shall it limit Contractor's indemnification obligations to the District, and shall not preclude the District from taking such other actions available to the District under other provisions of the Contract Documents or law.
- ii. All general liability policies provided pursuant to the provisions of this Article shall comply with the provisions of the Contract Documents.
- iii. All general liability policies shall be written to apply to all bodily injury, including death, property damage, personal injury, owned and non-owned equipment, blanket contractual liability, completed operations liability, explosion, collapse, under-ground excavation, removal of lateral support, and other covered loss, however occasioned, occurring during the policy term, and shall specifically insure the performance by Contractor of that part of the indemnification contained in these General Conditions relating to liability for injury to or death of persons and damage to property.
- iv. If the coverage contains one or more aggregate limits, a minimum of 50% of any such aggregate limit must remain available at all times; if over 50% of any aggregate limit has been paid or reserved, the District may require additional coverage to be purchased by Contractor to restore the required limits. Contractor may combine primary, umbrella, and as broad as possible excess liability coverage to achieve the total limits indicated above. Any umbrella or excess liability policy shall include the additional insured endorsement described in the Contract Documents.

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- v. All policies of general liability insurance shall permit and Contractor does hereby waive any right of subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss.

- e. Automobile Liability Insurance. Contractor shall provide “occurrence” form Automobile Liability Insurance at least as broad as ISO CA 00 01 (Any Auto) in the amount of, at least, one million dollars (\$1,000,000) per accident for bodily injury and property damage. Such insurance shall provide coverage with respect to the ownership, operation, maintenance, use, loading or unloading of any auto owned, leased, hired or borrowed by Contractor or for which Contractor is responsible, in a form and with insurance companies acceptable to the District. All policies of automobile insurance shall permit and Contractor does hereby waive any right of subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. Contractor shall provide an Automobile Additional Insured Endorsement to the District.

- f. Builder’s Risk/Installation Floater [“All Risk”]
 - i. It is the Contractor’s responsibility to maintain or cause to be maintained Builder’s Risk/Installation Floater [“All Risk”] extended coverage insurance on all work, material, equipment, appliances, tools, and structures that are or will become part of the Work and subject to All Risks in an amount to cover 100% of the replacement cost. The District accepts no responsibility for the Work until the Work is formally accepted by the District. The Contractor shall provide a certificate evidencing this coverage before commencing performance of the Work.

 - ii. The named insureds shall be Contractor, all Subcontractors of any tier (excluding those solely responsible for design work), suppliers, and District, its elected officials, officers, employees, agents and authorized volunteers, as their interests may appear. Contractor shall not be required to maintain property insurance for any portion of the Work following acceptance by District.

 - iii. Policy shall be provided for replacement value on an “all risk” basis. There shall be no coinsurance penalty provision in any such policy. Policy must include: (1) coverage for any ensuing loss from faulty workmanship, nonconforming work, omission or deficiency in design or specifications; (2) coverage against machinery accidents and operational testing; (3) coverage for removal of debris, and insuring the buildings, structures, machinery, equipment, materials, facilities, fixtures and all other properties constituting a part of the Project; (4) transit coverage, including ocean marine coverage (unless insured by the supplier), with sub-limits sufficient to insure the full replacement value of any key equipment item; and

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(5) coverage with sub-limits sufficient to insure the full replacement value of any property or equipment stored either on or off the Site. Such insurance shall be on a form acceptable to District to ensure adequacy and sublimit.

- iv. In addition, the policy shall meet the following requirements:
 - 1) Insurance policies shall be so conditioned as to cover the performance of any extra work performed under the Contract.
 - 2) Coverage shall include all materials stored on site and in transit.
 - 3) Coverage shall include Contractor's tools and equipment.
 - 4) Insurance shall include boiler, machinery and material hoist coverage.
- g. Contractor shall require all tiers of sub-contractors working under this Contract to provide the insurance required under this Article unless otherwise agreed to in writing by District. Contractor shall make certain that any and all subcontractors hired by Contractor are insured in accordance with this Contract. If any subcontractor's coverage does not comply with the foregoing provisions, Contractor shall indemnify and hold the District harmless from any damage, loss, cost, or expense, including attorneys' fees, incurred by the District as a result thereof.

ARTICLE 41. FORM AND PROOF OF CARRIAGE OF INSURANCE

- a. Any insurance carrier providing insurance coverage required by the Contract Documents shall be authorized to do business in the State of California unless waived, in writing, by the District's General Manager. Carrier(s) shall have an A.M. Best rating of not less than an A:IX. Insurance deductibles or self-insured retentions must be declared by the Contractor. At the election of the District, the Contractor shall either 1) reduce or eliminate such deductibles or self-insured retentions, or 2) procure a bond which guarantees payment of losses and related investigations, claims administration, and defense costs and expenses. If umbrella or excess liability coverage is used to meet any required limit(s) specified herein, the Contractor shall provide a "follow form" endorsement satisfactory to the District indicating that such coverage is subject to the same terms and conditions as the underlying liability policy.
- b. Each insurance policy required by this Contract shall be endorsed to state that: (1) should any of the above described be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions; and (2) any failure to comply with reporting or other provisions of the policies, including breaches of warranties, shall not affect coverage provided to the District its directors, officials, officers, employees, agents and volunteers.

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- c. The Certificate(s) and policies of insurance shall contain or shall be endorsed to contain the covenant of the insurance carrier(s) that it shall provide no less than thirty (30) days written notice be given to the District prior to any material modification or cancellation of such insurance. In the event of a material modification or cancellation of coverage, the District may terminate the Contract or stop the Work in accordance with the Contract Documents, unless the District receives, prior to such effective date, another properly executed original Certificate of Insurance and original copies of endorsements or certified original policies, including all endorsements and attachments thereto evidencing coverage's set forth herein and the insurance required herein is in full force and effect. Contractor shall not take possession, or use the Site, or commence operations under this Contract until the District has been furnished original Certificate(s) of Insurance and certified original copies of endorsements or policies of insurance including all endorsements and any and all other attachments as required in this section. The original endorsements for each policy and the Certificate of Insurance shall be signed by an individual authorized by the insurance carrier to do so on its behalf.
- d. The Certificate(s) of Insurance, policies and endorsements shall so covenant and shall be construed as primary, and the District's insurance and/or deductibles and/or self-insured retentions or self-insured programs shall not be construed as contributory.
- e. The District reserves the right to adjust the monetary limits of insurance coverages during the term of this Contract including any extension thereof if in the District's reasonable judgment, the amount or type of insurance carried by the Contractor becomes inadequate.
- f. Contractor shall report to the District, in addition to Contractor's insurer, any and all insurance claims submitted by the Contractor in connection with the Work under this Contract.

ARTICLE 42. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- a. **Time for Completion/Liquidated Damages.** Work shall be commenced within ten (10) days of the date stated in the District's Notice to Proceed and shall be completed by Contractor in the Contract Time. The District is under no obligation to consider early completion of the Project; and the Contract completion date shall not be amended by the District's receipt or acceptance of the Contractor's proposed earlier completion date. Furthermore, Contractor shall not, under any circumstances, receive additional compensation from the District (including but not limited to indirect, general, administrative or other forms of overhead costs) for the period between the time of earlier completion proposed by the Contractor and the Contract completion date. If The Work is not completed within the Contract Time, it is understood that the District will suffer damage. In accordance with Government Code section 53069.85, being impractical and infeasible to determine

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the amount of actual damage, it is agreed that Contractor shall pay to the District as fixed and liquidated damages, and not as a penalty, the sum stipulated in the Contract for each day of delay until The Work is fully completed. Contractor and its surety shall be liable for any liquidated damages. Any money due or to become due the Contractor may be retained to cover liquidated damages.

- b. **Inclement Weather.** Contractor shall abide the Engineer's determination of what constitutes inclement weather. Time extensions for inclement weather shall only be granted when the Work stopped during inclement weather is on the critical path of the then-current Project schedule.
- c. **Extension of Time.** Contractor shall not be charged liquidated damages because of any delays in completion of The Work due to unforeseeable causes beyond the control and without the fault or negligence of Contractor (or its subcontractors or suppliers). Contractor shall within five (5) Days of identifying any such delay notify the District in writing of causes of delay. The District shall ascertain the facts and extent of delay and grant extension of time for completing The Work when, in its judgment, the facts justify such an extension. Time extensions to the Project shall be requested by the Contractor as they occur and without delay. No delay claims shall be permitted unless the event or occurrence delays the completion of the Project beyond the Contract completion date.
- d. **No Damages for Reasonable Delay.** The District's liability to Contractor for delays for which the District is responsible shall be limited to only an extension of time unless such delays were unreasonable under the circumstances. In no case shall the District be liable for any costs which are borne by the Contractor in the regular course of business, including, but not limited to, home office overhead and other ongoing costs. Damages caused by unreasonable District delay, including delays caused by items that are the responsibility of the District pursuant to Government Code section 4215, shall be based on actual costs only, no proportions or formulas shall be used to calculate any delay damages.

ARTICLE 43. COST BREAKDOWN AND PERIODIC ESTIMATES

Contractor shall furnish on forms Approved by the District:

- a. Within ten (10) Days of award of the Contract a detailed Schedule of Values giving a complete breakdown of the Contract price. The Schedule of Values shall be adjusted as directed by the District;
- b. A monthly itemized estimate of Work done for the purpose of making progress payments. In order for the District to consider and evaluate each progress payment application, the Contractor shall submit a detailed measurement of Work performed and a progress estimate of the value thereof before the tenth (10th) Day of the following month.

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- c. Contractor shall submit, with each of its payment requests, an adjusted list of actual quantities, verified by the Engineer, for unit price items listed, if any, in the Bid Form.
- d. Following the District's Acceptance of the Work, the Contractor shall submit to the District a written statement of the final quantities of unit price items for inclusion in the final payment request.
- e. The District shall have the right to adjust any estimate of quantity and to subsequently correct any error made in any estimate for payment.

Contractor shall certify under penalty of perjury, that all cost breakdowns and periodic estimates accurately reflect the Work on the Project.

ARTICLE 44. MOBILIZATION

- a. When a bid item is included in the Bid Form for mobilization, the costs of Work in advance of construction operations and not directly attributable to any specific bid item will be included in the progress estimate ("Initial Mobilization"). When no bid item is provided for "Initial Mobilization," payment for such costs will be deemed to be included in the other items of The Work.
- b. Payment for Initial Mobilization shall be based on the lump sum provided in the Bid Form, which shall constitute full compensation for all such Work. No payment for Initial Mobilization will be made until all of the listed items have been completed to the satisfaction of the Engineer. The scope of the Work included under Initial Mobilization shall include, but shall not be limited to, the following principal items:
 - 1. Obtaining and paying for all bonds, insurance, and permits.
 - 2. Moving on to the Project site of all Contractor's plant and equipment required for first month's operations.
 - 3. Installing temporary construction power, wiring, and lighting facilities.
 - 4. Establishing fire protection system.
 - 5. Developing and installing a construction water supply.
 - 6. Providing and maintaining the field office trailers for the Contractor and the Engineer, complete, with all specified furnishings and utility services including telephones, telephone appurtenances, computer and printer, and copying machine.
 - 7. Providing on-site communication facilities for the Owner and the Engineer, including telephones, radio pagers, and fax machines.

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8. Providing on-site sanitary facilities and potable water facilities as specified per Cal-OSHA and these Contract Documents.
9. Furnishing, installing, and maintaining all storage buildings or sheds required for temporary storage of products, equipment, or materials that have not yet been installed in the Work. All such storage shall meet manufacturer's specified storage requirements, and the specific provisions of the specifications, including temperature and humidity control, if recommended by the manufacturer, and for all security.
10. Arranging for and erection of Contractor's work and storage yard.
11. Posting all OSHA required notices and establishment of safety programs per Cal-OSHA.
12. Full-time presence of Contractor's superintendent at the job site as required herein.
13. Submittal of Construction Schedule as required by the Contract Documents.

ARTICLE 45. PAYMENTS

- a. The District shall make monthly progress payments following receipt of undisputed and properly submitted payment requests. Unless the District has made findings pursuant to Public Contract Code section 7201 (that the work included in this Contract is substantially complex, and therefore a retention of 10% shall be withheld from each progress payment as provided by the Contract Documents), Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of Work performed up to the last day of the previous month, less the aggregate of previous payments. District will, within forty-five (45) days after receipt of an undisputed and properly submitted application for payment, pay the Contractor the amount so approved.
- b. The Contractor shall, after the full completion of The Work, submit a final payment application. All prior progress estimates shall be subject to correction in the final estimate and payment.
- c. Unless otherwise required by law or unless the District has made findings pursuant to Public Contract Code section 7201 (that the work included in this Contract is substantially complex, and therefore a retention of 10% shall be withheld from each progress payment as provided by the Contract Documents), the final payment of five percent (5%) of the value of the Work, if unencumbered, shall be paid no later than sixty (60) Days after the date of recordation of the Notice of Completion.

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- d. Acceptance by Contractor of the final payment shall constitute a waiver of all claims against the District arising from this Contract.
- e. Payments to the Contractor shall not be construed to be an acceptance of any defective work or improper materials, or to relieve the Contractor of its obligations under the Contract Documents.
- f. The Contractor shall submit with each payment request the Contractor's conditional waiver of lien for the entire amount covered by such payment request, as well as a valid unconditional waiver of lien from the Contractor and all subcontractors and materialmen for all work and materials included in any prior invoices. Waivers of lien shall be in the forms prescribed by California Civil Code Section 8132, 8132, 8136 and 8138. Prior to final payment by the District, the Contractor shall submit a final conditional waiver of lien for the Contractor's work, together with unconditional releases of lien from any subcontractor or materialmen.

ARTICLE 46. PAYMENTS WITHHELD AND BACKCHARGES

In addition to amounts which the District may retain under other provisions of the Contract Documents the District may withhold payments due to Contractor as the District may consider to be necessary to cover:

- a. Stop Notice Claims.
- b. Defective work not remedied.
- c. Failure of Contractor to make proper payments to its subcontractors or suppliers.
- d. Completion of the Contract if there exists a reasonable doubt that the work can be completed for balance then unpaid.
- e. Damage to another contractor or third party.
- f. Amounts which may be due the District for claims against Contractor.
- g. Failure of Contractor to keep the record ("as-built") drawings up to date.
- h. Failure to provide updates on the construction schedule.
- i. Site cleanup.
- j. Failure of the Contractor to comply with requirements of the Contract Documents.
- k. Liquidated damages.
- l. Legally permitted penalties.

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Upon completion of the Contract, the District will reduce the final Contract amount to reflect costs charged to the Contractor, back charges or payments withheld pursuant to the Contract Documents.

ARTICLE 47. CHANGES AND EXTRA WORK

a. Change Order Work.

- 1) The District, without invalidating the Contract, may order changes in the Work consisting of additions, deletions or other revisions, the Contract Price and Contract Time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents. A Change Order signed by the Contractor indicates the Contractor's agreement therewith, including any adjustment in the Contract amount or the Contract time, and the full and final settlement of all costs (direct, indirect and overhead) related to the Work authorized by the Change Order.
- 2) Contractor shall promptly execute changes in the Work as directed in writing by the District even when the parties have not reached agreement on whether the change increases the scope of Work or affects the Contract Price or Contract Time. All claims for additional compensation to the Contractor shall be presented in writing. No claim will be considered after the work in question has been done unless a written contract change order has been issued or a timely written notice of claim has been made by Contractor. Contractor shall not be entitled to claim or bring suit for damages, whether for loss of profits or otherwise, on account of any decrease or omission of any item or portion of Work to be done. Whenever any change is made as provided for herein, such change shall be considered and treated as though originally included in the Contract, and shall be subject to all terms, conditions and provisions of the original Contract.
- 3) Owner Initiated Change. The Contractor must submit a complete cost proposal, including any change in the Contract time, within seven (7) Days after receipt of a scope of a proposed change order initiated by the District, unless the District requests that proposals be submitted in less than seven (7) Days.
- 4) Contractor Initiated Change. The Contractor must give written notice of a proposed change order required for compliance with the Contract Documents within seven (7) Days of discovery of the facts giving rise to the proposed change order.

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- 5) Whenever possible, any changes to the Contract amount shall be in a lump sum mutually agreed to by the Contractor and the District.
- 6) Price quotations from the Contractor shall be accompanied by sufficiently detailed supporting documentation to permit verification by the District, including but not limited to estimates and quotations from subcontractors or material suppliers, as District may reasonably request.
- 7) If the Contractor fails to submit a complete cost proposal within the seven (7) Day period (or as requested), the District has the right to order the Contractor in writing to commence the work immediately on a force account basis and/or issue a lump sum change to the Contract Price and/ or Contract Time in accordance with the District's estimate. If the change is issued based on the District estimate, the Contractor will waive its right to dispute the action unless within fifteen (15) Days following completion of the added/deleted work, the Contractor presents written proof that the District's estimate was in error.
- 8) Estimates for lump sum quotations and accounting for cost-plus-percentage work shall be limited to direct expenditures necessitated specifically by the subject extra work, and shall be segregated as follows:
 - (a) Labor. The costs of labor will be the actual cost for wages prevailing locally for each craft or type of worker at the time the extra work is done, plus employer payments of payroll taxes and insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessment or benefits required by lawful collective bargaining agreements. The use of a labor classification which would increase the extra work cost will not be permitted unless the contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.
 - (b) Materials. The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available in the quantities involved, plus sales tax, freight and delivery. Materials cost shall be based upon supplier or manufacturer's invoice. If invoices or other satisfactory evidence of cost are not furnished within fifteen (15) Days of delivery, then the Engineer shall determine the materials cost, at its sole discretion.
 - (c) Tool and Equipment Use. Costs for the use of small tools, tools which have a replacement value of \$1,000 or less shall be considered included in the markups described below. Regardless of

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ownership, the rates to be used in determining equipment use costs shall not exceed listed rates prevailing locally at equipment rental agencies, or distributors, at the time the work is performed.

(d) Overhead, Profit and Other Charges. The mark-up for overhead (including supervision) and profit on work added to the Contract shall be according to the following:

- i. "Net Cost" is defined as consisting of costs of labor, materials and tools and equipment only excluding overhead and profit. The costs of applicable insurance and bond premium will be reimbursed to the Contractor and subcontractors at cost only, without mark-up. Contractor shall provide District with documentation of the costs, including but not limited to payroll records, invoices and such other information as District may reasonably request.
- ii. For Work performed by the Contractor's forces the added cost for overhead and profit shall not exceed fifteen (15%) percent of the Net Cost of the Work.
- iii. For Work performed by a subcontractor, the added cost for overhead and profit shall not exceed fifteen (15%) percent of the subcontractor's Net Cost of the Work to which the Contractor may add five (5%) percent of the subcontractor's Net Cost.
- iv. For Work performed by a sub-subcontractor the added cost for overhead and profit shall not exceed fifteen (15 %) percent of the sub-subcontractor's Net Cost for Work to which the subcontractor and general contractor may each add an additional five (5 %) percent of the Net Cost of the lower tier subcontractor.
- iv. No additional markup will be allowed for lower tier subcontractors, and in no case shall the added cost for overhead and profit payable by District exceed twenty-five (25%) percent of the Net Cost as defined herein, of the party that performs the Work.

9) All of the following costs are included in the markups for overhead and profit described above, and Contractor shall not receive any additional compensation for: Submittals, drawings: field drawings, Shop Drawings, including submissions of drawings; field inspection; General Superintendence; General administration and preparation of cost

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proposals, schedule analysis, Change Orders, and other supporting documentation; computer services; reproduction services; Salaries of project engineer, superintendent, timekeeper, storekeeper, and secretaries; Janitorial services; Small tools, incidentals and consumables; Temporary on-Site facilities (Offices, Telephones, Internet access, Plumbing, Electrical Power, lighting; Platforms, Fencing, Water), Jobsite and Home office overhead or other expenses; vehicles and fuel used for work otherwise included in the Contract Documents; Surveying; Estimating; Protection of Work; Handling and disposal fees; Final cleanup; Other incidental Work; Related warranties; insurance and bond premiums.

- 10) For added or deducted Work by subcontractors, the Contractor shall furnish to the District the subcontractor's signed detailed record of the cost of labor, material and equipment, including the subcontractor markup for overhead and profit. The same requirement shall apply to sub-subcontractors.
- 11) For added or deducted work furnished by a vendor or supplier, the Contractor shall furnish to the District a detailed record of the cost to the Contractor, signed by such vendor or supplier.
- 12) Any change in The Work involving both additions and deletions shall indicate a net total cost, including subcontracts and materials. Allowance for overhead and profit, as specified herein, shall be applied if the net total cost is an increase in the Contract Price; overhead and profit allowances shall not be applied if the net total cost is a deduction to the Contract Price. The estimated cost of deductions shall be based on labor and material prices on the date the Contract was executed.
- 13) Contractor shall not reserve a right to assert impact costs, extended job site costs, extended overhead, constructive acceleration and/or actual acceleration beyond what is stated in the change order for work. No claims shall be allowed for impact, extended overhead costs, constructive acceleration and/or actual acceleration due to a multiplicity of changes and/or clarifications. The Contractor may not change or modify the District's change order form in an attempt to reserve additional rights.
- 14) If the District disagrees with the proposal submitted by Contractor, it will notify the Contractor and the District will provide its opinion of the appropriate price and/or time extension. If the Contractor agrees with the District, a change order will be issued by the District. If no agreement can be reached, the District shall have the right to issue a unilateral change order setting forth its determination of the reasonable additions or savings in costs and time attributable to the extra or deleted work. Such determination shall become final and binding if the Contractor fails to submit a claim in writing to the District within fifteen (15) Days of the issuance of

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the unilateral change order, disputing the terms of the unilateral change order, and providing such supporting documentation for its position as the District may require.

- 15) No dispute, disagreement or failure of the parties to reach agreement on the terms of the change order shall relieve the Contractor from the obligation to proceed with performance of the work, including extra work, promptly and expeditiously.
- 16) Any alterations, extensions of time, extra work or any other changes may be made without securing consent of the Contractor's surety or sureties.

ARTICLE 48. OCCUPANCY

The District reserves the right to occupy or utilize any portion of The Work at any time before completion, and such occupancy or use shall not constitute Acceptance of any part of Work covered by this Contract. This use shall not relieve the Contractor of its responsibilities under the Contract.

ARTICLE 49. INDEMNIFICATION

To the fullest extent allowed by law, Contractor shall defend (with Counsel of District's choosing), indemnify and hold the District, its elected officials, officers, employees, agents and authorized volunteers free and harmless from any and all claims, demands, causes of action, costs, expenses, liabilities, losses, damages or injuries, at law or in equity, regardless of whether the allegations are false, fraudulent, or groundless, to property or persons, including wrongful death, to the extent arising out of or incident to any acts, omissions or willful misconduct of Contractor, its officials, officers, employees, agents, consultants and contractors arising out of or in connection with the performance of the Work or this Contract, including claims made by subcontractors for nonpayment, including without limitation the payment of all consequential damages and attorneys' fees and other related costs and expenses. Contractor shall defend, at Contractor's own cost, expense and risk, with Counsel of District's choosing, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against District, its elected officials, officers, employees, agents and authorized volunteers. To the extent of its liability, Contractor shall pay and satisfy any judgment, award or decree that may be rendered against District, its elected officials, officers, employees, agents and authorized volunteers in any such suit, action or other legal proceeding. Contractor shall reimburse District, its elected officials, officers, employees, agents and authorized volunteers for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. The only limitations on this provision shall be those imposed by Civil Code Section 2782.

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ARTICLE 50. RECORD (“AS BUILT”) DRAWINGS

- a. Contractor shall prepare and maintain a complete set of record drawings (herein referred to as “as-builts”) and shall require each trade to prepare its own as-builts. The as-builts must show the entire site for each major trade, including but not limited to water, sewer, electrical, data, telephone, cable, fire alarm, gas and plumbing. Contractor shall mark the as-builts to show the actual installation where the installation varies from the Work as originally shown. Contractor shall mark whichever drawings are most capable of showing conditions fully and where shop drawings are used, Contractor must record a cross-reference at the corresponding location on the contract drawings. Contractor shall give particular attention to concealed elements that would be difficult to measure and record at a later date. Contractor shall use colors to distinguish variations in separate categories of The Work.
- b. Contractor shall note related change order numbers where applicable. Contractor shall organize as-builts into manageable sets, bound with durable paper cover sheets and shall print suitable title, dates and other identification on the cover of each set. Contractor to also provide an electronic version of the as-builts. The suitability of the as-builts will be determined by the Engineer.

ARTICLE 51. RESOLUTION OF CONSTRUCTION CLAIMS

- a. Contractor shall timely comply with all notices and requests for changes to the Contract Time or Contract Price, including but not limited to all requirements of Article 47, Changes and Extra Work, as a prerequisite to filing any claim governed by this Article. The failure to timely submit a notice of delay or notice of change, or to timely request a change to the Contract Price or Contract Time, or to timely provide any other notice or request required by this agreement shall constitute a waiver of the right to procedures of this Article.
- b. Effective January 1, 1991, Section 20104 et seq., of the California Public Contract Code prescribes a process utilizing informal conferences, non-binding judicial supervised mediation, and judicial arbitration to resolve disputes on construction claims of \$375,000 or less.
- c. Effective January 1, 2017, Section 9204 of the Public Contract Code prescribes a process for negotiation and mediation to resolve disputes on construction claims. The intent of this Article is to implement Sections 20104 et seq. and Section 9204 of the California Public Contract Code. This Article shall be construed to be consistent with said statutes.
- d. For purposes of this Article, “Claim” means a separate demand by the Contractor, after a change order duly requested in accordance with Article 47 “Changes and Extra Work” has been denied, for (A) a time extension, (B) payment of money or

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damages arising from work done by or on behalf of the Contractor pursuant to the Contract for a public work and payment of which is not otherwise entitled to, or (C) an amount the payment of which is disputed by the District.

- e. **Claims governed by this Article may not be filed unless and until the Contractor completes all procedures for giving notice of delay or change and for the requesting of a time extension or change order, including but not necessarily limited to the procedures contained in Article 47 “Changes and Extra Work,” and Contractor’s request for a change has been denied in whole or in part. Claims governed by this Article must be filed no later than the date of final payment.**

- f. The claim shall be submitted in writing to the District and shall include on its first page the following in 16 point capital font: “THIS IS A CLAIM.” Furthermore, the claim shall include the documents necessary to substantiate the claim. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims, including all requirements pertaining to compensation or payment for extra work, disputed work, and/or changed conditions. Failure to follow such contractual requirements shall bar any claims or subsequent lawsuits for compensation or payment thereon.

- g. **Supporting Documentation:** The Contractor shall submit all claims in the following format:
 - 1) Summary of claim merit and price, reference Contract Document provisions pursuant to which the claim is made

 - 2) List of documents relating to claim:
 - i. Specifications
 - ii. Drawings
 - iii. Clarifications (Requests for Information)
 - iv. Schedules
 - v. Other

 - 3) Chronology of events and correspondence

 - 4) Analysis of claim merit

 - 5) Analysis of claim cost

 - 6) Time impact analysis in CPM format

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- h. **District's Response.** Upon receipt of a claim pursuant to this Article, District shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Any payment due on an undisputed portion of the claim will be processed and made within 60 days after the public entity issues its written statement.
- 1) If the District needs approval from the District Board to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the claim, and the District Board does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the District shall have up to three days following the next duly publicly noticed meeting of the District Board after the 45-day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.
 - 2) Within 30 days of receipt of a claim, the District may request in writing additional documentation supporting the claim or relating to defenses or claims the District may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of District and the Contractor. The District's written response to the claim, as further documented, shall be submitted to the Contractor within 30 days (if the claim is less than \$15,000, within 15 days) after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.
- i. **Meet and Confer.** If the Contractor disputes the District's written response, or the District fails to respond within the time prescribed, the Contractor may so notify the District, in writing, either within 15 days of receipt of the District's response or within 15 days of the District's failure to respond within the time prescribed, respectively, and demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand, the District shall schedule a meet and confer conference within 30 days for settlement of the dispute.
- j. **Mediation.** Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the public entity shall provide the Contractor a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. Any disputed portion of the claim, as identified by the contractor in writing, shall be submitted to nonbinding mediation, with the public entity and the Contractor sharing the associated costs

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equally. The public entity and Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing, unless the parties agree to select a mediator at a later time.

1. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.
 2. For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.
 3. Unless otherwise agreed to by the public entity and the contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.
 4. The mediation shall be held no earlier than the date the Contractor completes the Work or the date that the Contractor last performs Work, whichever is earlier. All unresolved claims shall be considered jointly in a single mediation, unless a new unrelated claim arises after mediation is completed.
- k. If following the mediation, the claim or any portion remains in dispute, the Contractor must file a claim pursuant to Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code prior to initiating litigation. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the Contractor submits his or her written claim pursuant to subdivision (a) until the time the claim is denied, including any period of time utilized by the meet and confer conference.
- l. The following procedures are established for all civil actions filed to resolve claims of \$375,000 or less:
1. Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to non-binding mediation unless waived by mutual stipulation of both parties or unless mediation was held prior to commencement of the action in accordance with Public Contract Code section 9204 and the terms of this Agreement. The mediation process shall provide for the selection within 15 days by both parties of a

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disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court.

2. If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1114.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.
 - i. In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, (A) arbitrators shall, when possible, be experienced in construction law, and (B) any party appealing an arbitration award who does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, also pay the attorney's fees on appeal of the other party.
- m. **Government Code Claims:** In addition to any and all contract requirements pertaining to notices of and requests for compensation or payment for extra work, disputed work, construction claims and/or changed conditions, the Contractor must comply with the claim procedures set forth in Government Code Sections 900, et seq. prior to filing any lawsuit against the District. Such Government Code claims and any subsequent lawsuit based upon the Government Code claims shall be limited to those matters that remain unresolved after all procedures pertaining to extra work, disputed work, construction claims, and/or changed conditions have been followed by Contractor. If no such Government Code claim is submitted, or if the prerequisite contractual requirements are not satisfied, no action against the District may be filed. **A Government Code claim must be filed no earlier than the date the work is completed or the date the Contractor last performs work on the Project, whichever occurs first. A Government Code claim shall be inclusive of all unresolved claims unless a new unrelated claim arises after the Government Code claim is submitted.**
 - a. The District's failure to respond to a claim from the Contractor within the time periods described in this Article or to otherwise meet the time requirements of this Article shall result in the claim being deemed rejected in its entirety.

ARTICLE 52. DISTRICT'S RIGHT TO TERMINATE CONTRACT

- a. **Termination for Cause:** The District may, without prejudice to any other right or remedy, serve written notice upon Contractor of its intention to terminate this Contract if the Contractor: (i) refuses or fails to prosecute The Work or any part

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thereof with such diligence as will ensure its completion within the time required; (ii) fails to complete The Work within the required time; (iii) should file a bankruptcy petition or be adjudged a bankrupt; (iv) should make a general assignment for the benefit of its creditors; (v) should have a receiver appointed; (vi) should persistently or repeatedly refuse or fail to supply enough properly skilled workers or proper materials to complete the work; (vii) should fail to make prompt payment to subcontractors or for material or labor; (viii) persistently disregard Applicable Laws, ordinances, other requirements or instructions of the District; or (ix) should violate any of the provisions of the Contract Documents.

The notice of default and intent to terminate shall contain the reasons for termination. Unless within ten (10) Days after the service of such notice, Contractor resolves the circumstances giving rise to the notice of default to the District's satisfaction, or makes arrangements acceptable to the District for the required corrective action, this Contract shall terminate. In such case, Contractor shall not be entitled to receive any further payment until the Project has been finished. The District may take over and complete The Work by any method it may deem appropriate. Contractor and its surety shall be liable to the District for any excess costs or other damages incurred by the District to complete the Project. If the District takes over The Work, the District may, without liability for so doing, take possession of and utilize in completing The Work such materials, appliances, plant, and other property belonging to the Contractor as may be on the Project site.

- b. **Termination For Convenience:** In addition to its right to terminate this Contract for default, the District may terminate the Contract, in whole or in part, at any time upon ten (10) Days written notice to Contractor. The Notice of Termination shall specify that the termination is for the convenience of the District, the extent of termination and the effective date of such termination.

After receipt of Notice of Termination, and except as directed by the District, the Contractor shall, regardless of any delay in determining or adjusting any amounts due under this Termination for Convenience clause, immediately proceed with the following obligations:

- 1) Stop Work as specified in the Notice.
- 2) Complete any Work specified in the Notice of Termination in a least cost/shortest time manner while still maintaining the quality called for under the Contract Documents.
- 3) Leave the Site and any other property upon which the Contractor was working and upon which the facility (or facilities) forming the basis of the Contract Documents is situated in a safe and sanitary manner such that it does not pose any threat to the public health or safety.

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- 4) Terminate all subcontracts and purchase orders to the extent that they relate to the portions of The Work terminated.
- 5) Place no further subcontracts or orders, except as necessary to complete the remaining portion of The Work.
- 6) Submit to the District, within ten (10) Days from the effective date of the Notice of Termination, all of the documentation called for by the Contract Documents to substantiate all costs incurred by the Contractor for labor, materials and equipment through the Effective Date of the Notice of Termination. Any documentation substantiating costs incurred by the Contractor solely as a result of the District's exercise of its right to terminate this Contract pursuant to this clause, which costs the Contractor is authorized under the Contract Documents to incur, shall: (i) be submitted to and received by the District no later than thirty (30) Days after the Effective Date of the Notice of Termination; (ii) describe the costs incurred with particularity; and (iii) be conspicuously identified as "Termination Costs Occasioned by the District's Termination for Convenience."
- 7) District's total liability to Contractor by reason of the termination shall be limited to the total (without duplication of any items) of:
 - a) The reasonable cost to the Contractor for all Work performed prior to the effective date of the termination, determined in accordance with the force account provisions of ARTICLE 47, including the Work done to secure the Project for termination. Reasonable cost may not exceed the applicable percentage completion values derived from the progress schedule and the Cost Breakdown. Deductions shall be made for cost of materials to be retained by the Contractor, cost of Work defectively performed, amounts realized by sale of materials, and for other appropriate credits or offsets against cost of Work as allowed by the Contract Documents. Reasonable cost will include reasonable allowance for Project overhead and general administrative overhead, not to exceed five percent (5%) of the cost. Contractor shall not be entitled to reimbursement under this section for Work for which Contractor has already received, or is eligible to receive, compensation under the terms of the Contract.
 - b) When, in the District's opinion, the cost of any item of Work is excessively high due to costs incurred to remedy or replace defective or rejected Work, reasonable cost to be allowed will be the estimated reasonable cost of performing the Work in

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compliance with requirements of the Contract Documents and excessive actual cost shall be disallowed.

- c) A reasonable allowance for profit on cost of Work performed as determined in accordance with ARTICLE 47 provided that the Contractor establishes to the District's satisfaction that the Contractor would have made a profit had the Project been completed, and provided further that the profit allowed shall not exceed five percent (5%) percent of the cost. Contractor shall not be entitled to an allowance for profit on any work for which Contractor has received, or is eligible to receive, compensation under the terms of the Contract.
 - d) Reasonable costs to the Contractor of handling material returned to vendors, delivered to the District or otherwise disposed of as directed by the District.
 - e) A reasonable allowance for the Contractor's internal administrative costs in preparing termination claim.
 - f) Reasonable demobilization costs, and reasonable payments made to Subcontractors or suppliers on account of termination.
- 8) In no event shall the District be liable for unreasonable costs incurred by the Contractor or subcontractors after receipt of a notice of termination. Such non-recoverable costs include, but are not limited to, the cost of or anticipated profits on Work not performed as of the date of termination, post-termination employee salaries, unreasonable post-termination administrative expenses, post-termination overhead or unabsorbed overhead, surety costs of any type, costs of preparing and submitting the Contractor's termination claim, attorney fees of any type, and all other costs relating to prosecution of a claim or lawsuit.
- 9) The District shall have no obligation to pay the Contractor under this ARTICLE 52b (Termination for Convenience) unless and until the Contractor provides the District with updated and acceptable as-builts and Record Documents for Work completed prior to termination.
- 10) In arriving at the amount due the Contractor under this clause there shall be deducted in whole or in the appropriate part(s) if the termination is partial:

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- a) All unliquidated advances or other payments on account previously made to the Contractor, including without limitation all payments which are applicable to the terminated portion of the Contract Documents,
- b) Any claim the District may have against the Contractor in connection with the Work, and
- c) The agreed price for, or proceeds of sale of, any materials, supplies, or other things kept by the Contractor and not otherwise recovered by or credited to the District.

These provisions are in addition to and not in limitation of any other rights or remedies available to the District.

- c. **Savings Clause.** If District terminates Contractor for cause, and if it is later determined that the termination was wrongful, such default termination shall automatically be converted to and treated as a termination for convenience. In such event, Contractor shall be entitled to receive only the amounts payable under this section, and Contractor specifically waives any claim for any other amounts or damages, including, but not limited to, any claim for consequential damages or lost profits.
- d. **Exception.** Notwithstanding any other provision of this Article, when immediate action is necessary to protect life and safety or to reduce significant exposure or liability, the District may immediately order Contractor to cease Work until such safety or liability issues are addressed to the satisfaction of the District or the Contract is terminated.

ARTICLE 53. WARRANTY AND GUARANTEE

- a. Contractor warrants that all materials and equipment furnished under this Contract shall be new unless otherwise specified in the Contract Documents; and that all Work conforms to the Contract Document requirements and is free of any defect whether performed by the Contractor or any subcontractor or supplier.
- b. Unless otherwise stated, all warranty periods shall begin upon the filing of the Notice of Completion. Unless otherwise stated, the warranty period shall be for one year.
- c. The Contractor shall remedy at its expense any damage to District-owned or controlled real or personal property.
- d. Contractor shall furnish the District with all warranty and guarantee documents prior to final Acceptance of the Project by the District.

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- e. The District shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. The Contractor shall within ten (10) Days after being notified commence and perform with due diligence all necessary Work to complete or correct the Work at issue. If the Contractor fails to promptly remedy any defect, or damage; the District shall have the right to replace, repair, or otherwise remedy the defect, or damage at the Contractor's expense.
- f. In the event of any emergency constituting an immediate hazard to health, safety, property, or licensees, when caused by Work of the Contractor not in accordance with the Contract requirements, the District may undertake at Contractor's expense, and without prior notice, all actions necessary to correct such condition.
- g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for Work performed and Materials furnished under this Contract, the Contractor shall:
 - 1) Obtain for District all warranties that would be given in normal commercial practice or that are required in the Contract Documents;
 - 2) Require all warranties to be executed, in writing, for the benefit of the District; and
 - 3) Enforce all warranties for the benefit of the District, unless otherwise directed in writing by the District.

This Article shall not limit the District's rights under this Contract or with respect to latent defects, gross mistakes, or fraud. The District specifically reserves all rights related to defective work, including but not limited to the defect claims pursuant to California Code of Civil Procedure Section 337.15.

ARTICLE 54. DOCUMENT RETENTION & EXAMINATION

- a. In accordance with Government Code Section 8546.7, records of both the District and the Contractor shall be subject to examination and audit by the State Auditor General for a period of three (3) years after final payment.
- b. Contractor shall make available to the District any of the Contractor's other documents related to the Project immediately upon request of the District.
- c. In addition to the State Auditor rights above, the District shall have the right to examine and audit all books, estimates, records, contracts, documents, bid documents, subcontracts, and other data of the Contractor (including electronic records, computations and projections) related to negotiating, pricing, or performing the modification in order to evaluate the accuracy and completeness of

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the cost or pricing data at no additional cost to the District, for a period of four (4) years after final payment.

ARTICLE 55. SOILS INVESTIGATIONS

When a soils investigation report for the Project site is available, such report shall not be a part of the Contract Documents. Any information obtained from such report as to subsurface soil condition, or to elevations of existing grades or elevations of underlying rock, is approximate only and is not guaranteed. Contractor acknowledges that any soils investigation report (including any borings) was prepared for purposes of design only and Contractor is required to examine the site before submitting its bid and must make whatever tests it deems appropriate to determine the underground condition of the soil.

ARTICLE 56. SEPARATE CONTRACTS

- a. The District reserves the right to let other contracts in connection with this Work or on the Project site. Contractor shall cooperate with and permit other contractors reasonable access and storage of their materials and execution of their work and shall properly connect and coordinate its Work with theirs.
- b. To ensure proper execution of its subsequent Work, Contractor shall immediately inspect work already in place and shall at once report to the Engineer any problems with the work in place or discrepancies with the Contract Documents.
- c. Contractor shall ascertain to its own satisfaction the scope of the Project and nature of any other contracts that have been or may be awarded by the District in prosecution of the Project to the end that Contractor may perform this Contract in the light of such other contracts, if any. Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy at site of the Project. Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the Project. If simultaneous execution of any contract for the Project is likely to cause interference with performance of some other contract or contracts, the Engineer shall decide which Contractor shall cease Work temporarily and which contractor shall continue or whether work can be coordinated so that contractors may proceed simultaneously. The District shall not be responsible for any damages suffered or for extra costs incurred by Contractor resulting directly or indirectly from award, performance, or attempted performance of any other contract or contracts on the Project site.

ARTICLE 57. NOTICE AND SERVICE THEREOF

All notices shall be in writing and either served by personal delivery or mailed to the other party as designated in the Bid Forms. Written notice to the Contractor shall be addressed to Contractor's principal place of business unless Contractor designates another address in writing for service of notice. Notice to District shall be addressed to the District as

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designated in the Notice Inviting Bids unless District designates another address in writing for service of notice. Notice shall be effective upon receipt or five (5) Days after being sent by first class mail, whichever is earlier. Notice given by facsimile shall not be effective unless acknowledged in writing by the receiving party.

ARTICLE 58. NOTICE OF THIRD PARTY CLAIMS

Pursuant to Public Contract Code Section 9201, the District shall provide Contractor with timely notification of the receipt of any third-party claim relating to the Contract.

ARTICLE 59. STATE LICENSE BOARD NOTICE.

Contractors are required by law to be licensed and regulated by the Contractors' State License Board which has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four (4) years of the date of the alleged violation. A complaint regarding a latent act or omission pertaining to structural defects must be filed within ten (10) years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, P.O. Box 26000, Sacramento, California 95826.

ARTICLE 60. INTEGRATION

- a. This Contract, together with its incorporated documents, contains the entire, integrated agreement of the parties hereto, and supersedes any and all other prior or contemporaneous negotiations, understandings and oral or written agreements between the parties hereto. Each party acknowledges that no representations, inducements, promises or agreements have been made by any person which are not incorporated herein, and that any other agreements shall be void.
- b. Any modification of this Contract shall be effective in in writing signed by all parties hereto. No oral order, objection, direction, claim or notice by any party or person shall affect or modify any of the terms or obligations contained in the Contract Documents.

ARTICLE 61. ASSIGNMENT

Contractor shall not assign, transfer, convey, sublet, or otherwise dispose of this Contract or any part thereof including any claims, without prior written consent of the District. Any assignment without the written consent of the District shall be void. Any assignment of money due or to become due under this Contract shall be subject to a prior lien for services rendered or Material supplied for performance of Work called for under the Contract Documents in favor of all persons, firms, or corporations rendering such services or supplying such Materials to the extent that claims are filed pursuant to the Civil Code, the Code of Civil Procedure or the Government Code.

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ARTICLE 62. CHANGE IN NAME AND NATURE OF CONTRACTOR'S LEGAL ENTITY

Should a change be contemplated in the name or nature of the Contractor's legal entity, the Contractor shall first notify the District in order that proper steps may be taken to have the change reflected on the Contract and all related documents. No change of Contractor's name or nature will affect District's rights under the Contract, including but not limited to the bonds.

ARTICLE 63. ASSIGNMENT OF ANTITRUST ACTIONS

Pursuant to Section 7103.5 of the Public Contract Code, in entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, Contractor or subcontractor offers and agrees to assign to the District all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (chapter 2 (commencing with Section 16700) of part 2 of division 7 of the Business and Professions Code), arising from the purchase of goods, services, or materials pursuant to this Contract or any subcontract. This assignment shall be made and become effective at the time the District makes final payment to the Contractor, without further acknowledgment by the parties.

ARTICLE 64. PROHIBITED INTERESTS

No District official or representative who is authorized in such capacity and on behalf of the District to negotiate, supervise, make, accept, or approve, or to take part in negotiating, supervising, making, accepting or approving any engineering, inspection, construction or material supply contract or any subcontract in connection with construction of the project, shall be or become directly or indirectly interested financially in the Contract.

ARTICLE 65. LAWS AND REGULATIONS

- a. Contractor shall give all notices and comply with all federal, state and local laws, ordinances, rules and regulations bearing on conduct of work as indicated and specified by their terms. References to specific laws, rules or regulations in the Contract Documents are for reference purposes only and shall not limit or affect the applicability of provisions not specifically mentioned. If Contractor observes that drawings and specifications are at variance therewith, he shall promptly notify the Engineer in writing and any necessary changes shall be adjusted as provided for in this Contract for changes in work. If Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, he shall bear all costs arising therefrom.
- b. Contractor shall be responsible for familiarity with the Americans with Disabilities Act ("ADA") (42 U.S.C. § 12101 et seq.). The Work will be performed in compliance

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with ADA laws, rules and regulations. Contractor shall comply with the Historic Building code, including but not limited to, as it relates to the ADA, whenever applicable.

- c. Contractor acknowledges and understands that, pursuant to Public Contract Code section 20676, sellers of "mined material" must be on an approved list of sellers published pursuant to Public Resources Code section 2717(b) in order to supply mined material for this Contract.

ARTICLE 66. PATENT FEES OR ROYALTIES.

The Contractor shall include in its bid amount the patent fees or royalties on any patented article or process furnished or used in the Work. Contractor shall assume all liability and responsibility arising from the use of any patented, or allegedly patented, materials, equipment, devices or processes used in or incorporated with The Work, and shall defend, indemnify and hold harmless the District, its officials, officers, agents, employees and representatives from and against any and all liabilities, demands, claims, damages, losses, costs and expenses, of whatsoever kind or nature, arising from such use.

ARTICLE 67. OWNERSHIP OF DRAWING

All Contract Documents furnished by the District are District property. They are not to be used by Contractor or any subcontractor on other work nor shall Contractor claim any right to such documents. With exception of one complete set of Contract Documents, all documents shall be returned to the District on request at completion of the Work.

ARTICLE 68. NOTICE OF TAXABLE POSSESSORY INTEREST

In accordance with Revenue and Taxation Code Section 107.6, the Contract Documents may create a possessory interest subject to personal property taxation for which Contractor will be responsible.

END OF GENERAL CONDITIONS

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SPECIAL CONDITIONS

SP – 1 DIFFERING SITE CONDITIONS

In the event that site conditions are materially different than shown on the plans, reported in the geotechnical report (Appendix), or observed during the mandatory site visit, the Contractor shall promptly notify the Engineer in writing. The Engineer shall investigate the conditions, and if found that such conditions do materially differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the Work under this Contract, the Engineer will recommend to the District that an equitable adjustment be made by modifying the Contract by Addendum to account for differing site conditions.

No Claim of the Contractor under this clause or any other shall be allowed unless the Contractor has given notice as indicted above..

No Claim of the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this Contract.

SP – 2 TRAFFIC CONTROL

The Contractor is made aware that that the site enters onto Greenback Lane and Sylvan Road, which are both busy urban roads. Traffic control measures, e.g. flaggers, be required during the ingress and egress of equipment and material deliveries required for the project. Any and all cost for traffic control measures shall be paid by the Contractor.

SP – 3 SWPPP REQUIREMENTS AND RAIN DELAYS

Contractor is made aware that the project is subject to the requirements for coverage under the California Construction General Permit SWRCB Order No. 2009-009-DWQ as amended by Order 2010-0014-DWQ and Order 2012-0006-DWQ). A Storm Water Pollution Prevention Plan (SWPPP) has been prepared for the project and is included as an Appendix to these specifications. The project has been designated a RISK LEVEL 2. Contractor shall see Section 01090 REGULATORY REQUIREMENTS AND PERMITS for additional information on responsibilities.

It is anticipated that the construction schedule will require work during the designated "wet season". The Contractor shall plan and schedule all construction activities in order to minimize the exposed and disturbed area remaining prior to the start of predicted rain. This may include providing temporary cover, portions of final AB or final stabilization (pavement) in phases. Allowable temporary covers are described in the approved SWPPP. All areas shall be fully stabilized prior to predicted rain events as required by the permit.

In the event that extended rain events warrant the need to temporarily make the site inactive the Contractor will fully stabilize the site and continue monitoring as required by the General Permit and SWPPP. The Contractor will demobilize and remobilize and no

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additional cost to the District. Time extensions to the contract shall be per General Conditions Article 42b. Inclement Weather.

SP – 4 SURVEY AND CONSTRUCTION STAKING

The Contractor is made aware that the Plans contain a note specifying the project bench mark information that is to be used by the Contractor which to base their construction staking.

The Contractor shall be responsible for all construction staking necessary to layout and construct a complete project (including the water pipeline work to be completed by the District). The Contractor shall bring to the Engineers attention any issues or discrepancies between the Contractor's surveying and construction staking and that of the Contract Documents in a timely manner so as not to cause delay.

SP – 5 SUBSURFACE CONDITIONS AND COMPACTION TESTING REQUIREMENTS

A subsurface investigation has been conducted at the site of the Work. The subsurface investigation and geotechnical report were developed for planning and design purposes only, and as such may not include necessary information for, any or all, construction related activities including, but not limited to, excavations, sheeting, shoring, bracing, boring and dewatering. Contractor shall see Section 00700 GENERAL CONDITIONS Article 55 – Soils Investigations.

The resulting geotechnical report with the records of borings made at the work site is entitled:

Report of Geotechnical Investigation Corporation Yard Masterplan Phase 1, California, dated January 31, 2017, prepared by Paragon Geotechnical, Inc.

Copies of the Geotechnical Report of Subsurface and Physical Conditions are included as an Appendix to these specifications.

Initial compaction testing shall be performed at the discretion and expense of the District. Backfill not meeting compaction specifications shall be corrected by the Contractor at no additional expense to the District. Follow-up compaction testing shall be performed by the District at the expense of the Contractor. No extra time or payment shall be provided due to work delays for these tests.

Any surface settlement during the guarantee period shall be the responsibility of the Contractor.

SP – 6 USE OF STANDARDS

The District Standard Technical Specifications and Standard Details (most recent edition) are considered as part of the Contract Documents and are the primary reference for technical specifications for the construction of District projects. Any item of work not

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specified in the following Technical Specifications sections or not shown in the Bid Drawings shall be referred to the District Standards.

SASD Standard Technical Specifications and Standard Details (most recent edition) are considered as part of the Contract Documents and are the primary reference for technical specifications for the construction of sewer infrastructure related work including testing and CCTV documentation. Any item of work not specified in the following Technical Specifications sections or not shown in the Bid Drawings shall be referred to the SASD Standards.

SP – 7 DESCRIPTION OF BID ITEMS

The Bid Items listed in Section 00400 Bid Form are described in further detail in Section 01200 – Measurement and Payment. The descriptions provided are intended as a guide for measurement and payment and may not include all items or work necessary to complete the project. Any items not described, but necessary to complete the project as specified within the contract documents shall be considered included in the appropriate Bid Item.

SP – 8 DAMAGE TO PAVEMENT AND CONCRETE

The Contractor shall provide all necessary protection to existing pavement and concrete so as to avoid scraping, gouging, imprinting, cracking edges or otherwise causing damage during the entire Project. The District Inspector shall direct the contractor to repair any damage as deemed necessary. The Contractor shall repair said damage using methods required by the Inspector or shall agree to an alternative method in advance of said repairs. All costs of repairs to existing pavement and concrete due to damage caused by the Contractor shall be solely the responsibility of the Contractor.

SP-9 CONTRACTOR'S USE OF THE PROJECT SITE

The Contractor's use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities, and field offices. The existing site of Citrus Heights Water District adjacent to the project site shall be off limits.

SP –10 DISTRICT USE OF THE PROJECT SITE

When the Contractor's work involves extension to the existing facilities, the District may utilize all or part of the existing facilities during the entire period of construction for the conduct of the District's normal operations. The Contractor shall cooperate with the District to minimize interference with the District's operations and to facilitate the District's operations. In any event, the District shall have access to the project site at all times. The Contractor shall refer to SECTION 01140, Item 2.3 - **Work Constraints and Sequencing Specific to this Project.**

END OF SPECIAL CONDITIONS

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TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

"THE FOLLOWING TECHNICAL SPECIFICATIONS ARE INCORPORATED HEREIN BY REFERENCE AS IF SET FORTH IN THEIR ENTIRETY:

GENERAL SPECIFICATIONS

SECTION 01090	REGULATORY REQUIREMENTS AND PERMITS
SECTION 01110	SUMMARY OF WORK
SECTION 01140	WORK RESTRICTIONS
SECTION 01160	FIELD ENGINEERING
SECTION 01200	MEASUREMENT AND PAYMENT
SECTION 01330	SUBMITTAL PROCEDURES
SECTION 01340	REQUESTS FOR INFORMATION AND CLARIFICATION
SECTION 01354	HAZARDOUS MATERIAL PROCEDURES
SECTION 01360	ENVIRONMENTAL CONTROLS
SECTION 01380	PHOTOGRAPHS
SECTION 01400	QUALITY CONTROL AND INSPECTION
SECTION 01500	CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
SECTION 01770	CLOSE OUT PROCEDURES

TECHNICAL SPECIFICATIONS

DIVISION 2 – SITE WORK

SECTION 02000	ENVIRONMENTAL CONDITIONS – SEISMIC, WEATHER AND ELEVATIONS
SECTION 02072	DEMOLITION, ABANDONMENT, CUTTING AND PATCHING
SECTION 02200	EARTHWORK
SECTION 02575	PAVING
SECTION 02825	SECURITY GATE AND OPERATOR

DIVISION 3 – CONCRETE

SECTION 03301	CAST-IN-PLACE CONCRETE
SECTION 03400	PRE-CAST CONCRETE
SECTION 03450	PRE-CAST WALL SYSTEM
SECTION 03600	GROUT

DIVISION 4 – MASONRY

SECTION 04220	CONCRETE UNIT MASONRY
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DIVISION 5 – METALS

SECTION 05501	ANCHOR BOLTS AND EXPANSION ANCHORS
SECTION 05505	METAL FABRICATION
SECTION 05910	HOT- DIP ZINC COATING

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

DIVISION 7 – THERMAL AND MOISTURE PROTECTION
SECTION 07176 MASONRY LIQUID WATER REPELLANT
SECTION 07900 SEALANTS

DIVISION 9 – FINISHES
SECTION 09905 PAINTING AND PROTECTIVE COATINGS

DIVISION 13 – SPECIAL CONSTRUCTION
SECTION 13120 PREFABRICATED BUILDING

DIVISION 15 – MECHANICAL
SECTION 15060 PIPE AND PIPE FITTINGS
SECTION 15062 DUCTILE IRON PIPING
SECTION 15100 VALVES, COCKS, HYDRANTS AND ACCESSORIES

DIVISION 16 – ELECTRICAL
SECTION 16010 ELECTRICAL

TECHNICAL SPECIFICATIONS

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SECTION 01090

REGULATORY REQUIREMENTS AND PERMITS

PART 1 – APPLICABLE CODES

- A. See Technical Specifications for Applicable Codes.

PART 2 – SUMMARY

- A. Contractor shall comply with all the terms, conditions and requirements attached to all permits, bonds and licenses required by any local, state, or federal agencies to perform work, construct, erect, test and startup of any equipment or facility for this Contract. The Contractor shall give all notices necessary and incidental to the due and lawful prosecution of the Work.
- B. Any permits, bonds, licenses and fees therefore required for the performance of work under this Contract and not specifically mentioned herein as being obtained and paid for by the District shall be included in the Contractor's Bid price. The Contractor shall apply for and obtain all safety permits for excavations, tunneling, trenches, construction (building structure, scaffolding, or falsework) and demolition required by CAL/OSHA.
- C. The Contractor shall post at the site of Work all required permits as stipulated by the respective regulatory agency.

PART 3 – LOCAL AGENCY FEES AND PERMITS

3.01 FEES PAID BY DISTRICT

- A. If applicable to any portions of the Work, the District has applied for and obtained (or is in the process of obtaining), in its name, the necessary building and construction permits for this project. The Contractor shall be responsible for satisfying all code requirements, calling for inspections, and obtaining final approvals on behalf of the District. The Contractor shall notify the Construction Manager of the need and the readiness of all required inspections. All inspections are to be coordinated with the Construction Manager. The Contractor shall comply with all construction conditions stipulated in the permits. The Contractor shall be responsible for and the District shall not provide reimbursement for any costs required for the re-inspection of defective work or additional costs due to the Contractor's failure to properly schedule the inspections. The Contractor shall comply with the provisions of any and all permits obtained by the District and/or contained in the Appendices to these specifications.
- B. The District is not responsible for any local agency or utility permits required for temporary facilities during construction such as field office trailers and temporary electrical service for construction operations. Obtaining all such

permits and the costs associated with such permits are the responsibility of the Contractor and shall be included in the Contractor's Bid Price.

PART 4 – ENVIRONMENTAL PERMITS

- A. The Contractor shall be responsible for compliance with the following listed environmental permits and the applicable constraints for each of these permits. The Contractor shall coordinate its work relating to these permits with the Engineer. The permits are included in Appendices unless otherwise specified. The District has obtained these permits and paid for the permit fees.
1. California Environmental Quality Act (CEQA) Compliance (Exempt)
 - a. Biological Resources
 - b. Cultural Resources

PART 5 – OTHER PERMITS

- A. The District is in the process of obtaining final permits for the project. The Contractor shall be responsible for coordination with the Engineer and complying with all the terms, conditions and requirements of the final permits. The District will obtain and pay for these permits. The final permits will be provided once obtained. Contractor is responsible for reviewing standard conditions for the permits listed below and ensuring that their bid complies with all conditions.
1. City of Citrus Heights Building Permit
 2. Sacramento Area Sewer District Permit
 3. Sacramento Metropolitan Fire District Permit

PART 6 – STORM WATER QUALITY CONTROLS

6.01 GENERAL

- A. The 1972 amendments to the Federal Water Pollution Control Act established the National Pollutant Discharge Elimination System (NPDES) permit program to control discharges of pollutants from point sources. The 1987 amendments to the Clean Water Act (CWA) created a new section of the CWA devoted to storm water permitting (Section 402(p)). The EPA has delegated permitting authority to the State Water Resources Control Board (SWRCB). The SWRCB issues both general and individual permits. Construction activities are regulated under the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) provided the total amount of ground disturbance during construction is greater than or equal to 1 (one) acre. The appropriate Regional Water Quality Control Board (RWQCB) enforces the General Permit. Coverage under a General Permit requires the submission of a Notice of Intent (NOI) with the appropriate fee, annual compliance reports, a Notice of Termination (NOT) and preparation of a storm

water pollution prevention plan (SWPPP).

- B. Construction activity includes, but is not limited to: clearing, grading, demolition, excavation, construction of new structures, pipelines and reconstruction of existing facilities involving removal and replacement that results in soil disturbance. This includes construction access roads, staging areas, storage areas, stockpiles, and any off-site areas which receive run-off from the construction project such as discharge points into a receiving water.
- C. If a violation of the permit is due to the Contractor's actions or inactions and a fine is assessed, the Contractor shall be responsible for the fine.

6.02 PROJECT RISK LEVEL

- A. This project has been determined by the District, to be a Risk Level 2. The Contractor shall adhere to and implement the requirements of a Risk Level 2 project as outlined in the General Permit.

6.03 GENERAL ROLES AND RESPONSIBILITIES

- A. Legally Responsible Person (LRP): The District's Senior Engineer shall act as the project's LRP.
- B. Qualified SWPPP Developer (QSD): The District shall furnish the QSD. The QSD for this project has prepared the SWPPP document. The QSD is responsible for construction support in relation to the implementation and possible modification of the SWPPP. The District shall coordinate all contact with the QSD.
- C. Qualified SWPPP Practitioner (QSP): The Contractor shall furnish the QSP and make them responsible for the day to day implementation of the SWPPP. The QSP shall be qualified through the SWRCB or through an SQRCB approved training course. The QSP can train appropriate staff and/or subcontractors; however, the SWRCB inspectors may ask to meet and/or conduct an inspection with the QSP responsible for a particular project/site. The QSP is responsible for the implementation of BMPs on the site of the Work, not the trained superintendents or staff. The QSP shall be available by phone seven days a week, 24 hours a day, and must be able to present at the Work site within two hours of notification. When the QSP is not able to be on the site of the Work as prescribed herein, the QSP shall designate in writing to the District a trained responsible party which must be on the site of the Work when construction activities are actively taking place.
- D. The QSP shall take direction from the QSD regarding any SWPPP modifications. Modifications shall be communicated to the QSP by the District.
- E. The QSP shall be given access by the District to the SWRCB's Storm Water Multiple Application and Report Tracking System (SMARTS) for uploading and reporting requirements.
- F. At any time the QSD is required or requested to either work offsite or be onsite

due to non-compliant actions of the Contractor or the absence of the QSP, the Contractor shall reimburse the District for all related expenses incurred by the District.

- G. Within seven (7) days after receipt of the Notice of Award from the District, the Contractor shall submit the QSP's qualifications for review by the District.

6.04 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall comply with the SWRCB, RWQCB, County, City, and other local agency requirements regarding storm water management, inspection, and monitoring.

The Contractor shall be responsible for meeting the requirements of the General Permit except as specifically noted below. NOTE – No documents or testing results shall be uploaded to SMARTS without prior review and approval by the District.

The Contractor shall prepare the following in accordance with the General Permit:

- Install, construct, implement, monitor, maintain and remove upon completion all of the BMPs and other pollution prevention measures in accordance with the STORM WATER POLLUTION PREVENTION PLAN and the project risk level requirements.
- Daily visual inspections, photographs, and documentation of project site and BMPs.
- Pre- and post-rain inspections, photographs, and documentation of project site and BMPs. Preparation of pre- and post-rain reports and uploading to SMARTS.
- Preparation of quarterly inspections and reports and uploading to SMARTS.
- Preparation of annual inspections and reports and uploading to SMARTS.
- Sampling, monitoring, and reporting of storm water discharge and receiving water as required by the SWPPP and project risk level requirements (including preparation and implementation of Rain Event Action Plans (REAPs). Uploading to SMARTS.
- Non-compliance reporting of numeric exceedance levels and uploading to SMARTS.
- Preparation of NOT and uploading to SMARTS.

The Contractor shall notify the Engineer upon completion and uploading to SMARTS of all reports. These documents are subject to review and comment by the District.

Contractor shall be bound to the conditions on the Notice of Intent (NOI) that will be filed by District and will be responsible for all costs associated with the

REGULATORY REQUIREMENTS AND PERMITS

implementation of the Plan including all fines, damages and job delays incurred due to failure to implement the requirements of the Permit.

Contractor shall maintain a copy of the NOI, Plan and Permit at the Project Site at all times, and shall make the Plan available to District, Engineer, and the State Water Quality Control Board during construction activities. Contractor shall allow authorized agents of the Water Quality Control Board, State Water Resources Control Board, U.S. Environmental Protection Agency, and local storm water management personnel upon the presentation of credentials and other documents as may be required by Laws and Regulations to accomplish the following.

- Enter, at reasonable times, upon the construction site and Contractor's facilities pertinent to the Work.
- Have access to and copy, at reasonable times, any records that must be kept as specified in the permit.
- Inspect, at reasonable times, the construction site and related erosion and sediment control measures.
- Sample or monitor, at reasonable times, for the purpose of ensuring compliance with the Permit.
- Contractor shall notify the Engineer immediately following a request from any regulatory agency to enter, inspect, sample, monitor or otherwise access the Project Site or its records.

The Contractor shall be responsible for taking the proper actions to prevent storm water coming into contact with contaminants and sediments from migrating offsite or entering storm sewer drainage systems. The Contractor shall take immediate action if directed by the Engineer or if the Contractor observes contaminants and/or sediments entering the storm drainage system, to prevent further storm water from entering the system.

6.05 DISTRICT RESPONSIBILITIES

A. The District shall be responsible for the following:

- Preparing the SWPPP.
- Prepare and file the Notice of Intent (NOI).
- Furnish the Contractor with copies of the SWPPP.
- The District will submit to the RWQCB an annual report and pay the associated fee. This annual report will require the submission of the annual certification and update as required in Contractor's responsibilities above.
- Preparation and uploading of amendments to the SWPPP.

PART 7 – DEWATERING

- A. In **November of 2014**, the Central Valley Region adopted Waste Discharge Requirements Order **WQ2014-0194-DWQ** and National Pollutant Discharge Elimination System (NPDES) Permit No. **CAG140001** to regulate construction dewatering. Should the Contractor need to control groundwater by dewatering and/or depressurization of water bearing soil and rock formations, the Contractor must comply with this NPDES Permit, or any updated NPDES Permit, and all other laws and regulations having jurisdiction over construction dewatering matters including well installation/abandonment, water discharge, use of existing storm drains and natural water sources. Contractor can download a complete copy of Order **WQ2014-0194-DWQ**.
- B. http://www.waterboards.ca.gov/water_issues/programs/npdes/docs/drinking_water/final_statewide_wqo2014_0194_dwq.pdf
- C. The Contractor will be held responsible for any fines or penalties from regulatory agencies resulting from its dewatering system.
- D. Before dewatering is commenced, the Contractor shall obtain acceptance of the Construction Manager for the method, installation, monitoring, testing, removal, discharge point(s) and other system details of the Contractor's proposed dewatering system. To that end, the Contractor is to submit to the Construction Manager a complete dewatering plan prepared and signed by a Professional Engineer registered in California.

*****END OF SECTION*****

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SUMMARY OF WORK

PART 1 – GENERAL

1.01 THE WORK COVERED BY THE CONTRACT DOCUMENTS

- A. The Work consists of construction and completion of site improvement at the Citrus Height Water District Corporation Yard as described on the Contract Drawings and Specifications Corporation Yard improvements include, but is not limited to constructing a new covered vehicular wash station, two new open vacuum excavation dump pits, replacement of an existing sewer pipeline, connection to an existing sewer pipeline (new manhole and cleanout), installation of sand-oil separators for the new wash station and vacuum excavation dump pit water; a new covered material storage areas for aggregate base, sand, concrete and asphalt; new water pipelines and connections (with the exception of work to be performed by the District); new storm drain pipe and site drainage improvements including a sand-oil separator; new pavement and striping; concrete perimeter security wall and automated access gate, and all site electrical and lighting.
- B. The Contractor shall provide all labor, superintendence, materials, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies, services, security, temporary facilities, and other means of construction necessary or proper for performing and completing the Work specified in the Contract Documents. The Contractor shall perform and complete the work in the best manners that promote rapid and efficient construction activities consistent with safety of life and property, to the satisfaction of the Construction Manager, and in strict accordance with the Contract Documents.
- C. The Contractor shall comply with all codes, ordinances, regulations, orders, and other legal requirements of public authorities having bearing on the performance of the Work.

1.02 LOCATION OF PROJECT

- A. The Work is within the City of Citrus Heights at the Citrus Heights Water District Headquarters located at 6230 Sylvan Road, Citrus Heights CA 95610 as identified in the contract drawings.

1.03 DISTRICT ASSIGNED SUBCONTRACTORS AND EQUIPMENT SUPPLIERS

- A. Assignment of Subcontractors and Equipment Suppliers by District is not anticipated.

1.04 DISTRICT FURNISHED EQUIPMENT

- A. DISTRICT will furnish the following products: None.

1.05 CONTRACTOR FURNISHED ITEMS

- A. The Contractor shall be responsible for furnishing all materials, labor, and equipment used in the construction of the project. This includes paying all cost associated with these materials, including but not limited to tax; freight and handling; other associated fees.

1.06 ACTIVITIES AND WORK BY OTHERS

- A. District, utilities, and others may perform activities within Project area while the Work is in progress. District crews will install the new 12-inch waterline from the tie-in point to the 2-inch blow-off just south of the new entrance. See the project plans for delineation of work between the District and the Contractor.
 - 1. Contractor shall schedule the Work with District, utilities, and others to minimize mutual interference.
 - 2. Contractor should note that the District anticipates completing the water pipeline work prior to the start of construction. In the event that the District does not complete this work prior to the start of construction, it is anticipated that the work will take between 3-4 weeks. Contractor shall work with the District and schedule all work accordingly.
- B. Activities by others which may affect performance of work include:
 - 1. Normal daily operation of the existing facilities by District's personnel.
- C. Cooperate with others to minimize interference and delays.
 - 1. When cooperation fails, submit recommendations and perform Work in coordination with work of others as directed.

1.07 COORDINATION OF WORK

- A. Maintain overall coordination of the Work.
- B. Obtain construction schedules from each subcontractor, and require each subcontractor to maintain schedules and coordinate modifications.
- C. Contractor shall coordinate all inspections by the City of Citrus Heights and the Sacramento Area Sewer District as necessary to review and approve permitted work. Contractor is responsible to obtain all final approvals.

1.08 CONTRACTOR STAGING AREAS

- A. The District will not be providing any staging area beyond the limits of the construction site. The Contractor shall incorporate their staging area within the construction site area, and schedule and arrange their construction activity accordingly. If the contractor needs additional staging area the Contractor is responsible for locating and obtaining any agreements necessary for

Section 01110
SUMMARY OF WORK

additional staging areas necessary to complete the project.

- B. Contractor shall provide copies of all fully executed staging area agreements. All agreements shall name the District as additionally insured.
- C. Contractor is responsible for all storm water pollution control measures required for staging areas.
- D. Prior to release of retention and final payment the Contractor is required to provide written proof that the staging area has been accepted by the property following project completion.

*****END OF SECTION*****

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SECTION 01140

WORK RESTRICTIONS

PART 1 – GENERAL SEQUENCING AND CONSTRAINTS

- A. Work Sequence and Constraints described hereinafter are critical events in work sequence which are presented to underscore the importance of proper sequencing, scheduling and coordination. The work sequence and constraints presented do not describe all items affecting the completion of the Work, but are intended to describe important events necessary to minimize disruption of the existing facilities.

PART 2 – INTERRUPTION OF DISTRICT OPERATIONS

2.01 GENERAL REQUIREMENTS

- A. The Work shall be bid, scheduled and constructed in such a manner as to result in the least possible disruption to the District's normal operations.
- B. At no time shall the District's existing facilities and offices be out of water service. If the Contractor determines that the water service need to be shutoff to perform a tie-in, the Contractor must coordinate with the Construction Manager and the District a minimum of two (2) weeks in advance of needing the water shutoff. Shutoff must not last for more than two hours.
- C. Prior to any shutdown all materials, fittings, equipment and tools shall be on the site and all necessary skilled labor scheduled prior to starting any connection work.
- D. Planned utility service shutdowns to any service shall be accomplished during periods of minimum use. In some cases this will require night or weekend work, which shall be at no additional cost to the District. The Contractor shall program work so that service will be restored in the minimum possible time and shall cooperate with the District in reducing shutdowns of the utility to a minimum. No utility shall be disconnected without prior written approval from the utility owner and Construction Manager. When it is necessary to disconnect a utility, the Contractor shall give at least two (2) weeks' notice to the utility owner and to the Construction Manager for approval of the proposed schedule.
- E. The Contractor shall note that only certain structures, tie-ins and constraints are addressed in this section. All work, whether or not addressed here, shall be governed by applicable parts of this section, and schedules and procedures further submitted for approval.

2.02 OUTAGE SUBMITTAL REQUIREMENTS

- A. The Contractor shall submit to the Construction Manager a detailed outage plan and time schedule for operations at least two (2) weeks prior to the need

for outage. The outage plans shall be coordinated with the construction schedule and shall meet the Contractor's planned method. All costs for preparing and implementing both the outage and contingency plans shall be borne by the Contractor.

2.03 WORK CONSTRAINTS AND SEQUENCING SPECIFIC TO THIS PROJECT

- A. The Contractor is made aware of the following order of work is to be schedule and coordinated with the District. The Contractor may propose an alternative approach for review and approval by the District.
1. The District utilizes the Schuman Lane entrance for tractor-trailer material deliveries. The contractor shall coordinate with the District a minimum one (1) week in advance when this entrance would be obstructed for material delivery.
 2. The District crews will install the new 12-inch pipeline from the tie-in to the 2-inch blow-off just south of the new entrance. The Contractor shall coordinate this work with the District to avoid any conflict.
 3. The Contractor shall be responsible for preparing and having approved a flushing and disinfecting test for the potable water lines in accordance with the Specifications and District Standards. The District shall be responsible for conducting the Bacteriological Test (Bac-T) and having the sample tested. The Contractor shall schedule the Bac-T testing with the District so as to avoid causing a delay to the construction schedule.
 4. The Contractor shall be responsible for preparing and having approved a plan for testing and TV Inspections for the sewer and drainage systems (complete). Sewer system testing and TV Inspections (both the private and public sewer) shall meet current SASD Standards. Drainage system testing and TV Inspections shall meet current Sacramento County Standards (Section 38).
 5. Contractor is responsible for all coordination with the Sacramento Area Sewer District (SASD) during installation of the manhole connection to the existing sewer system. All work (including testing and TV Inspections) shall be done per SASD standards and require their final approval.
 6. Contractor is responsible for coordination with all property owners that may be affected by the sewer manhole connection work (including any required shutdowns of the sewer pipeline).

2.04 WORK BY OTHERS

- A. Only District personnel shall operate existing water valves.

PART 3 – OTHER WORK RESTRICTIONS AND COORDINATION REQUIREMENTS

3.01 WORK HOURS

- A. Work hours shall conform to all applicable Federal, State, County, and local laws, ordinances, and codes applicable to the work. Where any of these laws are in conflict, the more stringent requirements shall be followed.
- B. The Contractor shall schedule all work activities in accordance with the Citrus Height Water District normal hours of operation 7:00 a.m. and 5:00 p.m., Monday through Friday, with Saturdays, Sundays, and District Holidays being excluded. The Contractor shall indicate the need for non-normal work hours in the various schedules submitted during the progress of the Project.
- C. The work restriction includes deliveries of materials and equipment and servicing of construction equipment on the project site. Any work outside this time frame shall be allowed only with prior written permission from the District's Representative. The actual time the District's personnel, Construction Manager or Engineer spend working outside this time frame shall be billed to the Contractor at the personnel's standard charge out rate. Any work designated to have a special time frame shall be so noted on the Plans and/or elsewhere in these Specifications and shall be excluded from this reimbursement.
- D. Should the Contractor perform work outside of the standard hours of 7:00 a.m. and 5:00 p.m., Monday through Friday without the District's written permission, the District will charge the Contractor, as a penalty, five hundred dollars (\$500.00) for each infraction. This charge will be deducted from the next progress payment due Contractor.
- E. Each and every day the Contractor is not going to perform any work, the Contractor shall by 9:00 a.m. review the entire site, considering all situations, and leave a message with the District and Construction Manager that the site has been reviewed and the site is secure. Should any mitigation be necessary, the Contractor should also advise the Inspection Section.

3.02 RIGHTS-OF-WAY

- A. No additional easements are required for the project. The Contractor shall perform all work within approved boundaries (no work outside of the District property lines).

3.03 EXISTING UTILITIES

- A. The Contractor shall be responsible for potholing all known utilities shown on the plans to verify their location and depth at least one (1) week in advance of beginning any major construction activities. The types, location, sizes and/or depths of the existing underground utilities as shown on the plans were obtained from sources of varying reliability. The Contractor is cautioned that only actual excavation will reveal the type, extent, sizes, location and depth of

Section 01140
WORK RESTRICTIONS

such underground utilities. If a utility is damaged, the Contractor shall immediately report such damage to the District. Utilities not identified to be abandoned shall be repaired to the District's satisfaction.

- B. A minimum of 48 hours in advance of excavation activities, the Contractor shall contact the following parties to ascertain and verify the existence and location of utility lines and facilities and shall coordinate all work in accordance with the information obtained from such inquiries in order to prevent damage to such lines and facilities:

Underground Service Alert (USA) (1-800-642-2444)

- C. Prior to conducting any excavation, the Contractor shall contact the appropriate regional notification center as required by Government Code Section 4216. In accordance with Government Code Section 4215, the Contractor shall be compensated for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating existing main or trunk line utility facilities not indicated in the Contract Plans and Specifications with reasonable accuracy, and for the equipment on the project necessarily idled during such work; provided that the Contractor shall first notify the Agency before commencing work on locating, repairing damage to, removing or relocating such utilities.
- D. The Engineer or his representative has endeavored to determine the existence of utilities at the work site from the records of the owners of known utilities in the vicinity of the work. The positions of these utilities, as derived from such records, are shown on the Plans. The service connections to these utilities may not be shown on the Plans.
- E. The Contractor shall make his own investigations, including exploratory excavations, to determine the locations and type of existing service laterals or appurtenances when their presence can be inferred from the presence of other visible facilities, such as buildings, meters and junction boxes, on or adjacent to the work site.
- F. The cost for protecting existing utilities and facilities shall be included in the Contractors bid prices.

3.04 REMOVAL, RELOCATION, OR PROTECTION OF EXISTING UTILITIES

- A. The Contractor shall be responsible for protecting all existing utilities and facilities in-place that are not identified to be demolished, removed, or relocated. The cost for protecting existing utilities and facilities shall be included in the Contractors bid prices. Should any utilities and/or facilities be damaged the Contractor shall immediately report such damaged and be responsible for all cost, labor, materials, and equipment to repair or replace the damaged utility or equipment.

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WORK RESTRICTIONS

- B. Sewer pipeline sections that do not directly interfere with the Contractor's work may be abandoned by crushing or filling the pipe with slurry. All pipelines that must be removed for the performance of the work shall be disposed of per these specifications and applicable standards.

3.05 FINAL PAVEMENT AND OVERLAY

- A. In the event that final pavement and/or the overlay cannot be performed by the substantial completion date listed and/or the District determines that temperatures are not adequate the Contractor shall perform the following:
- place the intended aggregate base and additional aggregate base as needed to provide a gradual slope to each facility and off set finished grade.
 - return the following Spring to re-grade, place additional aggregate base and make the final paving as was originally intended at no additional cost to the District.
 - The District will withhold payment for final pavement until all work is complete and accepted by the District.

*****END OF SECTION*****

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SECTION 01160

FIELD ENGINEERING

PART 1 – GENERAL

1.01 DATUM

- A. Vertical and horizontal datum are based on the coordinates and benchmarks shown on the Drawings or as provided by District prior to the start of construction. The Contractor is to locate and protect District furnished control points prior to starting the Work and preserve control points during construction. The Contractor shall re-establish all control points disturbed by its operations at no cost to District.
- B. The Contractor shall establish other vertical and horizontal control from these District furnished reference points as required to properly layout and construct the Work.
- C. The Contractor's layout shall be based upon existing structures and the vertical and horizontal datum established by the District.
- D. The Contractor shall be responsible for the preservation of all existing survey monuments or permanent bench marks. Any monuments or bench marks disturbed or destroyed by Contractor shall be referenced and replaced by a licensed land surveyor. A corner record or record of survey, as appropriate, shall be filed by the licensed land surveyor as required by the Land Surveyor's Act with the appropriate local government agencies.

1.02 QUALITY ASSURANCE

- A. The Contractor's Surveyor shall be a land surveyor registered in California or civil engineer qualified and licensed in California with at least five (5) years surveying experience of similar projects.
- B. Dimensions for all existing structures, piping, paving, and other nonstructural items are taken from the available information during the District's planning and design. The Contractor shall field verify all dimensions and conditions in advance of any construction in the area. Any discrepancy between the field survey by the Contractor and the information indicated in the Contract Documents shall be immediately brought to Construction Manager's attention by written notification. In all questions arising as to proper location of lines and grades, the Construction Manager's decision will be final.
- C. Accuracy of the Contractor's stakes, alignments and grades may be periodically and randomly checked by the Construction Manager. If requested by Construction Manager, the Contractor shall supply field labor as required, at no extra charge to District, to aid and assist the Construction Manager in checking location and grades of the work as set by the Contractor. This shall

include postponing parts of the Work affected by survey check, moving materials and equipment that interfere with a clear line of sight between horizontal control points and the construction work. The Contractor is not to assume that Construction Manager's check substitutes or complements the Contractor's required field quality control procedures.

- D. The Contractor's registered land surveyor shall check the line and grade of the slab or footing concrete forms prior to the first slab or footing pour at each structure and building.

1.03 PROJECT SURVEY REQUIREMENTS

- A. As part of the bid price for the construction of the improvements the Contractor shall provide and be responsible for the layout of all work specified in the contract. The Contractor shall provide all necessary surveys, field staking, and positioning for the construction of all components at the proper alignment, elevations, grades, and positions, as indicated on the Drawings and as required for the proper operation and function.
- B. The Contractor shall stake the work limits and easement lines prior to the start of sitework.
- C. The Contractor shall lay out all work, including structures, pipelines, and other facilities and shall be solely responsible for executing the Work in accordance with the lines and grades indicated.

1.04 SUBMITTALS

- A. Contractor shall furnish the Construction Manager one copy of all land surveyor notes, calculations, sketches and drawings within 48 hours after completion of each survey task.

1.05 RECORD DOCUMENTS

- A. The Contractor is to prepare, maintain and submit Record Documents as specified in **Section 01770- CLOSEOUT PROCEDURES**. The Contractor's land surveyor is to affix his signature and registration number to applicable record drawings certifying the accuracy of lines and grades shown.

*****END OF SECTION*****

SECTION 01200

MEASUREMENT AND PAYMENT

PART 1 – MEASUREMENT AND PAYMENT

1.01 GENERAL

- A. Measurements of the completed work shall be in accordance with, and by instruments and devices calibrated to United States Standard Measures and the units of measurement for payment, and the limits thereof, shall be made as shown on the Plans, Specifications, General Contract Provisions, General Specifications, Special Provisions.
- B. All costs associated with any wage increases that may take place during the duration of the project shall be included in the bid. No changes to the contract price shall be allowed due to a wage increase.
- C. All pavement restoration, both temporary and permanent, shall be hot mix asphalt per City of Citrus Heights standards.

1.02 UNITS OF MEASUREMENT

- A. Measurements shall be in accordance with U.S. Standard Measurements. A pound is an avoirdupois pound. A ton is 2,000 pounds avoirdupois. The unit of liquid measure is the U.S. Gallon.

1.03 CERTIFIED WEIGHTS

- A. When payment is to be made on the basis of weight, the weighing shall be done on certified platform scales, or when approved by the Construction Manager, on a completely automated weighing and recording system. The Contractor shall furnish the Construction Manager with duplicate licensed weighmaster's certificates showing the actual net weights. The District will accept the certificates as evidence of the weights delivered.

1.04 METHODS OF MEASUREMENT

- A. Materials and items of work which are to be paid for on the basis of measurement shall be measured in accordance with the method stipulated in the particular sections involved or the description of Bid Items found in 5.0 of this Section. In determining quantities, all measurements shall be made in a horizontal plane unless otherwise specified.
- B. Material not used from a transporting vehicle shall be determined by the Construction Manager and deducted from the certified tag.
- C. When material is to be measured and paid for on a volume basis and it would be impractical to determine the volume, or when requested by the Contractor in writing and approved by the Construction Manager in writing, the material will be weighed and converted to volume measurement for payment purposes.

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MEASUREMENT AND PAYMENT

Factors for conversion from weight measurement to volume measurement will be determined by the Construction Manager and shall be agreed to by the Contractor before such method of measurement of pay quantities will be adopted.

- D. Full compensation for all expense involved in conforming to the above requirements for measuring and weighing materials shall be considered as included in the unit prices paid for the materials being measured or weighed and no additional allowances will be made therefore.
- E. Quantities of material wasted or disposed of in a manner not called for under the Contract; or rejected loads of material, including material rejected after it has been placed by reason of failure of the Contractor to conform to the provisions of the Contract; or material not unloaded from the transporting vehicle; or material placed outside the lines indicated on the plans or given by the Construction Manager; or material remaining on hand after completion of the Contract, will not be paid for and such quantities will be deducted from the final total quantities. No compensation will be allowed for hauling rejected material.

1.05 LUMP SUM MEASURE MEASUREMENT

- A. Lump sum items will be measured and paid on a percent complete basis, as determined by the Construction Manager.
- B. The Contractor shall provide a schedule of values showing a complete break down for the lump sum items to accommodate partial pay requests. The schedule of values shall be submitted to the Engineer within 10 days after the notice to proceed for review and approval.

1.06 PAYMENT

- A. Payment includes: Full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.07 DEFECT ASSESSMENT

- A. All Work, portions of Work, and materials which do not conform to the specified requirements and have been rejected shall be remedied, or removed and replaced by the Contractor in an acceptable manner. No compensation will be allowed for such removal, replacement, or remedial work.
- B. The Engineer is the representative of the District and has full authority to assess defects and identify proper pay adjustments. The Engineer's decisions on such matters shall be final and conclusive.

1.08 NON-PAYMENT FOR REJECTED PRODUCTS

- A. Payment will not be made for any of the following:

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MEASUREMENT AND PAYMENT

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected products.
7. Products or planting incorrectly handled, installed, or planted.

PART 2 – DESCRIPTION OF BID ITEMS

2.01 SUMMARY

- A. The Bid Amounts for each Bid Item will be used for comparative bid analysis. The Bid amounts will also form the basis of monthly progress payments. Each Lump Sum bid amount will undergo further breakdown based on the Contractor Schedule of Values. Refer to Section 6 below. Bid items are not intended to be exclusive description of work categories and the Contractor shall determine and include in its pricing all materials, labor, and equipment necessary to complete each Bid Item as shown and specified.

2.02 DESCRIPTION OF BID ITEMS

A. BID ITEM 1 – PERMITS AND INSURANCE

1. Measurement – The bid item includes obtaining all necessary insurance and paying for all necessary permits for this project beyond what has been/will be obtained by the District. The District has obtained coverage under the Construction General Permit for this project. This includes all coordination efforts necessary with the District for final permit approvals with all agencies. This also includes all coordination efforts with the City of Citrus Heights, Sacramento Metropolitan Fire District and the Sacramento Area Sewer District regarding inspections and final acceptance of work.
2. Payment - Full Compensation by Lump Sum will be made within the first pay request provided the Contractor submits all necessary contract documentation and it has been accepted by the District.

B. BID ITEM 2 – MOBILIZATION AND DEMOBILIZATION

1. Measurement –
 - a. The bid item for mobilization shall be no more than three percent (3%) of the total contract amount. This includes, but is not limited to, site preparation; temporary facilities and supplies necessary to complete the work defined in the Contract Documents; mobilization of labor, materials, equipment, and other incidentals necessary to perform the Contract work.

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MEASUREMENT AND PAYMENT

- b. The demobilization shall not exceed two percent (2%) of the total bid item price. Demobilization shall include, but is not limited to, site cleaning and restoration of surfaces within the job site, removal of all temporary facilities and equipment from the work area, disconnection of the temporary construction utilities and turnover of project to the District. In the event the Contractor writes in a Mobilization/Demobilization price greater than five percent (5%) on Section 00400 Bid Form, the District will pay any excess with the final Progress Payment.
 2. Payment – Mobilization and Demobilization will be paid by Lump Sum based on the estimated percentage complete for each as agreed to by the Construction Manager.
- C. BID ITEM 3 – SHEETING, SHORING, AND BRACING
 1. Measurement -
 - a. Consists of providing sheeting, shoring and bracing for below-grade excavations and above-grade construction as is necessary to provide a safe work environment for the workers. The Contractor shall be responsible for the proper application of sheeting, shoring, and bracing as required at any trench and vertical construction location.
 - b. The Contractor shall refer directly to Title 8 of the California Code of Regulations and the Labor Code, produced by the State of California Department of Industrial Relations and the Cal/OSHA Consultation Service Research and Education Unit, for detailed information regarding the regulation’s scope, specifications, and exceptions and for other requirements that may be applicable to their operations.
 - c. The bid item for sheeting, shoring, and bracing shall be no more than one percent (1%) of the total contract amount.
 2. Payment - Full Compensation by Lump Sum based on the estimated percentage complete as agreed to by the Construction Manager.
- D. BID ITEM 4 – STORM WATER POLLUTION PREVENTION PLAN IMPLEMENTATION
 1. Measurement -
 - a. Work consists of furnishing all labor, all materials, and equipment necessary to comply with the District’s SWPPP and be in compliance with the States Construction General Permit. The Contractor shall be responsible for providing a qualified SWPPP practitioner and conducting all site inspection and reports in accordance with the State CGP. The Contractor shall coordinate their inspections with the District, and be responsible for preparing and uploading all reports to SMARTs upon review by the District.

MEASUREMENT AND PAYMENT

- b. The bid item for the storm water pollution prevention plan implementation shall be no more than one percent (2%) of the total contract amount.
2. Payment - Full Compensation by Lump Sum based on the percent complete as agreed to by the Construction Manager for implementing and maintaining the SWPPP and all reporting requirements.

E. BID ITEM 5 – DEMOLITION AND ABANDONMENT

1. Measurement -

- a. Work includes clearing and preparing the site for the installation of the new facilities in accordance with the Contract Documents. This includes, but not limited to, clearing and grubbing; removal and disposal of the existing CMU wall including foundation; removal and disposal of the perimeter fence and gates of varying material type; removal and disposal of the existing 6” sewer pipe (or demolition by crushing or slurry fill as required) , cleanouts and services and manhole as required for the work; removal and disposal of a portion of existing 12” storm drain pipe and inlet structure; and capping a portion of the existing 2” PVC water line.
2. Payment - Full Compensation by Lump Sum for all demolition complete. Paid on a percent complete basis.

F. BID ITEM 6 – SITE GRADING

1. Measurement –

- a. Work consist of grading the site to the elevations and contours specified on the Plans. This includes, but is not limited to, providing all labor, materials, equipment; excavation and backfill operations required to meet finish grade; importing or exporting materials as necessary; material disposal; and all other incidental work necessary. The Contractor shall be responsible for verifying this quantity and determining the amount of import materials necessary to establish the finish grade shown on the Plans. This includes all work for grading at the existing vactor pits as shown on the plans.
 - b. The Contractor shall be responsible for determining a legal disposal site for materials disposal. The contractor shall be responsible for importing or disposal of any materials necessary to establish the grades shown on the Plans. This bid item shall also include all cost for material transport and disposal.
 - c. This includes providing a licensed California survey who will be responsible for all site surveying and construction staking necessary to establish grades, establish facility footprint, and utility alignments and depths.
2. Payment – Full Compensation by Lump Sum for establishing all final grades

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complete. Paid on a percent complete basis.

G. BID ITEM 7 – SITE PAVEMENT AND STRIPING

1. Measurement –

- a. This includes the placement of 10.5” minimum of Class 2 Aggregate Base and 4” minimum of C2-PG64-10 Asphalt Concrete within the limits shown on the plans and any other asphalt work as shown on the plans (curbs, transition to existing and new pavement, etc.). This work includes, but is not limited to, repairing existing paving, furnishing all labor, equipment, and materials; saw cutting the existing asphalt to a vertical edge; tack; placement and spreading of materials; compaction and rolling; excess material removal; and site cleaning.
- b. This includes the placement of thermoplastic striping in accordance with the Plans and Specifications and placement of paint for fire lane striping per Sacramento Metropolitan Fire District standards (as shown on the plans). This includes, but not limited to, furnishing all labor, equipment, and materials; thermoplastic striping materials; and placement of all striping to the Districts satisfaction.

2. Payment - Full Compensation by Lump Sum for final pavement and striping complete. Paid on a percent complete basis.

H. BID ITEM 8 – DECORATIVE RETAINING WALL

1. Measurement –

- a. This includes the installation of the decorative retaining wall where shown on the Plans. This includes, but is not limited to, providing all labor, materials, and equipment; freight; preparing and forming the foundation; leveling pad; concrete; retaining block; anchor pins; geotextile fabric, and all other incidentals necessary to install a complete block retaining wall in accordance with these Plans and the manufactures’ recommendation.

2. Payment – Full compensation by Lump Sum for a complete block retaining wall.

I. BID ITEM 9 – PERIMETER SOUND WALL AND MOTOR OPERATED GATE

1. Measurement –

- a. This work includes the installation of the concrete perimeter sound wall and motor operated gate complete. This includes, but is not limited to, providing all labor, materials, and equipment; fabrication and freight; footing and foundation excavation and form work; rebar reinforcing; concrete, decorative molds; wrought iron wall toppers and anchor bolts; sliding security gate and track; motorized gate opener and accessories (including 2 key pedestals); wiring for power and providing a stub out for connection to the District controls; installation and testing of the gate.

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Work also includes any temporary fencing necessary to secure the site during installation of the wall and all chain link fence necessary to connect the end of the concrete wall to the existing District chain link fence. The Contractor shall ensure that the site is secure at all times and that there are no gaps in the perimeter wall/fencing. All permanent chain link fence used shall match the District's existing fence.

- b. Electrical wiring and connection from the District's control system to the motor operated gate will be paid under Bid Item 10.
 - 2. Payment – Full Compensation by Lump Sum for finishing and installation of the perimeter sound wall and motor operated gate complete.
- J. BID ITEM 10 – SITE ELECTRICAL AND CONTROL PANEL

- 1. Measurement –
 - a. This work includes the installation of all site electrical and lighting as shown on the Plans. This includes, but is not limited to, providing all labor, materials, and equipment to install all wiring and wiring accessories, switches, receptacles, conduit; lighting and lighting fixtures; light poles and foundation pedestals; control panels; breakers; trench excavation and backfill.
 - b. This includes the connection to the new motor operated gate complete.
 - c. The restoration of any pavement will be covered under Bid Item 7.
- 2. Payment – Full compensation by Lump Sum for a complete and operational electrical and lighting system.

K. BID ITEM 11 – SITE WATER DISTRIBUTION PIPING

- 1. Measurement – This work includes providing all labor, material, equipment and the installation of a complete water system consisting of, but not limited to, the following features as shown on the Plans:
 - a. Connection to the District installed 2" Reduced Pressure Backflow Prevention (RPBP) Assembly; piping, fitting and valves as specified; concrete form work; rebar reinforcement; concrete, and protection barricade per District Standard FH-685 where shown on the Plans. Includes installation of the bollards for the RPBP and bollards for the fire hydrants and the backflow enclosure. This also includes installing valve boxes at each of the District and Contractor installed valve locations (as shown on the plans) and all raising/lowering of valve boxes as necessary to complete the final grading and pavement work.
 - b. Installing the 2" distribution line from the new District installed 2" RPBP to the new vehicle wash facility, vector disposal facility, and material storage facility. This includes, but is not limited to, valves; PVC Schedule 80 piping; fittings, bends, and connections; 1.5-inch yard hydrant assemblies and all necessary piping and fittings to make the

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connections; concrete form work; concrete pad, protection barricades where shown on the Plans; and 2" capped stub out.

- c. This includes preparing and having approved a pressure testing procedure and performing a successful pressure test of the new potable water system from the RPBP to the termination points at each new facility in accordance with the Specifications and District Standards.
 - d. This includes preparing and having an approved flushing and disinfection procedure and implementing the disinfection procedure from the RPBP to the termination points at each new facility in accordance with the Specifications and District Standards. The Contractor shall be responsible for coordinating with District who will perform a Bacteriological Test this portion of the potable water distribution system and successfully passing the Bacteriological Testing.
2. Payment – Full compensation by Lump Sum for a complete and operational potable water system.

L. BID ITEM 12 – WASH AND VACTOR PIT DRAIN SEWER SYSTEM

1. Measurement – This work includes providing all labor, material, and equipment and the installation of a complete vehicle wash and vactor pit drain sewer system consisting of, but not limited to, the following features as shown on the Plans:
 - a. At the vehicle wash facility the work includes, but is not limited to, the installation of the 1000-gal sand/oil separator; 6" SDR35 pipe and connection to the new 6" sewer main, concrete encased 6" DI pipe; new pre-cast drain inlet within the wash facility; new 6" SDR35 sewer lateral for future structure; cleanouts; excavation; and bedding, backfill, and compaction.
 - b. At the vactor pit facility work includes, but is not limited to, the installation of the 500-gallon sand/oil separator; 4" DI pipe camlock pump connection/cleanout assembly, 4" gate valve and 4" DI pipe to the sand/oil separator; 4" SDR35 sewer lateral pipe; connections to the new vactor pit facility, sand/oil separator, and connection to the 6" sewer main; excavation; and bedding, backfill, and compaction.
 - c. This includes providing a CCTV inspection and testing of each piping system in accordance with the Specifications.
2. Payment – Full compensation by Lump Sum for a complete and operational drain sewer system.

M. BID ITEM 13 – INSTALL NEW SEWER PIPELINE AND INSTALL NEW MANHOLE CONNECTION

1. Measurement – This work consists of installing the new 6" SDR 35 PVC sewer pipeline, cleanouts and manhole connection to the existing sewer system complete in accordance with the Plans and Specifications. This

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includes, but is not limited to, providing all labor, materials, and equipment; excavation; bedding, backfill, and compaction; installing the new 6" PVC sewer pipe; fittings and couplings; installing sewer cleanouts; 48-inch sewer manhole and cleanout per Sacramento Area Sewer District (SASD) Standards (including material requirements); and connection to existing 6" sewer pipeline. Note that all pipe materials located within the SASD easement shall be Vitrified Clay Pipe (VCP) per SASD standards. Also includes all coordination efforts and final acceptance from SASD.

- a. This includes providing a CCTV inspection and testing of each piping system in accordance with the Specifications. All testing and TV inspections for the sewer pipeline (private and public) shall be per SASD standards.
2. Payment – Full compensation by Lump Sum for a complete and operational sewer system accepted by SASD.

N. BID ITEM 14 – SITE DRAINAGE SYSTEM

1. Measurement – This work consists of installing the new site drainage system complete in accordance with the Plans and Specifications. This includes, but is not limited to, providing all labor, materials, and equipment; excavation; bedding, backfill, and compaction; installing the new 12" C900 PVC drain pipe; fittings and couplings; installing drain inlet assemblies; 5000-gallon sand/oil separator; and connection to existing 12" storm drain.
 - a. This includes providing a CCTV inspection and testing of each piping system in accordance with the Specifications.
2. Payment – Full compensation by Lump Sum for a complete and operational site drainage system.

O. BID ITEM 15 – VACTOR DISPOSAL PITS AND MIXING FACILITY

1. Measurement –
 - a. This work consists of installing the vactor disposal pits and mixing facility complete in accordance with the Plans and Specifications. This includes, but is not limited to, providing all labor, materials, and equipment; excavation; foundation preparation and soil compaction; foundation base material; installation and removing the concrete form work; rebar reinforcement; structural concrete, slab support; precast parking curb; and all other incidentals. Note that the 4" DI pipe and concrete encasement and connection to the sewer system is included in Bid Item 12.
 - b. This work consists of the installation of all miscellaneous metal rails complete. This includes, but is not limited to, the fabrications and freight of all miscellaneous metal railings, hose rack, and anchor bolts and epoxy.
2. Payment – Full compensation by Lump Sum for a complete vactor disposal

pits and mixing facility.

P. BID ITEM 16 – VEHICLE WASH FACILITY

1. Measurement –

- a. This work consists of installing the vehicle wash facility complete in accordance with the Plans and Specifications. This includes, but is not limited to, providing all labor, materials, and equipment; excavation; foundation preparation and soil compaction; foundation base material; concrete reinforcement; structural concrete; concrete piers, foundation, and concrete slab; masonry walls; metal structure; standing seam metal roofing; gutters and downspouts; hose racks; anchor bolts and epoxy, and all other incidentals necessary for a complete installation. Note that the pre-cast drain inlet, 6” ductile iron drain pipe and concrete encasement, and connection to the sand/oil separator are included in Bid Item 12.
- b. All facility electrical and lighting will be paid under Bid Item 10.
- c. Potable water pipe and yard hydrant assemblies will be paid under Bid Item 11.

2. Payment – Full compensation by Lump Sum for a complete vehicle wash facility.

Q. BID ITEM 17 – MATERIAL STORAGE FACILITY

1. Measurement –

- a. This work consists of installing the material storage facility complete in accordance with the Plans and Specifications. This includes, but is not limited to , providing all labor, materials, and equipment; excavation; foundation preparation and soil compaction; foundation base material; concrete reinforcement; structural concrete; installing and removal of concrete form work; reinforced concrete slab; reinforced concrete walls and columns; steel baffles, anchor bolts, and connectors; steel building standing; seam metal roofing; rain gutters, downspouts, and drain pipe; hose rack; and all other incidentals necessary for a complete installation.
- b. All facility electrical and lighting will be paid under Bid Item 10.
- c. Potable water pipe will be paid under Bid Item 11.

2. Payment – Full compensation by Lump Sum for a complete material storage facility.

PART 3 – CONTRACTOR'S COST BREAKDOWN

- A. For work to be performed for a lump sum amount, the Contractor shall submit a cost breakdown to the Construction Manager prior to the first payment and within ten (10) days after Notice to Proceed. The cost breakdown, as agreed upon by the Contractor and the Construction Manager, shall be used for

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preparing future estimates for partial payments to the Contractor, and shall list the major items of work with a price fairly apportioned to each item. If there is not a separate Bid Item for MOBILIZATION/DEMobilIZATION, then mobilization, demobilization, overhead, bond, insurance, other general costs and profit shall be prorated to each item so that the total of the prices for all items equal the lump sum price. At the discretion of the Construction Manager, mobilization, bond and insurance costs may be provided for separately if accompanied by invoices to verify actual expenses.

- B. The cost breakdown shall be generally in the same format as the Contract specifications divisions and subdivisions, with major items of work listed individually. The cost breakdown shall be by structure, civil, landscaping, or other logical division of work. The cost breakdown for architectural, structural, mechanical, and electrical work shall include separate items for identifiable portions of the structures. The cost breakdown shall include separate allowances for any testing and startup work required. Measurable approximate quantities of work performed by the Contractor or its subcontractors shall be provided. For quantities that are the sum total of several individual quantities, backup summaries shall be provided which list the individual descriptions and quantities. These summaries then will be used to determine the quantities of work in place in subsequent progress payment requests.
- C. The above is a statement of the intent of the Contract Documents to provide a high level of detail, acceptable to the Construction Manager, to allow a fair and reasonable estimate to be made of the value of work installed. The detail of the cost breakdown must be sufficient to provide timely processing of the monthly progress payment request.
- D. The cost breakdown will be subject to the approval of the Construction Manager, and upon request, the Contractor shall substantiate the price for any or all items and provide additional level of detail, including quantities of work. The cost breakdown shall be sufficiently detailed to permit its use by the Construction Manager as one of the bases for evaluating requests for payments. The Construction Manager shall be the sole judge of the adequacy of the cost breakdown.
- E. The cost breakdown shall be solely used to determine progress payments. The cost breakdown shall not be considered in determining payment or credit for additional or deleted work.

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SECTION 01330

SUBMITTAL PROCEDURES

PART 1 – GENERAL

- A. Where required by the Contract Documents, the Contractor shall submit descriptive information that will enable determination of whether the Contractor's proposed materials, equipment, or methods of work are in general conformance to the design concept and in compliance with the Contract Documents. The information to be submitted shall consist of drawings, specifications, descriptive data, certificates, samples, test results and such other information, all as specifically required in the specifications. In some instances, specified submittal information describes some, but not all, features of the material equipment, or method of work. Features not requiring submittals shall be as specified.
- B. Submittal review shall be only for general conformance with the design concept and general compliance with the information given in the contract documents. It shall not include review of quantities, dimensions, weights or gages, fabrication processes, construction safety precautions, all of which are the sole responsibility of the Contractor. Review of a specific item shall not indicate acceptance of an assembly of which the item is a component. The Construction Manager and/or Engineer shall not be required to review and shall not be responsible for any deviations from the contract documents not clearly noted by the Contractor, nor shall the Construction Manager and/or Engineer be required to review partial submissions or those for which submissions for correlated items have not been received.
- C. The Contractor may authorize material or equipment suppliers to deal directly with the Construction Manager with regard to such submittals; however, ultimate responsibility for the accuracy and completeness of the information contained in the submittal shall remain with the Contractor.

PART 2 – CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the materials and equipment incorporated into the Work, or the methods of performing the Work shall be as described in the accepted submittals.
- B. The Contractor shall verify that all features of all products conform to the specified requirements. Submittal documents shall be clearly edited to indicate only those items, models, or series of equipment that are being submitted for review. All extraneous materials shall be crossed out or otherwise obliterated.
- C. The Contractor shall ensure that there is no conflict with other submittals and notify the Construction Manager in each case where his submittal may affect the work of another contractor or the District. The Contractor shall coordinate

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submittals among its subcontractors and suppliers including those submittals complying with unit responsibility requirements specified in applicable technical sections.

- D. The Contractor shall coordinate submittals with the work so that work will not be delayed. He shall coordinate and schedule different categories of submittals, so that one will not be delayed for lack of coordination with another. No extension of time will be allowed because of failure to properly schedule submittals. The Contractor shall not proceed with work related to a submittal until the submittal process is complete. This requires that submittals for review and comment shall be returned to the Contractor stamped "No Exceptions Taken" or "Make Corrections Noted." The Contractor assumes the risk of expense and delays when proceeding with work that hasn't met this requirement.
- E. The Contractor shall certify on each submittal document that it has reviewed the submittal, verified field conditions, and complied with the contract documents.
- F. The Contractor shall include a copy of the applicable specification section, with addendums and all referenced sections included with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from the specification requirements. Check Marks (√) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal.

2.01 SUBMITTAL AND MATERIAL LIST

- A. Within fifteen (15) days after the Notice to Proceed, and prior to the pre-construction meeting and submission of the initial shop drawings, the Contractor shall submit a draft Schedule of Submittal List of all required submittals to the Construction Manager for favorable review. The Schedule of Submittal List shall include a description of each item, Specification reference and the anticipated submittal date. The List shall include all items of equipment and materials for architectural, structural, mechanical, piping, electrical, heating and ventilating, equipment piping, and plumbing work; and the names of manufacturers with whom purchase orders have been placed. Items on the List shall be arranged in the same order as in these Specifications, and shall contain sufficient data to identify precisely the items of material and equipment the Contractor proposes to furnish. The List shall reference the applicable

Specification section or Drawing. After the submission is favorably reviewed and returned to the Contractor by the Construction Manager, it shall become the basis for the submission of detailed manufacturer's drawings, catalog cuts, curves, diagrams, schematics, data, and information on each separate item for review. No work shall proceed on any item until it has been submitted and favorably reviewed. An incomplete submittal list is not a basis for avoiding a submittal required by the specifications.

2.02 DEFINITIONS

- A. Manufacturer's Instructions: Instructions, stipulations, directions, and recommendations issued in printed form by the manufacturer of a product addressing handling, installation, erection, and application of the product; Manufacturer's Instructions are not prepared especially for the Work.
- B. Shop Drawings: Drawings, diagrams, schedules, and other data specially prepared for the Work to illustrate some portion of the Work. Shop drawings include, but not necessarily be limited to:
 - 1. Custom-prepared data such as fabrication or erection/installation (working) drawings.
 - 2. Scheduled information, setting diagrams, actual shop work manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications, as applicable to the Work.
- C. Product Data: Illustrations, standard schedules, performance charts, brochures, diagrams and other information to illustrate materials or equipment for some portion of the Work.
 - 1. Product data as specified in individual Sections, and as applicable to the Work shall include, but not necessarily be limited to:
 - a. Standard prepared data for manufactured products (sometimes referred to as catalog data or "cuts").
 - b. Manufacturer's product specifications.
 - c. Installation instructions.
 - d. Availability of colors and patterns.
 - e. Manufacturer's printed statements of compliance and applicability.
 - f. Roughing-in diagrams and templates.
 - g. Product photographs.
 - h. Standard wiring diagrams.
 - i. Performance curves and operational-range diagrams.
 - j. Production or quality control inspection and test reports and certifications, and mill reports.

- k. Operating and maintenance instructions and recommended spare parts listing and printed product warranties.
- D. Samples: Physical examples which illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged. Samples specified in individual Sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens of coordination of visual effect, graphic symbols and units of work to be used by the Engineer or others for independent inspection and testing, as applicable to the Work.

2.03 PROCEDURES

- A. The Contractor shall deliver submittals to the Construction Manager at the address provided to Contractor by the Construction Manager. The Contractor is required to allow adequate time in its project schedule for the preparation and review of the submittal to ensure that the submittal will serve its intended purpose. The Contractor is encouraged to mark the submittal “high”, “normal” or “low” priority to assist the reviewer in prioritizing the submittal reviews during periods of high volume of submissions.
- B. Transmittal Form - Unless otherwise specified, submittals regarding material and equipment shall be accompanied by a transmittal form. A separate transmittal form shall be used for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which the submittal is required. Submittal documents common to more than one piece of equipment shall be identified with all the appropriate equipment numbers. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole. The specification section and subsection or paragraph to which the submittal is related shall be indicated on the transmittal form.
- C. Assign each submittal a unique number. Clearly note the submittal numbers on the transmittal. Number each submittal with the identifying specification section, followed by a sequential number that represents the Contractor's assigned number of 1.0, 2.0, et cetera. Resubmittals shall be numbered by replacing zero after decimal with 1, 2, 3, et cetera to the original submittal number, depending on the number of times the submittal has been resubmitted. For example: if Submittal 03300-1.0 requires a resubmittal, the first resubmittal will bear the designation “03300-1.1” and the second resubmittal will bear the designation “03300-1.2” and so on.
- D. Submit required number of copies of submittal per 00700 General Specifications Article 9. Should the Contractor require more returned copies of any particular submittal, the Contractor shall furnish an equal greater

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number of copies to the Construction Manager than is specified.

- E. Provide or furnish products and execute the Work in accordance with accepted submittals, unless in conflict with Contract Documents.
- F. Deviations From The Contract – If the submittals show any deviations from the Contract requirements, the Contractor shall submit with the submittal submission a separate written description of such deviations and the reasons therefore. If the District accepts such deviation, the District shall issue an appropriate Contract Change Order, except that, if the deviation is minor, or does not involve a change in price or in time of performance, a Change Order need not be issued. If any deviations from the Contract requirements are not noted on the submittal, the review of the shop drawing shall not constitute acceptance of such deviations.

2.04 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

- A. Submit Shop Drawings, Product Data, Samples, and other pertinent information in sufficient detail to show compliance with specified requirements.
- B. Check, verify, and revise submittals as necessary to bring them into conformance with Contract Documents and actual field conditions.
 - 1. Determine and verify quantities, dimensions, specified design and performance criteria, materials, catalog numbers, and similar data.
 - 2. Coordinate submittal with other submittals and with the requirements of the Contract Documents.
- C. Field Verification: Prior to submitting shop drawings, Contractor shall have determined and verified all field measurements, elevations, potential conflicts, quantities and dimensions. This verification may require potholing.
- D. After completion of checking, verification, and revising; stamp, sign and date submittals indicating review and approval; and submit to Construction Manager.
 - 1. Stamp and signature indicates Contractor has satisfied shop drawing review responsibilities and constitutes Contractor's written approval of shop drawing.
 - 2. Shop drawings without Contractor's written approval will be returned for resubmission.
- E. Shop Drawings: Submit three (3) copies.
- F. Product Data and Manufacturer's Instructions: Submit four (4) copies. Excise or cross out non-applicable information and clearly mark applicable information with citations to and terminology consistent with Contract Documents.
 - 1. One (1) copy will be returned with reviewer's comments and stamp.

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- G. Samples: Submit two (2) samples labeled with reference to applicable Contract Documents. Label will be returned with reviewer's selection when appropriate, comments and stamp. Samples will not be returned unless return is requested in writing and additional sample is submitted.
- H. Special Samples: Submit one (1) sample labeled with reference to applicable Contract Documents. Sample and one (1) label will be returned for installation in the Work.

2.05 MANUFACTURER'S INSTRUCTIONS

- A. Submit manufacturer's instructions whenever made available by manufacturers and when installation, erection, or application in accordance with manufacturer's instructions is required by the Specifications. Submit manufacturer's instructions prior to installation, erection, or application of equipment and other project components. Submit manufacturer's instructions in accordance with requirements for Product Data.

2.06 ENGINEER'S REVIEW

- A. The Engineer's review of submittals shall not release Contractor from Contractor's responsibility for performance of requirements of Contract Documents. Neither shall Engineer's review release Contractor from fulfilling purpose of installation nor from Contractor's liability to replace defective work. The Contractor shall not consider submittals as Contract Documents. The purpose of submittals is to demonstrate how Contractor intends to conform to the Contract Documents and design concepts. Engineer will be entitled to rely upon the accuracy or completeness of designs, calculations, or certifications made by licensed professionals accompanying a particular submittal whether or not a stamp or seal is required by Contract Documents or Laws and Regulations.
- B. The Engineer's review of shop drawings, samples, or test procedures will be only for conformance with design concepts and for compliance with information given in Contract Documents. The Engineer's review does not extend to:
 - 1. Accuracy of dimensions, quantities, or performance of equipment and systems designed by Contractor.
 - 2. Contractor's means, methods, techniques, sequences, or procedures except when specified, indicated on the Drawings, or required by Contract Documents.
 - 3. Safety precautions or programs related to safety which shall remain the sole responsibility of the Contractor.
- C. Except as may be provided in subsequent specifications, a submittal will be returned within thirty (30) calendar days. When a submittal cannot be returned within that period, Construction Manager will, within a reasonable time after

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receipt of the submittal, give notice of the date by which that submittal will be returned. The returned submittal shall indicate on the following actions:

1. If the review indicates that the material, equipment or work method complies with the project manual, submittal copies will be marked "NO EXCEPTIONS TAKEN." In this event, the Contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal.
2. If the review indicates limited corrections are required, copies will be marked "MAKE CORRECTIONS NOTED." The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in O&M data, a corrected copy shall be provided.
3. If the review reveals that the submittal is insufficient or contains incorrect data, copies will be marked "AMEND AND RESUBMIT." Except at its own risk, the Contractor shall not undertake work covered by this submittal until it has been revised, resubmitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."
4. If the review indicates that the material, equipment, or work method does not comply with the project manual, copies of the submittal will be marked "REJECTED - SEE REMARKS." Submittals with deviations that have not been identified clearly may be rejected. Except at its own risk, the Contractor shall not undertake the work covered by such submittals until a new submittal is made and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."
5. If the submittal information does not require a review by the Engineer, copies of the submittal will be marked "Review not Required" and will be returned without review.

2.07 REVIEW COSTS

- A. The District's cost for review of submittals for the same proposed materials, equipment or work shall be apportioned as follows:
 1. The cost of review of the initial submittal and the first revised submittal will be borne by the District.
 2. The cost to review all additional revised submittals after the first revised submittal will be charged to the Contractor. The cost of review shall include, without limitation, administrative, design and engineering activities directly related to review of submittals.
 3. If a submittal is approved and the Contractor elects to submit an alternate item for review for the same application, the Contractor shall be responsible for the review costs for the alternate submittal. The cost of review shall include, without limitation, administrative, design and engineering activities directly related to review of submittals.

2.08 SUBMITTALS FOR INFORMATION OR RECORD ONLY

- A. Where specified, the Contractor shall furnish three (3) copies of informational submittals to the Construction Manager. Incomplete or inadequate product data, test/inspection reports will be returned to the Contractor for re-submittal. The Contractor is to pay for all mill and factory tests that are required in the Contract Documents. No copies of informational submittals will be returned unless they are found to be incomplete or inadequate.

2.09 SUBSTITUTES OR “OR EQUAL” ITEMS AND PRODUCT OPTIONS

- A. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function, and quality required. Unless the name designated a “sole source” and/or is followed by words indicating that no substitution is permitted, materials, or equipment of other Suppliers may be accepted by Engineer if sufficient information is submitted by Contractor to allow Engineer to determine that the material or equipment proposed is equivalent or equal to that named.
- B. The procedure for review by Engineer will include the following as may also be supplemented in the Contract Documents. Requirements for review of substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor. If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall make written application to the Construction Manager for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice Contractor’s achievement of Substantial Completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with District for Work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair, and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by Engineer in evaluating the proposed substitute. The District may require Contractor to furnish at Contractor’s expense additional data about the proposed substitute.
- C. If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, sequence, technique or procedure of

Section 01330
SUBMITTAL PROCEDURES

construction acceptable to Engineer, if Contractor submits sufficient information to allow Engineer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by Engineer will be similar to that provided in Section 01330 – Submittals.

- D. All requests for substitution shall be submitted within thirty-five (35) calendar days after award of the contract. The Engineer will be allowed a reasonable time within which to evaluate each proposed substitute. The Engineer and District will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without Engineer's prior written acceptance that will be evidenced by either a Change Order or an accepted Shop Drawing. District may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute. Contractor shall pay all costs for redesign required by the implementation of the proposed substitute.

2.010 LIST OF INITIAL SUBMITTALS

The Contractor shall submit, at a minimum, the following items for District review approval prior to the beginning of the Project:

Submittal List

<u>Item Description</u>	<u>Submittal Summary</u>
Bonding and Insurance Requirements	Per the Contract Agreement
Schedule of values	Lump Sum Cost Breakdown
Schedule of Submittals	List of material submittals and dates
Project Schedule and Sequencing	10-Days following Notice to Proceed
SWPPP – QSP Certification	10-Days following Notice to Proceed
Pre-Construction Photos	Minimum 1-week before any construction activity
Injury and Illness Prevention/Hazard Plan	10-Days following Notice to Proceed

The contractor's schedule of submittals shall be a complete list of all materials to be used on the project

*****END OF SECTION*****

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SECTION 01340

REQUESTS FOR INFORMATION AND CLARIFICATIONS

PART 1 – GENERAL

- A. Should the Contractor discover conflicts, omissions, or errors in the Contract Documents, or have any questions concerning interpretation or clarification of the Contract Documents, or if it appears to the contractor that work to be done or any matter relative thereto are not sufficiently detailed or explained in the Contract Documents, then, before proceeding with the work affected, the Contractor shall immediately notify the Construction Manager in writing and request interpretation, clarification, or additional detailed instructions concerning the work. The Contractor shall ask for any clarification or request for information immediately upon discovery, but no less than fifteen (15) days prior to the start date of the activities related to the clarification, based on the latest updated and accepted construction schedule. Contractor shall be responsible for its costs to implement and administer RFI's throughout the Contract duration. Regardless of the number of RFI's submitted, Contractor will not be entitled to additional compensation.
- B. A RFI is not to be used for request for materials/equipment substitutions or value engineering/cost reduction incentive proposals.

PART 2 – RFI PROCEDURES

2.01 CONTRACTOR REVIEW AND SUBMITTAL

- A. Contractor's review
 - 1. Before submitting each RFI, the Contractor shall carefully review the following for relevant information:
 - a. All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto.
 - b. All materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work.
 - c. All information relative to means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto.
 - d. The coordination of each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.
 - e. The Contract Documents.

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REQUEST FOR INFORMATION
AND CLARIFICATION

f. The Project correspondence and documentation.

B. Submittal requests

1. The Contractor shall submit all requests for clarification and/or additional information in writing through the Construction Manager to the Engineer. A request for information (RFI) form will be supplied by the Construction Manager. Contractor shall provide a detailed written statement that indicates the specific Drawings or Specifications in need of clarification and the nature of the clarification requested.
2. Contractor shall furnish three (3) copies of each RFI. Digital copies shall also be submitted. With prior approval from the Construction Manager the Contractor may submit electronic copies only. Each RFI shall be dated and bear a signed certification that Contractor has performed the review defined above. No consideration for review by Construction Manager of any RFI will be made for any item which has not been certified by the Contractor. All non-certified RFI's will be returned to Contractor without action taken by Engineer, and any delays caused thereby shall be the total responsibility of Contractor.
3. Each RFI shall be limited to one subject.

2.02 RFI NUMBERING SYSTEM

- A. The Construction Manager will assign blocks of numbers for the Contractor, Engineer, District's Representative, and for substitutions. The Contractor will use the block of numbers consecutively with the date of issue, except for re-issuance of a respective RFI in which the subscript A, B, C, etc., will be added until the RFI is resolved. If Contractor believes the RFI reviewer's response is incomplete, Contractor shall issue another RFI (with the same RFI number with the letter "A" indicating if it is a follow-up RFI) to Construction Manager clarifying original RFI. Additionally, Construction Manager may return RFI requesting additional information should original RFI be inadequate in describing condition.

2.03 DISTRICT'S RFI REVIEW AND RESPONSE TIME

- A. Except as may otherwise be provided herein, the Construction Manager will return one copy of each RFI form to Contractor, with its comments noted thereon or on a separate comment sheet, within a reasonable amount of time, but no more than fifteen (15) calendar days following their receipt from Contractor, or if it is necessary to extend this period, the Construction Manager shall notify the Contractor in writing as to when a decision will be provided.
- B. Engineer's review will be only to provide clarification and interpretation of the Contract Documents. Engineer's review shall not relieve Contractor for the responsibility for compliance with the Contract Documents.

Section 01340
REQUEST FOR INFORMATION
AND CLARIFICATION

- C. Engineer's review will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto.
- D. The Engineer may furnish additional detailed written instructions to further explain the work, and such instructions shall be a part of the contract documents. Should additional detailed instructions in the opinion of the Contractor constitute work in excess of the scope of the contract, the Contractor shall submit notification immediately and written notification thereof to the Construction Manager no more than seven (7) days following receipt of such instruction, and in any event prior to the commencement of work thereon. If the Construction Manager considers it justified, the instructions of the Engineer will be revised or a proposed change order will be issued for the District's consideration. The Contractor shall have no claim for additional compensation or extension of the schedule because of any such additional instructions unless the Contractor provides the Construction Manager written notice thereof within the time frame specified above. In addition, the Contractor shall within fifteen (15) days from the date of notification provide detailed justification and analysis as well as complete pricing and schedule CPM fragmentary network to support any request for time extension.
- E. Should the Contractor proceed with the work affected before receipt of a response from the Construction Manager, any portion of the work which is not done in accordance with the District's interpretation, clarifications, instructions, or decisions subject to removal or replacement and the Contractor shall be responsible for all losses.
- F. RFI's will not be recognized or accepted, if in the opinion of the Construction Manager or Engineer, that one of the following conditions exists:
 - 1. The Contractor submits an RFI as a submittal.
 - 2. The Contractor submits the RFI under the pretense of a contract documents discrepancy or omission without thoroughly reviewing the documents. In this case, the Contractor shall be responsible for both the Construction Manager's and Engineer's administrative costs to process the RFI. Such costs will be deducted from Contractor's progress payments.
 - 3. The Contractor submits the RFI in a manner that suggests that specific portions of the contract documents are assumed to be excluded, or be taken as an isolated portion of the contract documents in part rather than whole.
 - 4. The Contractor submits an RFI in an untimely manner without proper coordination and scheduling of work or related trades.
- G. The Engineer's review shall not relieve Contractor from the entire responsibility for any variation from the requirements of the Contract

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Documents unless Contractor has in writing called attention to each such variation at the time of each RFI submittal and Engineer has given written approval of each such variation by specific written notation thereof incorporated in the RFI review; nor will any review by Engineer relieve Contractor from responsibility for compliance with the requirements for careful review above.

*****END OF SECTION*****

SECTION 01354

HAZARDOUS MATERIAL PROCEDURES

PART 1 – GENERAL

- A. This section includes procedures required when encountering hazardous materials at the Work site.

PART 2 – REFERENCES

- A. California Health and Safety Code, Section 25117.
- B. State of California Code of Regulations (CCR).
 - 1. Title 8. Industrial Relations.
 - a. Division 1. Department of Industrial Relations.
 - 2. Title 22. Social Security
 - a. Division 4. Environmental Health.
 - b. Division 4.5. Environmental Health Standards for the Management of Hazardous Waste.
- C. United States Code of Federal Regulation (CFR), Title 29 and Title 40.
 - 1. 29 CFR 1910.1000.
 - 2. 29 CFR 1910.134.

PART 3 – SUBMITTALS

- A. Written notification to the Construction Manager describing the Hazardous Material(s) encountered.
- B. Submit laboratory reports, hazardous material removal plans, and certifications.

PART 4 – HAZARDOUS MATERIALS PROCEDURES

- A. Hazardous materials are those defined by the State of California Health and Safety Code, Section 25117.
- B. When Hazardous Materials Including Contaminated Soil Have Been Found:
 - 1. Prepare and initiate implementation of plan of action.
 - 2. Notify immediately Construction Manager, and other affected persons.
 - 3. Notify such agencies as are required to be notified by Laws and Regulations with the times stipulated by such Laws and Regulations.
 - 4. Designate a Certified Industrial Hygienist to issue pertinent instructions

HAZARDOUS MATERIAL PROCEDURES

5. and recommendations for protection of workers and other affected persons' health and safety.
 6. Identify and contact subcontractors and licensed personnel qualified to undertake storage, removal, transportation, disposal, and other remedial work required by, and in accordance with laws and regulations.
- C. Forward to Construction Manager, copies of reports, permits, receipts, and other documentation related to remedial work.
- D. Assume responsibility for worker health and safety, including health and safety of Subcontractors and their workers.
1. Instruct workers on recognition and reporting of materials that may be hazardous.
- E. File requests for adjustments to Contract Times and Contract Price due to the finding of Hazardous Materials in the Work site in accordance with Exhibit E – Supplementary General Conditions, Item 2
1. Minimize delays by continuing performance of the Work in areas not affected by hazardous materials operations.

4.01 INJURY AND ILLNESS PREVENTION/HAZARD COMMUNICATION

- A. The Contractor shall maintain written “Injury and Illness Prevention,” “Confined Space Entry,” and “Hazard Communications” programs and shall provide the District with documentation of same prior to the execution of the Agreement for Construction Services.

4.02 ASBESTOS MATERIALS

- A. It is the specific intent of these Contract Documents to exclude from the Work any and all products or materials containing asbestos. No new products containing asbestos shall be incorporated in the Work.
- B. The Contractor is made aware that the existing underground piping may contain asbestos concrete (AC) materials. The Contractor shall anticipate the need for removal of sections of the existing pipe during tie-in to the existing system and abandonment of the existing pipelines where indicated on the Plans.
- C. All Asbestos Concrete (AC) Pipe shall be handled and disposed of according to California Code of Regulations (CCR) Title 8, Section 1529; or most current regulations. Contractor shall provide a plan for disposal of the AC pipe and provide evidence of proper disposal to the Construction Manager.

*****END OF SECTION*****

SECTION 01360

ENVIRONMENTAL CONTROLS

PART 1 – SITE MAINTENANCE

A. The Contractor shall keep the work site, staging areas, and Contractor's facilities clean and free from rubbish and debris and shall comply with the requirements of Section 01090- 3.0, **STORMWATER QUALITY CONTROLS** and the Storm Water Pollution Prevention Plan. Materials and equipment shall be removed from the site when they are no longer necessary. Upon completion of the work and before final acceptance, the work site shall be cleared of equipment, unused materials, and rubbish to present a clean and neat appearance.

1. Cleanup

- a. Waste material of any kind will not be permitted to remain on the site of the work or on adjacent streets. Immediately upon such materials becoming unfit for use in the work, they shall be collected, carried off the site and disposed of by the Contractor.
- b. The Contractor shall keep all buildings and areas occupied by the Contractor clear of all refuse, rubbish and debris that may accumulate from any source and shall keep them in a neat condition to the satisfaction of the Construction Manager.
- c. In the event that waste material, refuse, debris and/or rubbish are not so removed from the work by the Contractor, the District reserves the right to have the waste material, refuse, debris and/or rubbish removed and the expense of the removal and disposal charged to the Contractor.
- d. Paints, solvents, and other construction materials shall be handled with care to prevent entry of contaminants into storm drains, surface waters, or soils.

2. Street cleaning

- a. The Contractor shall be responsible for preventing dirt and dust from escaping from trucks departing the project site, by covering dusty loads, washing truck tires before leaving the site, or other reasonable methods.
- b. When working dump trucks and/or other equipment on paved areas and roadways, the Contractor will be required to clean said paved areas or roadways as required by the Construction Manager to remove dirt caused by the Contractor's activities. The use of water in amounts, which result in mud on public streets or that could enter drain facilities, is not acceptable as a substitute for sweeping or other methods. Equipment for this operation shall be available at the job site within 2-hours upon request.

- c. In the event that the above requirements are violated and no action is taken by the Contractor after notification of infraction by the Construction Manager, the District reserves the right to have the paved areas and roadways in question cleaned by others and the expense of the operation charged to the Contractor.

PART 2 – TREE AND PLANT PROTECTION

A. Temporary tree protection

1. The Contractor shall carefully protect existing trees from damage by construction activities, unless specifically indicated to be removed. No trees outside the construction limits shall be removed or damaged, unless authorized by the Construction Manager.
2. The District plans to place temporary protective fencing (orange fence) around existing trees to be protected prior to the start of construction. The Contractor is required to maintain this fencing and replace as necessary to provide continuous protection throughout the project duration.
3. If a tree is damaged or destroyed by construction (other than those designated for removal), the Contractor shall replace it in species, size and grade with a healthy tree as directed by the Construction Manager. Where it is necessary to replace a tree damaged by construction, the Contractor shall bear all expenses required to establish the replacement tree and paying City of Citrus Heights tree removal fees.

B. Cultivated areas and other surface improvements:

1. All landscaped areas and other surface improvements which are damaged by actions of the Contractor shall be restored. The Contractor shall minimize vegetation removal. Areas shall not be cleared until construction activities require the work. Erosion controls shall be in place prior to clearing and grading activities.

C. Other areas to be protected:

1. The Contractor shall erect a protective fence around the areas to be protected. The protective fence shall be 4 feet tall, international orange high density polyethylene resin (Visi-Barrier or equal). Posts shall be heavy duty steel T-posts with corrosion resistant coating spaced at 5 feet on centers.

PART 3 – WATER CONTROL

A. Temporary pumping and drainage

1. The Contractor shall conform to the regulations and requirements of legally authorized surface water management agencies.
2. The Contractor shall be responsible for keeping trenches and other areas free from water as required to permit continuous progress of, or to prevent damage to, its own work or the work of others. The Contractor's operations

Section 01360
ENVIRONMENTAL CONTROLS

shall be conducted in such a manner as to prevent sediment from reaching existing sewers, storm drains, and creeks.

3. The Contractor shall cover exposed excavated areas and spoils piles when runoff from rain is or would be likely to cause turbidity to enter local waterways. The Contractor shall suspend work in the rain if such work cannot be performed without causing turbid runoff.
4. To avoid solids or turbid runoff from entering local waterways, the Contractor shall cover, secure, and/or berm excavated area and spoils piles and employ other methods as necessary such as hay bale around storm drains or around construction sites; use of cut and cover construction method; or use of sedimentation basins.

B. WATER QUALITY MEASURES:

1. Erosion control measures, such as silt fences, filter fabric, sedimentation ponds, placement of hay bales along the peripheries of construction sites, temporary detention ponds, and terraced slopes, shall be employed as appropriate in conformance with the approved Storm Water Pollution Prevention Plan (SWPPP) or Water Pollution Control Plan (WPCP) and shall be in place prior to any clearing or grading activity.

PART 4 – OIL SPILL PREVENTION AND CONTROL

4.01 GENERAL

- A. The Contractor shall be responsible for prevention, containment, and cleanup of spilling of oil, fuel, and other petroleum products used in the Contractor's operations. All such prevention, containment, and cleanup costs shall be borne by the Contractor. The Contractor shall not discharge oil, fuel, or other petroleum products from equipment or facilities into surrounding waters or onto adjacent land.

4.02 SPILL MITIGATION MEASURES

- A. The Contractor shall, at a minimum, take the following measures regarding oil spill prevention, containment, and cleanup:
1. Fuel hoses, lubrication equipment, hydraulically operated equipment, oil drums, and other equipment and facilities shall be inspected regularly for drips, leaks, or signs of damage, and shall be maintained and stored properly to prevent spills. Proper security shall be maintained to discourage vandalism.
 2. All land-based oil and products storage tanks shall be diked or located so as to prevent spills from escaping to the water. Diking and subsoils shall be lined with impervious material to prevent oil from seeping through the ground and dikes.
 3. All visible oils on land shall be immediately contained using dikes, straw

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ENVIRONMENTAL CONTROLS

bales, or other appropriate means and removed using sand, ground clay, sawdust, or other absorbent material, which shall then be properly disposed of by the Contractor. Waste materials shall be temporarily stored in drums or other leak-proof containers after cleanup and during transport to disposal. Waste material shall be disposed of property at an approved site.

PART 5 – DISCOVERY OF CULTURAL RESOURCES

- A. If discovery is made of items of historical archaeological or paleontological interest, the Contractor is to immediately cease all Work in the area of discovery and promptly notify the Construction Manager. Archaeological indicators may include, but are not limited to, dwelling sites, locally darkened soils, stone implements or other artifacts, fragments of glass or ceramics, animal bones, human bones and fossils. Do not resume Work in the area of discovery until authorization is received from the Construction Manager. When work is resumed, excavation or other activities shall be as directed by the Construction Manager. If the discovery of cultural resources causes a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work the District shall cause to be issued a change order under the procedures provided in the General Conditions.

*****END OF SECTION*****

SECTION 01380

PHOTOGRAPHS

PART 1 – GENERAL

- A. Photographs before, during and after construction are an important record of site conditions, construction progress, as-built features and significant planned/unplanned events. The Contractor is to employ a competent photographer to record this important factual information. Equipment used by photographer to include:
- B. Digital Camera – Must have built-in gps location capabilities. Prepare color photographs digital file format as directed by the Construction Manager. The Contractor shall provide color printed copies upon the Construction Manager's request at no addition cost to the District. All electronic files become the property of the District. All electronic files are to be furnished in jpeg format and stored on a compact disc (CD) or another acceptable media device (thumb drive).

1.01 PRE-CONSTRUCTION PHOTOGRAPHS

- A. The Contractor shall provide a minimum one hundred (100) preconstruction photographs of the general project area sufficient to capture the general site prior to commencement of Work on the site. Preconstruction photographs shall be taken at locations to be coordinated with Construction Manager. These photographs shall be submitted prior to beginning construction.

1.02 DURING CONSTRUCTION PHOTOGRAPHS

- A. The Contractor shall provide construction color photographs showing the progress of the Work. Contractor is to take photos of all Work prior to being buried or covered including, but not limited, to piping, fittings, transitions, tie-ins and valves, vaults, concrete work, electrical conduits, etc. Contractor is to take photos of any significant planned or unplanned events. These vantage points will be coordinated with the Construction Manager and inspector. A minimum of forty-eight (48) photographs should be provided every month during construction. Photographs should be submitted with each month's Application for Payment.

1.03 POST-CONSTRUCTION PHOTOGRAPHS

- A. Upon acceptance of the Work, the Contractor shall provide a minimum of one hundred (100) photographs of the completed construction work and site restoration. Post-construction photographs shall be taken at locations to be coordinated with the Construction Manager. These photographs shall be submitted as part of Contract Closeout.

PART 2 – DELIVERABLE PRODUCTS

2.01 DIGITAL

- A. Electronic files – All digital images shall be compiled on CD or other approved electronic media (thumb drive) and provided with a descriptive index of the images. All CD's to be labeled in protected in an individual plastic case; other media device shall at a minimum have a read-me file cataloging the project name and content.

*****END OF SECTION*****

SECTION 01400

QUALITY CONTROL AND INSPECTION

PART 1 – CONTRACTOR’S QUALITY CONTROL

1.01 GENERAL

- A. The Contractor is to ensure that products, services, workmanship and Site conditions comply with the requirements of the Contract Documents by coordinating, supervising, testing and inspecting its Work. The Contractor shall utilize only suitably qualified, skilled and trained personnel experienced in the tasks required to complete the Work in accordance with the quality requirements of the Contract Documents. Should there be no quality basis specifically prescribed for any portion of the Work, the quality and testing procedures shall be in accordance with the best-accepted practices of the construction industry for the locale of the Project, for projects of this type, or standards set by engineering or technical societies (e.g. ASTM or ASHRAE), whichever is more stringent.

1.02 QUALITY OF WORK

- A. The Contractor’s quality of Work shall include, but not be limited to, the following requirements:
1. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects, and fit for the intended use.
 2. Quality of installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements, as shown on or required by Contract Documents.
 3. Protection of Completed Work: Take all measures necessary to preserve completed Work free from damage, deterioration, soiling, and staining, until acceptance by District.
 4. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report requirements in preparing, fabricating, erecting, installing, applying, connecting, and finishing Work.
 5. Deviations from Standards and Code Compliance and Manufacturer's instructions and Recommendations: Secure District's advanced written consent. Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgment

by the manufacturer that such deviations are acceptable and appropriate for the Project.

6. Verification of Quality: Work shall be subject to verification of quality by District in accordance with provisions of the Contract Documents.

1.03 DEFECTIVE WORK

- A. Defective Work shall be modified, replaced, repaired or redone by the Contractor at no change in Contract Sum or Contract Time. Acceptance of Defective Work, without specific written acknowledgement and approval of District, shall not relieve the Contractor of the obligation to correct such Work. Should District determine that it is not feasible or in District's interest to require Defective Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between District and Contractor. If equitable amount cannot be agreed upon, a Construction Change Directive will be issued and the amount in dispute resolved in accordance with the Contract Documents. District and District's consultants disclaim any and all responsibility for Work produced not in conformance with the Drawings and Specifications. Contractor shall have full responsibility for all consequences resulting from Defective Work, including without limitation all delays, disruptions, extra inspection and correction costs by Contractor and District and re-Work, and extra time and costs of all types. Contractor waives excuses for defective work relating to District's prior review of Submittals and/or prior failure to notice Defective Work in place on inspection.

PART 2 – INSPECTION AND TESTING

Additional requirements for tests are described in these Contract Documents.

2.01 GENERAL

- A. Where the Contract Documents require work to be field tested or approved, it shall be tested in the presence of the Construction Manager or its authorized representative. The Construction Manager shall have the right to witness all on-site tests performed by the Contractor and any shop tests. The results of any tests performed by the Contractor shall be made available for the information of the Construction Manager. Inspections, tests or favorable reviews by the Construction Manager or others shall not relieve the Contractor from its obligation to perform the work in accordance with the requirements of the Contract Documents or for its sole responsibility for the quality of workmanship and materials.
- B. Except as specifically required under the technical specifications for testing and inspection, all tests for materials furnished by the Contractor will be done in accordance with commonly recognized standards of national organizations. Where tests are to be performed by the Construction Manager or by an independent laboratory or agency, the Contractor shall furnish such samples

QUALITY CONTROL AND INSPECTION

of all materials as required by the Construction Manager without charge. The sample or samples of materials to be tested shall be selected by such laboratory or agency, or the Construction Manager, and not by the Contractor. No material for which the Contract Documents require the submittal and approval of tests, certificates of compliance or other documentation shall be incorporated in the Work until such submittal has been made and approved. The Contractor shall provide safe access, including plants where materials or equipment are manufactured or fabricated, for the Construction Manager and inspectors to adequately inspect the quality of work and the conformance with the Contract Documents. The Contractor shall furnish the Construction Manager the necessary labor and facilities for such things as excavation in the compacted fill to the depths required to take samples. The Contractor shall provide adequate lighting, ventilation, ladders and other protective facilities as may be necessary for the safe performance of inspections.

- C. Upon completion of the Work the Construction Manager will conduct a final inspection, all Records shall be available at all reasonable hours for inspection by other local or State agencies to ascertain compliance with laws and regulations.
- D. Neither the employment of independent testing and inspection agency nor observations or tests by District and District's consultants shall in any manner relieve the Contractor of obligation to perform Work in full conformance to all requirements of the Contract Documents. The District reserves the right to reject all Work not in conformance to the requirements of the Contract Documents, or otherwise Defective.

2.02 NOTICE

- A. The Contractor shall notify the Construction Manager in writing at least twenty-four (24) hours before any field testing or special inspections are required to be performed by the Construction Manager or independent laboratory furnished by the District. The Contractor shall notify the Construction Manager at least two hours before any inspection is required to be performed or to witness the Contractor's on-site field testing.
- B. Whenever the Contractor varies the period during which work is carried on each day, the Contractor shall give due notice to the Construction Manager so that proper inspection may be provided. Any work done in the absence of the Construction Manager shall be considered to be rejected. It will be the responsibility of the Contractor to demonstrate to the satisfaction the Construction Manager that the work meets all conditions of the specification and if such conditions are not met to remove the work.
- C. The Contractor shall give the Construction Manager written notification at least thirty (30) days prior to the shipment of materials and equipment to be tested and/or inspected at the point of origin. Satisfactory tests and inspections at the point of origin shall not be construed as a final acceptance of the materials and

equipment nor shall such tests and inspections preclude retesting or reinspection at the site of the Work.

2.03 COSTS OF TESTING

- A. The Contractor shall be responsible for, and shall pay for, all quality control and off-site tests of materials required including all source and mix design tests for the approval of soil aggregate and concrete materials. The District will perform the soils and concrete confirmation tests detailed in the Technical Specifications during the performance of the Work. District will retain and pay a qualified testing agency to perform soil compaction testing and asphalt compaction and work identified as requiring special inspections and testing as defined by UBC section 1701. All other testing required by the technical specifications shall be the responsibility of the Contractor.
- B. The Contractor shall be responsible for, and shall pay for, all source quality control and all on-site tests of materials required, except those tests specifically noted to be performed and paid for by the District.
- C. The Contractor shall be responsible for, and shall pay for, all water, sewer and drainage system testing and TV inspections as required.
- D. The Construction Manager shall have the authority to require additional tests or inspections due to the manner in which the Contractor executes its work. Examples of such additional tests and inspections include; tests of materials substituted for previously accepted materials, or substituted for specified materials, or retests made necessary by failure of material to comply with the requirements of the Specifications. Where such tests and inspections are required by Contract to be performed by the District, the District will pay for the additional tests and inspections but will issue a unilateral Change Order to deduct these costs from the Contract price.

2.04 WORK COVERED PRIOR TO INSPECTION AND/OR TESTING

- A. Work requiring inspection and/or testing shall not be concealed or buried prior to the acceptance of such inspection or testing. Work covered without the favorable review or consent of the Construction Manager shall, if required by the Construction Manager, be uncovered for inspection and/or testing at the Contractor's expense.

2.05 WORK COVERED WITH PRIOR INSPECTION AND/OR TESTING

- A. If the Construction Manager considers it necessary or advisable that covered work which was favorably inspected and tested be uncovered for reinspection and/or retesting, the Contractor, at the Construction Manager's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Construction Manager may require, that portion of the work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such work is defective, the Contractor will bear all expenses of

such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such work is not found to be defective the Contractor will be allowed an increase in the Contract price or an extension of the Contract time, or both, directly attributable to such uncovering, exposure, observation, testing and reconstruction, and a Change Order shall be issued for such additional work.

2.06 COORDINATION OF SASD, COUNTY, CITY BUILDING AND OTHER INSPECTIONS

- A. The Contractor is completely responsible for scheduling all SASD, County, City and any other agency inspections in accordance with the SASD, County, City and agency requirements. The Contractor shall notify the Construction Manager of all building and other work component inspection notices and schedules. Failure of the Contractor to properly coordinate and schedule these inspections shall not be cause for time extensions.

2.07 SPECIAL TESTS AND INSPECTIONS

- A. As provided for in the Contract Documents, laws and regulations, specialized tests and inspections shall be performed by special inspectors certified by the International Conference of Building Officials (ICBO). Unless otherwise stated in the Contract Documents, each of these tests will be performed and paid for by the District.

2.08 INSPECTIONS AND TESTS BY SERVING UTILITIES

- A. Unless otherwise indicated in the Contract Documents, the Contractor shall cause, schedule and conduct inspections and tests by serving Utilities required for the Work under this Contract.

2.09 INSPECTIONS AND TESTS BY SERVING MANUFACTURERS

- A. Unless otherwise indicated in the Contract Documents, the Contractor shall cause all required tests and inspections to be conducted by materials, equipment or systems manufacturers. Additionally, all tests and inspections required by materials, equipment or systems manufacturers as conditions of warranty or certification of Work shall be made, the cost of which shall be included in the Contractor's bid.

PART 3 – TEST WATER

- A. The District will furnish water for testing to the Contractor, free of charge, as is available from the District's water system. A District provided meter will be provided at the water source. The conveyance of water shall be the responsibility of the Contractor and shall be at the Contractor's expense.
- B. The Contractor shall submit a written request of water needs for testing including a description, volume, location and duration of use to the

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QUALITY CONTROL AND INSPECTION

Construction Manager for approval. The Construction Manager will designate the type of water, locations where connections may be made and the backflow protection, if required. The Contractor is responsible for providing, installing and testing the backflow prevention device at the Contractor's expense. The Construction Manager may also require a meter on the connection depending on the volume of water requested.

- C. There may be short periods of time when water is not available from the District's system.

*****END OF SECTION*****

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 – GENERAL

- A. This section covers the general requirements for the Contractor's temporary facilities at the job site and for the prosecution of the work. The Contractor shall be responsible for furnishing, installing and maintaining all temporary utilities required for the Work, all construction aids required for the Work, fences and barriers as required for protection of the public, property, environment and the Work, field offices and storage facilities, as specified, except as allowed herein, and removal of said items upon completion of the Work. The Contractor may use existing roadways and entrances for access and parking to the extent practical and allowable.

PART 2 – QUALITY ASSURANCE

- A. Contractor shall comply with applicable Federal, State, and local laws, codes, regulations and ordinances and with utility company requirements.

PART 3 – SUBMITTALS

- A. Submit the following information:
 - 1. Copies of permits and approvals for construction as required by Laws and Regulations of governing agencies.
 - 2. Backflow prevention procedures for temporary connection to District's potable water system, if applicable.
 - 3. Proposed plan and layout for all temporary offices, designated parking areas, sanitary facilities, storage yards, temporary water service and distribution, temporary sewer connection, temporary telephone service, temporary power service and distribution and temporary fire equipment.

PART 4 – TEMPORARY UTILITIES

4.01 UTILITY REQUIREMENTS

- A. The Contractor shall maintain and operate the temporary utility systems to assure continuous service. The systems shall be modified and extended as Work progress requires. Temporary materials and equipment shall be completely removed when their use is no longer required. The Contractor shall clean and repair any damage caused by temporary utility installations or use.

4.02 POWER

- A. Contractor shall make arrangements for temporary power, furnish temporary power pole and meter, make temporary connection, and make arrangements

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and pay all costs for a temporary power supply. Contractor shall arrange for and pay all costs associated with temporary power service to the field offices and to Contractor's storage sheds, and shall pay all costs for installation and removal of temporary service and all power used. Contractor shall pay for energy used during start-up and testing and until such time that the District takes beneficial occupancy of the Work or the Work is accepted by the District, whichever occurs first. The District shall arrange for and pay for all costs associated with relocation of existing utility power poles, transformers, wires and related facilities to provide and/or upgrade the permanent service to the facility.

- B. The Contractor shall provide temporary lighting to meet applicable requirements to allow erection or installation of materials and equipment and to allow observation and inspection of the Work.

4.03 WATER

- A. Contractor shall provide bottled drinking water service for all drinking water required by construction personnel. Provide refrigerated bottled water dispensers for all trailers to be occupied by personnel. Each dispenser shall have two 3-gallon internal reservoirs and an additional 5-gallon water bottle storage. A minimum of two extra 5-gallon water bottles shall be on hand at each trailer during the duration of occupancy. The Contractor shall be responsible for paying all costs associated with supplying drinking water.
- B. The Contractor shall provide water storage tankage as necessary for construction purposes.

4.04 TELEPHONE

- A. The Contractor shall provide telephone and internet service:
 - 1. Telephone lines and instruments for Contractors use at Contractor's option and costs.
 - 2. Internet service (wifi) and instruments for Contractors use at the Contractor's option and cost
- B. The Contractor shall pay all costs for installation and removal of telephone lines and instruments, local telephone service, and internet services. This includes all monthly service fees and cost. Telephone and internet service are to be installed and ready for use within 20 days after receipt of the Notice to Proceed.

4.05 HEATING AND VENTILATION

- A. The Contractor shall provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate the progress of the Work, to meet specified minimum conditions for the installation of materials,

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CONSTRUCTION FACILITIES AND
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and to protect materials and finishes from damage due to temperature or humidity. Adequate forced ventilation of enclosed areas shall be provided for curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors or gases. Portable heaters shall be standard approved units complete with controls and suitably vented to the outside as required for protection of health and property. The Contractor shall be responsible for paying all costs of installation, fuel, maintenance, operation, and removal.

PART 5 – CONSTRUCTION FACILITIES

5.01 GENERAL

- A. Temporary structures shall be structurally sound, weather tight, with floors raised above ground. Temperature transmission resistance shall be compatible with occupancy and storage requirements. At the Contractor's option, portable or mobile buildings modified for office use may be used. Existing site facilities and new permanent facilities shall not be used for construction facilities. Sites for temporary structures shall be filled and graded to provide surface drainage. Temporary structures shall be constructed on proper foundations, secured, provided with connections for utility services and provided with railed steps and landings at elevated entrance doors. Periodic maintenance and cleaning shall be provided for temporary structures, furnishings, equipment and services. Temporary structures, contents and services shall be removed when they are no longer needed for the Work. Foundations and debris shall be removed, the site graded to required elevations and the areas cleaned.
- B. Contractor shall not use any of the Districts facilities or supplies, including telephones, sanitary facilities, trash receptacles or vehicles.
- C. The Contractor shall, at all times, be responsible for the security of the Contractor's facilities, materials and equipment. The District will not be responsible for missing or damaged equipment, tools or personal belongings.

5.02 STORAGE BUILDINGS

- A. Storage buildings shall be adequate for the requirements of the various trades and shall have adequate dimensions for storage and handling of products. Ventilation shall be provided to comply with specified and code requirements for the products stored. Heating shall be provided to maintain temperatures specified in the respective sections for the products stored. Buildings shall be arranged and/or partitioned to provide security of contents and ready access for inspection and inventory. Combustible materials shall be stored in a well ventilated, remote building meeting applicable safety standards.

5.03 SANITARY FACILITIES

- A. The Contractor shall provide sanitary facilities for the on-site personnel:
 - 1. As required by laws and regulations.
 - 2. Not less than one (1) facility per site.
 - 3. Not less than one (1) facility for each 20 employees, or fraction thereof, of Contractor and subcontractors at the site.
- B. Facilities and enclosures shall be serviced, cleaned and maintained on a weekly basis. The District's existing sanitary facilities will not be available for use by Contractor or subcontractors.

PART 6 – CONSTRUCTION AIDS

- A. The Contractor shall provide construction aids and equipment required by personnel and to facilitate the execution of the Work including, but not limited to, scaffolds, staging, ladders, stairs, ramps, runways, platforms, railways, hoists, cranes, chutes and other such facilities and equipment as required. Contractor may, at his own risk, use hoists and cranes installed as part of the work, subject to the following:
 - 1. Coordinate with Engineer and District.
 - 2. Do not exceed rated capacity of hoists and cranes.
 - 3. Replace or repair any damaged units to the satisfaction of the District.
 - 4. District makes no representation as to the suitability, serviceability, or safety of hoists and cranes and assumes no responsibility for their safe use by the Contractor's personnel.
- B. Construction aids shall be relocated as required by the progress of construction, by storage or work requirements, and to accommodate legitimate requirements of District. Temporary materials and equipment shall be completely removed at the completion of the Project. Remove foundations and underground installations for construction aids. The areas of the site affected by temporary installations shall be graded to required elevations and slopes and the area clean. The Contractor shall clean and repair damage caused by installation or by use of temporary facilities

PART 7 – VEHICLE ACCESS AND PARKING

- A. Contractor shall ensure that construction vehicles do not limited access and street parking for area residents or businesses. All efforts shall be made to minimize the number of construction vehicles on site at all times.
- B. Parking in front of CHWD Headquarters with time limitation or designated for customer parking is strictly prohibited.

PART 8 – TEMPORARY BARRIERS AND ENCLOSURES

8.01 BARRICADES

- A. The Contractor shall provide suitable barricades as required for protection of the work and protection of the public, District's employees, Contractor's employees and others who may be affected by the Work. The barricades shall be provided to prevent unauthorized entry to construction areas and affected roads, streets and alleyways and to protect existing facilities and adjacent property from damage. Warning lights shall be illuminated on barricades where required for safety. Placement of barricades shall be done in a manner that will allow District's personnel access to existing facilities. The barricades shall be installed in a neat manner, with a reasonable uniform appearance and structurally adequate for the required purposes. Barricades shall be relocated as required by the progress of the Work. Barricades, including foundations, shall be removed when construction has progressed to the point that they are no longer needed. The Contractor shall repair damage caused by installation, fill and grade the areas of the site to required elevations and slopes and clean the area.

8.02 TEMPORARY FENCING AND SECURITY

- A. The Contractor shall provide all temporary fencing necessary to secure the project site and prevent unlawful entry of the District's site. The project site is located in a heavily trafficked area. The Contractor is responsible for the site security during the duration of the project. The Contractor shall be responsible for any damage or thefts on the District's property that occur due to site security issues.

PART 9 – TEMPORARY CONTROLS

- A. All BMPs identified in the approved SWPPP and any additional measures submitted by the Contractor shall be in place prior to the start of work.

*****END OF SECTION*****

Section 01500
CONSTRUCTION FACILITIES AND
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SECTION 01770

CLOSE OUT PROCEDURES

PART 1 – GENERAL

- A. Section Includes: Contract closeout requirements including:
 - 1. Preparation and submittal of closeout documents,
 - 2. Final completion certification.

PART 2 – WASTE DISPOSAL

- A. Arrange for and dispose of surplus materials, waste products, and debris off-site.
 - 1. Prior to making disposal on private property, obtain written permission from District of such property.
- B. Do not fill ditches, washes, or drainage ways which may create drainage problems.
- C. Do not create unsightly or unsanitary nuisances during disposal operations.
- D. Maintain disposal site in safe condition and good appearance.
- E. Complete leveling and cleanup prior to final acceptance of the Work.

PART 3 – TOUCH-UP AND REPAIR

- A. Touch-up or repair finished surfaces on structures, equipment, fixtures, and installations that have been damaged prior to inspection for Final Acceptance.
- B. Refinish or replace entire surfaces which cannot be touched-up or repaired satisfactorily.

PART 4 – CLOSEOUT DOCUMENTS

- A. Submit following Closeout Submittals upon Completion and at least seven (7) days prior to submitting Application for Final Payment:
 - 1. Evidence of Compliance with Requirements of Governing Authorities.
 - 2. Project Record Documents.
 - 3. Operation and Maintenance Manuals.
 - 4. Warranties and Bonds.
 - 5. Evidence of Payment and Release of Liens and Stop Payment Notices as outlined in Conditions of the Contract.
 - 6. Release of claims as outlined in Conditions of the Contract.
 - 7. Certificate of Final Completion.

8. City Building Permit completion/ final acceptance.

PART 5 – PROJECT RECORD DOCUMENTS

- A. Maintain at Project site, available to District and Construction Manager, one (1) copy of the Contract Documents, shop drawings and other submittals, in good order.
 1. Mark and record field changes and detailed information contained in submittals and change orders.
 2. Record actual depths, horizontal and vertical location of underground pipes, duct banks and other buried utilities. Reference dimensions to permanent surface features.
 3. Identify specific details of pipe connections, location of existing buried features located during excavation, and the final locations of piping, equipment, electrical conduits, manholes, and pull boxes.
 4. Identify location of spare conduits including beginning, ending and routing through pull boxes, and manholes. Record spare conductors, including number and size, within spare conduits, and filled conduits.
 5. Provide schedules, lists, layout drawings, and wiring diagrams.
 6. Make annotations with erasable colored pencil conforming to the following color code:

Additions:	Red
Deletions:	Green
Comments	Blue
Dimensions:	Graphite

- B. Maintain documents separate from those used for construction. 1. Label documents "RECORD DOCUMENTS."
- C. Keep documents current.
 1. Record required information at the time the material and equipment is installed and before permanently concealing.
- D. Deliver record documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.
- E. Record documents shall be available for the Construction Manager to review to ascertain that changes have been recorded.
- F. Failure of the Contractor to keep current with the updating of the Record Documents shall be grounds for withholding monies from partial payment estimates.

****END OF SECTION****

SECTION 02000
ENVIRONMENTAL CONDITIONS – SEISMIC, WEATHER AND ELEVATION

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes:
1. Seismic Conditions
 2. Weather Conditions
 3. Elevation

1.02 SEISMIC CONDITIONS

- A. Approximate Coordinates: N 38.679° W 121.289°
- B. I = 1.0
- C. Assume Site Class D
- D. $F_a = 1.384$
- E. $F_v = 1.891$
- F. $SD_s = 0.480$
- G. $SD_1 = 0.321$

1.03 WEATHER CONDITIONS

- A. Freezing conditions may exist during the winter months.
- B. 100 degree plus temperatures may exist during the summer months.

1.04 ELEVATION

- A. Elevation at the site is approximately 160 feet.

END OF SECTION

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SECTION 02072

DEMOLITION, ABANDONMENT, CUTTING AND PATCHING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Section Includes:

1. Demolition, cutting and patching and/or abandonment of existing pipeline or construction where shown on Drawings, or as required to accommodate new work shown or specified.

1.02 QUALITY ASSURANCE

- A. Work shall be performed in accordance with local, State, and Federal requirements, and in compliance with the jurisdictional Agency's requirements and permits.
- B. Abandonment and/or removal of the existing sewer pipeline and manhole shall meet SASD standards and all applicable regulations.

1.03 SUBMITTALS

A. Shop Drawings:

1. See Section 01330.
2. Indicating manufacturer and type of proposed materials and methods to be used for matching and repairing existing construction.

- B. Abandonment Plan – Contractor shall submit a plan for abandonment and/or removal of the existing sewer pipeline and manhole. The plan shall be submitted and approved by the District in advance of the work.

1.04 DELIVERY, STORAGE, AND HANDLING

A. General:

3. Salvage items, designated for salvage, as a functional unit.
4. Clean, list and tag for storage.
5. Protect from damage and deliver to location designated.
6. Salvage each item with auxiliary or associated equipment required for operation.

1.05 PROJECT CONDITIONS

- A. Perform preliminary investigations as required to ascertain extent of work.

1.06 SEQUENCING AND SCHEDULING

- A. Coordinate and reschedule work as required to preclude interference with other operations.

1.07 SEWER ABANDONMENT/REMOVAL

- A. As noted on the plans portions of the existing sewer system may interfere

with the Work. The Contractor shall determine which portions of the sewer system require removal and disposal and which sections may be abandoned in place (either by crushing the pipe or filling with slurry). Prior to the work the Contractor shall submit a plan for approval as noted above.

- B. The Contractor is responsible to ensure that the final removal and/or abandonment methods selected do not cause any settlement or future issues with the proposed work.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Not used.

2.02 MATERIALS

- A. Not used

PART 3 – EXECUTION

3.01 PREPARATION

- A. Provide temporary partitions as required in public areas.
 - 1. Construct partitions of braced plywood in exterior areas.
 - 2. Adequately braced paneling may be used in interior areas.
- B. Provide bridged passageways with hand rails where necessary to ensure safe passage of persons in or near areas of work.
- C. Provide substantial barricades and safety lights as required.
 - 1. Work in and around all road shall be in compliance with the Contractor's approved traffic control plan and the encroachment permit.
- D. Provide temporary dustproof partitions where indicated or necessary.
 - 1. Prevent infiltration of dust into occupied areas.
- E. Provide temporary weather protection as necessary.

3.02 INSTALLATION

- A. Cutting and Removal:
 - 1. Remove existing work indicated to be removed, or as necessary for installation of new work.
 - 2. Neatly cut and remove materials, and prepare all openings to receive new work.
 - 3. Remove masonry or concrete in small sections.
- B. Modification of Existing Concrete:
 - 1. Where indicated or required to necessitate work, remove existing concrete and finish remaining surfaces.
 - a. Protect remaining concrete from damage.
 - b. Make openings by sawing through the existing concrete.

- c. Concrete may be broken out after initial saw cuts in the event concrete thickness prevents cutting through.
 - d. Where sawing is not possible, make openings by drilling holes around perimeter of opening and then chipping out the concrete.
 - 1) Holes shall be sufficient in number to prevent damage to remaining concrete.
 - 1. Oversize required openings in existing concrete 1 IN on all sides and build back to required opening size by means of non-shrink grout epoxy bonded to the existing concrete.
 - 2. Where oversized openings cannot be made, remove the concrete to the required opening size and cut back exposed reinforcing 1 IN from face of concrete and fill resulting holes with non-shrink grout.
- C. Matching and Patching:
- 1. Walls, ceilings, floors or partitions:
 - a. Repair abutting walls, ceilings, floors or partitions disturbed by removal.
 - b. Match and patch existing construction disturbed during installation of new work.
 - 2. Methods and materials:
 - a. Similar in appearance, and equal in quality to adjacent areas for areas or surfaces being repaired.
 - b. Subject to review of Engineer.
- D. Salvaged Items:
- 1. Thoroughly dry and clean all metal surfaces.
 - 2. Prime all bare metal in accordance with Section 09900.
 - 3. Dispose of items or materials not designated for salvage or reuse. Promptly remove from site.
 - 4. Do not store or sell Contractor salvaged items or materials on site.
- E. Clean Up:
- 1. Transport debris and legally dispose of offsite.

END OF SECTION

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SECTION 02200

EARTHWORK

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Clearing, grubbing, and site preparation.
2. Removal and disposal of debris.
3. Handling, storage, transportation and disposal of excavated material.
4. Sheeting, shoring, bracing and protection work.
5. Trench dewatering as required for all construction.
6. Excavation and trenching.
7. Backfilling.
8. Pipe embedment.
9. Construction of fills and embankments.
10. Surfacing and grading.

B. Related sections:

1. Additional requirements specified elsewhere:
 - a. Contractor Submittals: Section 01330
 - b. Quality Control: Section 01400
2. Related Work specified elsewhere:
 - c. Cast-in-Place Concrete: Section 03301
 - d. Pipe and Pipe Fittings: Section 15060
 - e. Ductile Iron Piping: Section 15062

1.02 REFERENCES

A. American Society of Testing and Materials (ASTM)

1. C33 Standard Specification for Concrete Aggregates
2. D422 Method for Particle-Size Analysis of Soils.
3. D1557 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in (457-mm) Drop.
4. D2419 Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
5. D2487 Classification of Soils for Engineering Purposes.
6. D2922 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
7. D3017 Test Method for Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)
8. D4253 Test Methods for Maximum Index Density of Soils Using a Vibratory Table.
9. D4254 Test Methods for Minimum Index Density of Soils and Calculation

of Relative Density.

10. D4318 Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

11. D6938 Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

B. Geotechnical Report

1. A geotechnical investigation was conducted within the project site. A copy may be found in the Appendices to these specifications.
2. All excavations and over-excavations shall follow the recommendations for extents, depths, and compaction in the Geotechnical Report unless more stringent conditions are specified elsewhere.

1.03 DEFINITION

- A. Pipe Zone Backfill: The pipe zone is defined as that portion of the vertical trench cross-section lying between a plane 6" below the bottom surface of the pipe, i.e., the trench subgrade, and a plane 12" above the top surface of the pipe.
- B. Pipe Bedding: The bedding for flexible pipe is defined as that portion of the pipe zone backfill material between the trench subgrade and the bottom of the pipe.
- C. Trench Zone Backfill: The trench zone backfill is defined as that portion of the vertical trench cross-section lying between a plane 12" above the top surface of the pipe and a plane at a point 12" below the finished surface grade, or if the trench is under pavement, 9" below the roadway subgrade.
- D. Road Zone: Final backfill is all backfill in the trench cross-sectional area within 12" of finished grade, or if the trench is under pavement, all backfill within 12" of the roadway subgrade

1.04 SUBMITTALS

- A. General: Submit the following items in accordance with Section 01330 SUBMITTALS.
- B. The Contractor's attention is directed to the provisions for "Shoring and Bracing Drawings" in Section 6705 of the California Labor Code. The Contractor shall submit a detailed plan and obtain the Owner's written acceptance prior to beginning any excavation 5 feet deep or deeper. This plan shall include the design of all shoring, bracing, sloping of the sides of excavation, or other provisions for worker protection against the hazard of caving ground during the excavation. If such plan varies from the shoring system standards established in the Construction Safety Orders of the State of California, such alternative systems plans shall be prepared by a civil or structural engineer licensed in the State of California.
- C. The Contractor retains all liability for Shoring and Bracing and their means and methods of construction regardless of acceptance of the plans by the

Owner or their representative.

- D. The Contractor shall submit samples of materials in accordance with the Contract Documents.
 - 1. Material samples:
 - a. Coarse base rock.
 - b. Drain gravel.
 - c. Road base.
 - d. Sand
 - e. Engineered fill.
 - f. Native backfill.
 - 2. Gradation curves:
 - a. Coarse base rock.
 - b. Drain gravel.
 - c. Road base.
- E. Trench Dewatering:
 - 1. Proposed equipment.
 - 2. Well or sump location, size, and details of construction.
 - 3. Size and layout of discharge headers.
 - 4. Copy of the approved discharge permit.
- F. Contractor shall submit a copy of the approved excavation permit issued by the California Department of Industrial Safety
- G. Potholing Report
 - 1. Contractor shall pothole all known utility conflicts and all tie-in locations.
 - 2. Contractor shall provide all pothole information to the Engineer for review prior to ordering pipe and fitting materials.

1.05 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Safety Regulations: Work shall comply with all Federal, state and municipal regulations regarding safety, including the requirements of the following:
 - a. Williams - Steiger Occupational Safety & Health Act of 1970
 - 2. Local Requirements: All work falling under the local jurisdiction shall conform to their applicable requirements.
 - 3. All trenching work shall conform to Trench Construction Safety Orders of California State Industrial Accident Commission (CSIAC)
- B. General: All soils testing will be done by a testing laboratory of the Owner's choice at the Owner's expense except as specified below. Contractor shall give owner a minimum of 48-hour notice of any testing is needed.
- C. Where soil material is required to be compacted to a percentage of maximum density, the maximum density at optimum moisture content will be determined in accordance with ASTM D 1557. Where cohesionless, free draining soil

material is required to be compacted to a percentage of relative density, the calculation of relative density will be determined in accordance with ASTM D 4253 and D 4254. Field density in-place tests will be performed in accordance with ASTM D 2922. No correlating sand cone tests (ASTM D 1556) are planned.

- D. In case the tests of the fill or backfill show non-compliance with the required density, the Contractor shall accomplish such remedy as may be required to insure compliance. Subsequent testing to show compliance shall be by a testing laboratory selected by the Owner and shall be at the Contractor's expense.
- E. Tests will be made by the Owner in accordance with the following methods:

Test	Standard Procedure
Moisture content	ASTM D3017
Gradation	ASTM D422
Density in-place	ASTM D6938
Moisture-density relationships	ASTM D1557
Plasticity Index	ASTM D4318

- F. Unified Soil Classification System: The Contractor shall be bound by all applicable provisions of ASTM D 2487 in the interpretation of soil classifications.
- G. Contractor must notify Owner at least 24 hours in advance of backfill compaction activities.
- H. Fills and embankment:
 1. Owner will arrange and pay for relative compaction test based on the ASTM D1557-91 test method, on each type of fill material.
 2. Minimum testing of in-place compaction test for each lift of material placed.
- I. Pipe embedment and backfill:
 1. Contractor shall provide initial gradation tests for each type of imported material.
 2. Engineer shall provide relative compaction tests, (ASTM D1557-91), for each type of embedment or backfill material proposed. Contractor shall provide sufficient size sample for testing.
 3. One (1) in-place density test for each 50 feet of trench, per lift.

1.06 PROJECT/SITE CONDITIONS

- A. Environmental requirements: Refer to Section 02000

B. Protection:

1. Protect adjacent structures and surrounding facilities from damage during excavation, filling and backfilling.
2. Protect any existing vegetation, landscape, or hardscape features not identified as being removed.
3. Protect work from erosion or other similar types of damage until the project has been completed.
4. Provide temporary bridges for roadways, walkways, driveways, etc.

C. Weather:

5. Material excavated during inclement weather shall not be used as fill or backfill until after the material drains and dries sufficiently or has been blended with other suitable materials to achieve proper moisture content that allows for proper compaction.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Backfill materials shall be suitable selected or processed clean, fine earth, rock, or sand, free from grass, roots, brush, or other vegetation.
- B. Fill and backfill materials to be placed within 6 inches of any structure or pipe shall be free of rocks or unbroken masses of earth materials having a maximum dimension larger than 3 inches.
- C. Classification of excavated materials:
 1. None.
 2. Remove and handle excavated materials regardless of its type, character, composition, condition, or depth.

2.02 MATERIALS

- A. Suitable materials may be obtained from on-site excavations and may be processed on-site, or may be imported. If imported materials are required to meet the requirements of this Section or to meet the quantity requirements of the project, the Contractor shall provide the imported materials at no additional expense to the Owner, unless a unit price item is included for imported materials in the bidding schedule.
- B. Coarse base rock: Provided as shown on Drawings
- C. Road base:
 1. In accordance with the Caltrans specification 26-1.02 for Class II aggregate base.
 2. Sieve Size % Passing Sieve
 1" 100
 3/4" 90-100

#4	35-60
#30	10-30
#200	2-9

3. Compact to at least 95 percent of the relative compaction based on the ASTM D1557-91 test method.
4. The sand equivalent shall not be less than 30.
5. The durability index shall not be less than 35.
6. Minimum 6 inches thick and thicker where specifically shown on Drawings.
7. Alternate to use as pipe embedment.
8. Under road construction.
9. Under slabs on grade.

D. Pipe Zone:

1. Steel or ductile iron pipe: Sand. Native material may be used with District approval
2. Compact to at least 90 percent of the relative compaction based on the ASTM D1557-91 test method.
3. Backfill both sides of pipe installation simultaneously
4. PVC Pipe: Sand.
 - a. Sieve size % Passing Sieve
 - #4 90-100
 - #200 0-5

E. Trench Zone Backfill:

1. Shall be in accordance with District Standard Details and the Drawings.
2. Provide all on-site or off-site borrow materials as necessary to complete the project.
3. Backfill material mix shall be submitted for District approval
4. Material shall be free from brush, stumps, logs, roots, debris, and other deleterious material.
5. Compact to at least 95 percent of the relative compaction based on the ASTM D1557-91 test method.

F. Backfill around structures:

1. Engineered Fill: For all backfill around structures, trench zone backfill beneath pavement and under structures.
2. Provide all on-site or off-site borrow materials as necessary to complete the project.
3. Material shall be free from brush, stumps, logs, roots, debris, and other deleterious material.
4. Well graded, maximum rock 3-inch; sand and gravel mix with a maximum of 25 percent passing the No. 200 sieve. Process as necessary to meet gradation requirements.
5. Compact to at least 95 percent of the relative compaction based on the ASTM D1557-91 test method.
6. Compact to at least 98 percent of the relative compaction based on the ASTM D1557-91 test method in select areas specifically noted on plans.

G. General backfill

1. Only for areas specifically labeled general backfill.
2. Native material.
3. Free from brush, stumps, logs, roots, debris, and other deleterious material.
4. Well graded, maximum rock 6-inch. Process as necessary to meet gradation requirements.
5. Compact to at least 90 percent of the relative compaction based on the ASTM D1557-91 test method.

H. Topsoil:

1. Native material removed and stockpiled before excavation.
2. Free from trash, roots and brush, and general debris.
3. Compacted to 85% relative compaction.

I. Geotextile filter fabric:

1. Mirafi 180N.
2. Supac 8NP.
3. Or equal.

PART 3 – EXECUTION

3.01 GENERAL

- A. Site Access: Access to the site will utilize public and private roads. Exercise care in the use of such roads and repair at own expense any damage thereto caused by Contractors operations. Such repairs shall be to the satisfaction of the owner or agency having jurisdiction over the road. Take whatever means necessary to prevent tracking of mud onto existing roads and keep roads free of construction debris.
- B. Field verify the location of all underground utilities, pipelines, and structures.
1. Underground Services Alert (USA): Contractor shall contact Underground Services Alert at 1-800-642-2444 and have underground utilities located at least 2 days prior to the start of excavation.
 2. All affected Agencies shall be given 48-hour notice prior to the start of construction affecting their parcel and/or utility.
- C. Demolition and Clearing
1. Clear site to be occupied by permanent construction of logs, trees, stumps, roots, brush, tree trimmings, and other objectionable material and debris
 2. Remove soft soil materials, loose materials, wood, debris and deleterious substances encountered within excavated areas.
 3. Clean subgrades of loose material before concrete is placed thereon.
 4. Clean and strip subgrade for fills and embankments of surface vegetation, sod, and organic topsoil to the depth specified in the specifications or call

out on the plans.

5. Remove waste materials from site and dispose of daily. Burning on-site will not be allowed.
6. Preservation of trees.
 - a. Do not remove trees outside fill or excavated areas, except as authorized by Engineer.
 - b. Protect trees left standing from permanent damage by construction operation.
7. Dust Control: Take all proper and efficient steps to control dust as described in Section 01560.

D. Site Safety

1. Perform work in a safe and proper manner with appropriate precautions against hazards.
2. Barriers: Barriers shall be placed as may be necessary to warn all pedestrian and vehicular traffic of such construction activity and excavations.
3. Trenches and excavations shall be backfilled or sufficiently plated and secured until finished grading and pavement are complete.
4. Provide adequate working space and clearances for work performed within excavations and for installation and removal of concrete forms.
5. Do not undercut excavation faces for extended footings.
6. Traffic Regulations: Provide such flagmen, lighted barricades, lights, warning signs, and safety devised as may be required for control of traffic adjacent to all areas of work.

3.02 INSTALLATION

A. Support of Excavations:

1. Adequately support excavation for trenches and structures to meet all requirements in the current rules, orders, and regulations prescribed in the Construction Safety Orders of the Department of Industrial Relations, Division of Industrial Safety, State of California. Excavation shall be adequately shored, braced, and sheeted as necessary so that the earth will not slide or settle and so that all existing structures and all new pipe and structures will be fully protected from damage.
2. Take all necessary measures to protect excavations and adjacent improvements from running, caving, boiling, settling, or sliding soil resulting from potential water and the nature of the soil excavated. Attention is directed to Section 832 of the Civil Code of the State of California relating to lateral and subjacent supports, and wherever structures or improvements adjacent to the excavation may be damaged by such excavation, the Contractor shall comply with this law.
3. Design and build sheeting, shoring and bracing to withstand all loads that might be caused by earth movement or pressure and to be rigid, maintaining shape and position under all circumstances.
4. The support for excavation shall remain in place until the pipeline or

structure has been completed. During the backfilling of the pipeline or structure, the shoring, sheeting, and bracing shall be carefully removed so that there shall be no voids created and no caving, lateral movement or flowing of the sub-soils.

B. Dewatering:

1. Provide and maintain adequate dewatering equipment to remove and dispose of surface and groundwater entering excavations, trenches, existing sump pit, and other parts of the work. Existing pipe and bedding will act as a conduit into excavations. Contractor shall be responsible to control and dewater all water in excavations.
2. Keep each excavation dry during subgrade preparation and continually thereafter until the structure to be built or the pipe to be installed is completed to the extent that no damage from hydrostatic pressure, flotation, or other cause will result.
3. Dewater excavations which extend to or below groundwater by lowering and keeping the groundwater level beneath such excavation at least 24 inches below the bottom of the excavation.
4. Divert surface water or otherwise prevent it from entering excavated areas or trenches to the extent practical without damaging adjacent property.
5. Contractor is responsible for the condition of any pipe or conduit he uses for drainage. All drainage pipes shall be left clean and free of sediment.
6. Provide and pay for all power, services, manpower, etc., to maintain a completely dry construction site.
7. Obtain all required local, State and Federal permits required to discharge water pumped from the excavations.

3.03 SITE PREPARATION FOR STRUCTURAL FILLS

- A. All topsoil, soils with significant organics, and organic materials including vegetation shall be removed from the area receiving structural fill.
- B. All foundation soil which will receive structural fill shall be densified to 8-inches minimum depth, to at least 90 percent relative compaction in accordance with ASTM D1557. Immediately before this densification, soils shall have optimum moisture content, within plus or minus 2 percent.
- C. Scarification and moisture conditioning of foundation soils may be required.
- D. If native foundation soils are too coarse to allow density testing (i.e., greater than 30% by weight is retained on a $\frac{3}{4}$ " sieve), then foundation soil shall be proof-rolled:
 1. For mass grading, at least 5 passes with a minimum 10-ton roller.
 2. For trenches, at least 5 passes with a hand compactor.
- E. Where boulders are encountered protruding from an excavation, they shall be removed, and the depression shall be backfilled and compacted with structural fill to meet the moisture-density requirements listed above
- F. Where the undisturbed condition of natural soils is inadequate for support of

the planned construction, the Engineer will direct the Contractor to over excavate to adequate supporting soils. The excavated space shall be filled to the specified elevation with Engineered (Structural) fill in accordance with Table A - Fill Placement. The over excavated space under footings may be filled with concrete. The quantity and placement of such material will be compensated as extra work.

3.04 FILL PLACEMENT

- A. Backfill shall not be dropped directly upon any structure or pipe so as to cause damage. Backfill shall not be placed around or upon any structure until the concrete has attained sufficient strength to withstand the loads imposed.
- B. Except for drain rock materials being placed in over-excavated areas or trenches, backfill shall be placed after all water is removed from the excavation.
- C. Fill material shall be placed in even horizontal layers and thoroughly mixed as necessary to promote uniformity of material in each layer. Pipe zone backfill materials shall be manually spread around the pipe so that when compacted the pipe zone backfill will provide uniform bearing and side support.
- D. Where the backfill material moisture content is below the optimum moisture content water shall be added before or during spreading until the proper moisture content is achieved.
- E. Where the backfill material moisture content is too high to permit the specified degree of compaction the material shall be dried until the moisture content is satisfactory.
- F. Material type, maximum layer depth, relative compaction, and general application are specified in Table A.
- G. Fill material shall be compacted with power-operated tampers, rollers, idlers, or vibratory equipment, as appropriate for the soil type and application.
 - 1. Open-graded gravel/drain rock materials shall be compacted by means of at least two passes from a flat plate vibratory compactor.
 - 2. Additionally, pipe zone backfill materials that are granular may be compacted by mechanical means. Jetting and ponding is not allowed.
 - 3. Equipment that is consistently capable of achieving the required degree of compaction shall be used and each layer shall be compacted over its entire area while the material is at the required moisture content.
 - 4. Equipment weighing more than 10,000 pounds shall not be used closer to walls than a horizontal distance equal to depth of the fill at that time.
 - 5. Hand operated power compaction equipment shall be used where use of heavier equipment is impractical or restricted due to weight limitations.
- H. Unless otherwise specified, fill placement classes shall be used where specified in Table A under general application, in accordance with ASTM D1557.

Table A, Fill Placement

Fill Type	Maximum uncompressed layer thickness, inches	Minimum relative compaction, percent	Moisture content, percent	General application
Sand	12	95	± 2 of optimum	Pipe Zone
Road (Aggregate) Base	8	95	± 2 of optimum	Roadway, Slab Floor Base
Engineered Fill (Structural)	8	95	± 2 of optimum	Structural Fill for Foundations, Trench Zone Backfill Beneath Pavement And Under Structures
Engineered Fill (Non-Structural)	12	90	± 2 of optimum	Trench Zone Backfill in Unpaved Areas. Site Fill and Nonstructural Fill Outside Perimeter of Structure or Other Nonstructural Areas
Open-Graded Gravel / Drain Rock	12	NA	NA	Infiltration Trenches, Surface Stabilization

3.05 PIPELINE AND UTILITY TRENCHES

A. General:

1. The Contractor shall do all excavating of whatever substance encountered to a depth as indicated on the approved plans or as specified herein. Excavated materials not required or unsuitable for backfill shall be removed from the site and legally disposed of by the Contractor at their expense. Pipe trenches shall be sufficiently straight between the designated angle points to permit the pipe to be laid true to line in the approximate center of the trench.
2. Unless otherwise shown or ordered, excavation for pipelines and utilities shall be open-cut trenches. Trench widths shall be kept as narrow as is practical for the method of pipe zone densification selected by the Contractor, but shall have a minimum width at the bottom of the trench as shown in the typical details. Where sheeting and shoring are used, the maximum allowable width shall be measured between the closest interior faces of the sheeting or shoring as placed. Overall width of the excavation

equipment used shall in no case exceed the maximum allowable trench width. Whenever, for any reason, the maximum allowable trench width is exceeded at the top of the pipe, the Contractor shall employ one or more of the following procedures as approved by the District:

- a. The pipe shall be bedded in a monolithic cradle of plain or reinforced concrete having a minimum thickness of one fourth (1/4) the inside pipe diameter or a minimum of four inches (4") under the barrel and extending up the sides for a height equal to one-half (1/2) the outside diameter. The cradle shall have a width at least equal to the outside diameter of the pipe barrel plus eight inches (8"). Backfill above the crown of the pipe shall be compacted carefully.
 - b. Provide a higher strength pipe required to withstand the increased loading on the pipe caused by the excessive trench width.
 - c. Install temporary sheeting and shoring while the pipe is being installed with the backfill placed and compacted to a height at least one (1) foot above the top of the pipe.
3. The Contractor may stock pile excavated material adjacent to the trench. Excavated materials not used in the backfill operations shall be hauled off daily and legally disposed of at the Contractor's expense.
- B. Trench Bottom: Except when pipe bedding is required, the bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe. The trench bottom shall be given a final trim, using a string line for establishing grade, such that each pipe section when first laid will be continually in contact with the ground along the extreme bottom of the pipe. For bell and spigot pipe, the Contractor shall round out a cradle for the bell so that the bottom of the pipe is in continual contact with the bedding.
- C. Open Trench: The maximum amount of open trench permitted in any one location shall be the length necessary to accommodate the amount of pipe installed in a single day. All trenches shall be fully backfilled at the end of each day or shall be covered by heavy steel plates or plywood adequately braced and capable of supporting heavy vehicular traffic.
- D. Trench Over-Excavation: Where the Drawings indicate that trenches shall be over-excavated, they shall be excavated to the depth shown, and then backfilled to the grade of the bottom of the pipe.
- E. Over-Excavation: When ordered by the Engineer, whether indicated on the Drawings or not, trenches shall be over-excavated beyond the depth shown. Such over-excavation shall be to the depth ordered. The trench shall then be backfilled to the grade of the bottom of the pipe. All work specified in this Section shall be performed by the Contractor when the over-excavation ordered by the Engineer is less than 6" below the limits shown. When the over-excavation ordered by the Engineer is 6" or greater below the limits shown, additional payment will be made to the Contractor for that portion of the work which is located below said 6" distance. Said additional payment will be made under separate unit price bid items for over-excavation and bedding if such bid items have been established; otherwise payment will be made in

accordance with a negotiated price.

F. Completion of Excavation: The Contractor shall notify the District when excavations for pipelines or utilities are completed, and no concrete shall be deposited, nor pipes installed, until the excavations have been approved by the District.

G. OVER-EXCAVATION NOT ORDERED, SPECIFIED, OR SHOWN

1. Any over-excavation carried below the grade ordered, specified, or shown, shall be backfilled to the required grade with the specified material and compaction. Such Work shall be performed by the Contractor at his/her own expense.

H. TRENCH BACKFILL AND COMPACTION

1. Bedding shall be provided for all pipelines.
2. After compacting the bedding, the Contractor shall perform a final trim using a string line for establishing grade, such that each pipe section when first laid will be continually in contact with the bedding along the extreme bottom of the pipe.
3. The pipe zone shall be backfilled with the specified backfill material. The Contractor shall exercise care to prevent damage to the pipe itself during the installation and backfill operations.
4. After the pipe zone backfill has been placed as specified above, backfilling of the trench zone may proceed.

3.06 DISPOSAL OF EXCESS EXCAVATED MATERIAL

- A. The Contractor shall remove and dispose of all excess excavated material at a site selected by the Contractor.
- B. Unless otherwise specified, surplus excavated material shall be disposed of off-site in accordance with applicable ordinances and environmental requirements, and in a legal manner.
- C. If the quantity of surplus material is specified, the quantity specified is approximate. The Contractor shall satisfy himself that there is sufficient material available for the completion of the trench backfill before disposing of any material inside or outside the site. Shortage of material, caused by premature disposal of any material by the Contractor, shall be replaced by the Contractor at their expense.
- D. Material shall not be stockpiled to a depth greater than 5 feet above finished grade within 25 feet of any excavation or structure except for those areas designated to be pre-consolidated. For these areas, the depth of stockpiled material shall be as specified. The Contractor shall maintain stability of the soil adjacent to any excavation.

3.07 INSTALLATION

A. General:

1. Perform work in a safe and proper manner with appropriate precautions against hazard.
 2. Provide adequate working space and clearances for work performed within excavations and for installation and removal of concrete forms.
 3. Do not undercut excavation faces for extended footings.
 4. Remove soft soil materials, loose materials, wood, debris and deleterious substances encountered within excavated areas.
 5. Clean subgrades of loose material before concrete is placed thereon.
 6. Do not over excavate without written authorization of the Engineer.
 7. Except as otherwise authorized, indicated, or specified, replace all material excavated below the bottom of concrete walls, footings, slabs on grade and foundations with concrete placed at the same time and monolithic with concrete above.
 8. Over excavate under new structure a minimum of one foot to firm native material, or as specified. Extend over excavations to 3 feet laterally beyond structure limits, or as specified.
 9. Any soils not specified in Table A or on the drawings shall be compacted to a minimum of 90% relative compaction.
- B. Final grading:
1. After completion of all other outside work and after backfilling and embankments are completed and settled, bring to grade at the indicated elevations, slopes, and contours all areas of the site to be graded.
 2. Graders and other power equipment may be used for final grading and slope dressing if the result is uniform and equivalent to hand work.
 3. Grade all surfaces for effective drainage.
 4. Provide a 2 percent minimum slope except as otherwise required.
 5. Grade and surface to the District Representative's satisfaction.
- C. Settlement:
1. Guarantee against settlement for all fills, embankments, and backfills is one (1) year from final completion of Contract.
 2. Repair or replace within 30 days after notice by Engineer or Owner.

END OF SECTION

SECTION 02575

PAVING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work in this section includes the installation of new pavement and reconstruction of existing pavement as identified on the plans. New pavement shall comply with the requirements of this specification or as shown on the plans. The reconstruction of existing pavement shall match the original materials and dimensions subject to the minimum requirements of the Contract Documents. All work shall match the appearance of the existing improvements. Work covered in this section shall be completed in accordance with District requirements and these Specifications.

1.02 REFERENCE DOCUMENTS

A. Reference Specifications: Whenever the words "Standard Specifications" are referred to in this Specification (02575), the reference is to the State of California, Department of Transportation (CALTRANS), Standard Specifications current edition. Standard Specifications paragraphs concerning measurement and payment are excluded.

1.03 SUBMITTALS

- A. General: Submit the following items in accordance with Section 01330 SUBMITTALS.
- B. Certification: Certification from the material supplier that the materials supplied for this project meet the Specifications.

PART 2 – PRODUCTS

2.01 CONCRETE

A. Concrete shall meet the requirements of Section 03301 CAST-IN-PLACE CONCRETE.

2.02 HOT MIX ASPHALT (HMA) PAVEMENT

- A. Hot Mix Asphalt Pavement is not considered minor hot mix asphalt and shall meet the requirements of Section 39 of the Standard Specifications and the City of Citrus Heights pavement requirements.
1. Asphalt binder used in HMA Type A must be PG 64-16.
 2. Aggregate used in HMA Type A must comply with the ½-inch HMA Types A and B gradation.

2.03 TRAFFIC STRIPES AND PAVEMENT MARKINGS

A. Traffic stripes and pavement markings, except fire lane markings, shall be thermoplastic per Standard Specifications Section 84. Traffic striping and

pavement markings shall be placed as shown on the plans or to match existing.

- B. Fire lane markings shall be red paint stripes with white paint lettering per Sacramento Metropolitan Fire District Standards.

PART 3 – EXECUTION

3.01 PAVEMENT CUTTING

- A. After backfilling trenches or excavations and prior to paving, sawcut existing pavement parallel to the trench or excavation, using a concrete saw, to a minimum depth equal to or greater than one-half the pavement thickness. The pavement shall be cut back a minimum of 12-inches on each side of the trench or excavation wall unless otherwise shown. Any pavement damaged outside these lines shall be re-cut and restored at the expense of the Contractor. Should voids develop under existing pavement during construction, those affected areas shall be sawcut in straight orthogonal lines and replaced after the voids have been filled.

3.02 TEMPORARY PAVEMENT

- A. Temporary resurfacing consisting of not less than 2 inches of hotmix asphalt concrete shall be placed and maintained wherever an excavation is made through an existing pavement. The temporary resurfacing shall be maintained to provide for the safety and convenience of the District. Temporary pavement shall be placed as soon as the condition of the trench backfill is considered by the District to be suitable to receive resurfacing. Temporary resurfacing shall be removed prior to permanent resurfacing. Temporary pavement shall be clearly marked "Temporary Pavement".

3.03 PERMANENT PAVEMENT

- A. Permanent hot mix asphalt (HMA) resurfacing and striping shall be placed in accordance with the contract drawings and Standard Specifications Section 39.

3.04 CONCRETE RESTORATION

- A. Restore all concrete items damaged or otherwise indicated on the plans in accordance with the City of Citrus Heights Standards.
- B. Place concrete in accordance with the requirements of Section 03305 - CONCRETE. Upper 6 inches of subgrade shall be compacted to a minimum 95 percent relative density prior to placement of concrete. Surface finish shall match existing surrounding surface, and shall be approved by the District.

END OF SECTION

SECTION 02825

SECURITY GATE AND OPERATOR

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section covers the work necessary to furnish and install eight-foot-tall permanent steel security fencing. Rolling gate, operator, and appurtenances as shown on the Drawings and specified herein, complete.
- B. High Security gate complete with all hardware; frame, rails, and post, pales, electric motor operated opener, key switch entry and sensor egress opener.
- C. Anti-climb pales shall be installed.

1.02 SUBMITTALS

- A. Contractor shall make the following submittals to the Engineer.
 - 1. Shop drawings of gates with all dimensions, details, and finishes. Drawings must include stamped calculations for post foundations for gate posts. Drawings showing standard pipe section, wall thickness, coating, and other pertinent information for gate posts, end posts, and gates. All drawings shall be stamped by a registered Professional Civil or Structural Engineer licensed in the state of California.
 - 2. Product data: Manufacturer's catalog indicating the steel pale materials and the sliding gate operator.

1.03 DESIGN REQUIREMENTS

- A. The perimeter security fence shall be a fencing system specifically designed to prevent unauthorized entry into the site. Design Requirements:
 - 3. Security Gate system, foundation and installation shall be engineered to withstand wind loading based on CBC 2016 or local code if more stringent.
 - 4. Security Gate design shall be designed to resist climbing and unauthorized entry.
 - 5. Security Gate shall be designed to resist cutting for unauthorized entry.
 - 6. Security Gate shall be designed to resist digging under for unauthorized entry.
 - 7. Security Gate shall be eight (8) feet in height.
 - 8. Security Gate shall be factory power coated (Black).
 - 9. Security Gate shall roll along a steel rail system compatible with the gate.
 - 10. Minimum 10-year manufactures warranty

PART 2 – MATERIALS

2.01 MANUFACTURER

- A. Product manufacturer shall have a minimum of three (3) years' experience manufacturing steel security fencing.
- B. Pales, posts, and gates shall be obtained from a single source.
- C. Manufacturer shall warranty its products for a period of ten (10) years from the date purchased.
- D. Approved rolling gate operator: Doorking Model 9150 Sliding Gate Operator, 208V or approved equal.
- E. Security Gate: Ameristar, "Passport IS Gauntlet Industrial Roll Gate" or approved equal.
- F. The District will provide locks and keys for gates.

2.02 GENERAL

- A. All fencing materials shall be hot-dip galvanized and powder coated after fabrication. The fencing system shall conform to ANSI/ASCE 7-98 Exposure Category C for wind load.

2.03 STEEL

- A. Steel posts, pales, rails, supports, and related items shall be hot rolled sections in compliance with AASHTO M 270M, Grade 250.

2.04 GATE

- A. Pales shall be 1" x 1" x 12-gauge tube steel. Top rails shall be 2 ½" x 1 ¾" x 10 gauge channels. Bottom rail shall be 4" x 2" x 3/16" tube steel. End posts shall be 2" x 2" x 1/8" tube steel.
- B. Phineals
 - 1. Decorative cast phineals shall be selected by the District.
- C. Anti-sag supports
 - 1. One anti-sag support to suit pale specifications.
- D. Nuts, bolts, and fixings
 - 1. Nuts, bolts, and fixings shall be anti-vandal shear nuts supplied by the manufacturer.
- E. Corrosion Protection
 - 1. All posts, rails, pales, connector plates and mild steel sections shall be hot-dipped galvanized after fabrication according to AASHTO M111. All bolts, nuts, washers, and anchors shall be galvanized according to AASHTO M232.
- F. Powder Coating
 - 1. All exposed surfaces of the fence shall be coated with an electrostatic polyester, TQTC powder coating, color as selected by the Owner, with

high UV stability, impact, corrosion, heat, and humidity resistance. Finish coating shall be a minimum thickness of 0.15mm. Finish system shall be subject to ASTM B117 – Salt Spray (fog) test – 1,000 hours. The coated steel shall have no visible evidence of rust.

2. Color: Black

2.05 CONCRETE

- A. Concrete for post foundations shall be the same as specified in Section 03301-CONCRETE.

2.06 ROLLING GATE OPERATOR

- A. Operator and motor

1. The rolling gate operator shall use a microprocessor based solid-state control board that controls all functions of the operator. The rolling gate operator shall include two (2) convenience outlets, built-in power switch and built-in reset switch. The operator shall meet the following requirements:
 - a. ½ HP continuous duty motor operates at 115V with a 208V to 115V transformer.
 - b. The pulling medium consists of #40 roller chain.
2. The gate operator speed shall be set at 1 foot per second.
3. The gate operator shall have two convenience outlets available for accessory transformer power, and also have a built-in lockable power disconnect and reset switch.
4. A positive dead bolt shall operate in a fail-safe mode, i.e.: only when the gate is forced open, to reduce solenoid lock wear and failure, or be capable of operating in a fail-secure mode, i.e.: after each operation.

- B. Control Circuit

1. The rolling gate operator shall use a model 4602 microprocessor based control board.
2. An adjustable timer shall be built into the control board to allow the gate to automatically close.
3. Operator shall allow a stop, or a stop and reverse function (settable) from a safety related input.
4. A dry set of relay contacts shall be available for external use, and shall have four programmable functions.
5. A special input shall allow the gate to be partially opened.
6. A timer override function shall cause an opening gate to stop and then reverse direction when the reverse loop(s) or reverse input is clear even if the gate has not reached the full open position, to help reduce tailgating.
7. Control board shall have separate inputs for external contact and non-contact entrapment protection devices.
8. Functions will be user programmable by DIP-switches located on the

control board.

C. Inherent Reverse

1. The rolling gate operator shall be designed in such a way that if an obstruction is met during the opening or closing cycles, the gate operator will automatically reverse the gate.
2. For enhanced safety, the control board shall check the primary entrapment sensing system circuit at each cycle of the operation. Should the control board detect a fault in the system, the motor shall not be allowed to start.
3. This reverse system shall be inherently designed into the operator so that if the external reverse devices fail or become inoperative, the operator will still have the capability to sense the obstruction and reverse the gate.
4. The inherent reverse system in the gate operator shall consist of a primary sensing system that will reverse the gate if an obstruction is sensed. Should the primary system fail or become inoperative, a secondary inherent system will sense the obstruction and reverse the gate.
5. The primary system shall sense a slowdown of gate travel speed and reverse the gate.

D. Entrapment Protection

1. The rolling gate operator shall stop and activate the internal alarm upon sensing an entrapment (two sequential activations of the inherent sensing system) and shall require activation of the reset switch prior to returning to normal operation, as required by UL 325 safety standard.
2. For enhanced safety, the operator shall, upon sensing an entrapment, release pressure on the gate and shall assume a fail-safe condition to allow any entrapment the opportunity to free itself without the need of outside intervention.

E. Manual Release

1. The rolling gate operator shall incorporate a "fail-safe" design that will allow manual operation of the gate from either the inside or the outside without the need of any hand cranks, keys or other mechanical devices, as the primary manual release device.
2. The manual release device shall be affixed to the operator and be capable of being quickly operated in an entrapment situation and must be an integral (non-removable) part of the operator. A single non-repetitive movement shall cause an action that will allow the gate to be manually operated. The manual release or manual operation of the gate shall not result in a risk of injury to persons if the operator is activated while the manual release is activated or being used.

F. Additional equipment

1. Loop Detectors: The rolling gate operator shall be equipped with loop detectors installed on the inside of the gate. The loop detector shall open the gate for traffic leaving the facility. The loop detector shall be capable

of detecting approaching traffic over the full width of the gate. The loop detector shall have a sensitivity boost feature, frequency measurement indicating the operating frequency of the loop upon powering up or reset, and a loop frequency monitor feature. The loop detector shall be Model 9406 Single Channel Loop Detector as manufactured by DoorKing, Inc., or approved equal.

2. Photo-cells: The rolling gate operator shall be equipped with a photoelectric sensor to be used as a secondary entrapment protection device, preventing the gate from closing on persons or vehicles. The photoelectric sensor shall be capable of sensing an obstruction over the entire open width of the gate. The sensor shall be 42 VAC, using diffuse reflective sensing method effective to a minimum distance of 30 feet. The sensor shall have an infrared light source. Connection shall be $\frac{3}{4}$ - 14npt conduit/screw terminals. The photoelectric sensor shall be OMRON Type E3K-R10K4.

2.07 HIGH SECURITY KEY BOX

- A. Provide Knox Box, coordinate with Sacramento Metropolitan Fire District for required keying and model numbers.
- B. Surface mount with cast-in-place or epoxy anchors.
- C. Mount to precast wall panel or column, coordinate with precast manufacturer.

PART 3 – EXECUTION

3.01 ROLLING GATES

- A. Rolling gates shall be installed to the manufacturers specifications. Gates shall use a bearing roller riding a ground track for the entire rolling length of the gate. Gates posts shall be equipped with roller guides at the top, slide lock, and a lock plate at the closed end. The fabric shall be the same as that used for the fence and shall be rigidly attached to the frames.

3.02 ROLLING GATE OPERATOR

- A. Rolling Gate Operator shall be installed by qualified technicians who have been factory trained and certified.
- B. Provide a DoorKing Model 9150 designed to be mounted directly to a concrete pad, firmly secured, plumb, and level.
- C. Provide a pole mounted key switch with all mounting poles, hardware and concrete footing on each side of the gate (inside and outside). The outside pole shall have a Knox Key switch in addition to the normal entry switch.
- D. Wiring shall be uniform and in accordance with national electric codes and manufacturers' instructions.
- E. Equipment shall be mounted directly to a concrete pad, and all splices shall be in easily accessible junction boxes or on terminal boards. All cable runs in

all junction boxes shall be tagged and identified. Signs shall be posted as indicated by the manufacturer.

- F. System shall be turned on and adjustment made to meet requirements of specifications and on-site conditions. System shall function as specified.

3.03 SYSTEM TEST PROCEDURES

- A. System shall be completely tested to assure that all components, and accessories are hooked-up and in working order.
- B. System shall be pre-tested by Contractor and certified to function in accordance with plans and specifications.
- C. System shall be tested in presence of Owner's representative.

3.04 OWNER INSTRUCTION

- A. Contractor shall conduct up to one (1) hour of instruction in use and operation of the system to designated Owner representatives, within thirty (30) days of acceptance.
- B. Installation Contractor shall conduct up to one (1) hour of technical training, in troubleshooting and service of the system, to designated Owner representatives within ninety (90) days of system acceptance.

3.05 MANUALS AND DRAWINGS

- A. Contractor shall provide Owner with two (2) copies of standard factory prepared operation, installation and maintenance manuals. Manuals shall include typical wiring diagrams.
- B. Contractor shall provide Owner with two (2) copies of any riser, layouts, and special wiring diagrams.
- C. Any galvanized coating damaged during construction of the fencing shall be repaired as stated in Section 09905-PAINTING.

END OF SECTION

SECTION 03301

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Cast-in-place concrete.
2. Reinforcing steel.
3. Forms.
4. Concrete accessories.

B. Related sections:

1. Additional requirements specified elsewhere:
 - a. Submittals – Section 01330
 - b. Quality Control: Section 01400
2. Related Work specified elsewhere:
 - c. Demolition: Section 02072
 - d. Earthwork: Section 02200
 - e. Grout: Section 03600
 - f. Anchor Bolts and Expansion Anchors: Section 05501
 - g. Sealants and Caulking: Section 07900
 - h. Painting: Section 09905

1.02 REFERENCES

A. Reference standards:

1. Latest version of all.
2. ACI 214: Recommended Practice for Evaluating Compression Test Results of Field Concrete.
3. ACI 224: Control of cracking in Concrete Structures.
4. ACI 224.3: Joints in Concrete Construction.
5. ACI 301: Specifications for Structural Concrete.
6. ACI 305: Recommended Practice for Hot Weather Concreting.
7. ACI 306: Recommended Practice for Cold Weather Concreting.
8. ACI 306.1: Standard Specifications for Cold Weather Concreting.
9. ACI 315: Manuals of Standard Practice for Detailing Reinforced Concrete Structures.
10. ACI 318: Building Code Requirements for Reinforced Concrete.
11. ACI 347: Recommended Practice for Concrete Formwork.
12. ACI 350: Environmental Engineering Concrete Structures.
13. ASTM A82: Cold-Drawn Steel Wire for Concrete Reinforcement.
14. ASTM A185: Welded Wire Fabric for Concrete Reinforcement.
15. ASTM A497: Welded Preformed Steel Wire Fabric for Concrete

Reinforcement.

16. ASTM A615: Deformed Billet-Steel Bars for Concrete Reinforcing.
17. ASTM C31: Making and Curing Concrete Test Specimens in the Field.
18. ASTM C33: Concrete Aggregate.
19. ASTM C39: Test for Compressive Strength for Cylindrical Concrete Specimens.
20. ASTM C94: Ready-Mixed Concrete.
21. ASTM C127: Test for Specific Gravity and Adsorption of Coarse Aggregate.
22. ASTM C128: Test for Specific Gravity and Adsorption of Fine Aggregate.
23. ASTM C136: Test for Sieve or Screen Analysis of Fine and Coarse Aggregates.
24. ASTM C143: Test for Slump of Portland Cement Concrete.
25. ASTM C150: Portland Cement.
26. ASTM C192: Making and Curing Concrete Test Specimens in the Laboratory.
27. ASTM C231: Test for Air Content of Freshly Mixed Concrete.
28. ASTM C260: Air Entraining Admixtures for Concrete.
29. ASTM C494: Chemical Admixtures for Concrete.
30. ASTM C618: Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement.
31. PS1: Construction and Industrial Grade Plywood (ANSI A199.1).

1.03 SUBMITTALS

- A. Product Data and Shop Drawings:
 1. Reinforcing bar lists and fabrication placement and Drawings.
 2. Product information for all additives, sealers, form ties, form coating, waterstops, and accessories.
 3. Concrete mix design.

1.04 QUALITY ASSURANCE

- A. Tolerances: ACI 301 and ACI 347 as modified herein. In case of conflict ACI 347 governs over ACI 301.
- B. Compliance with the requirements specified herein may necessitate modification to the manufacturer's standard material or equipment.
- C. Concrete mix design:
 1. Contractor to provide and pay for the concrete mix design.
 2. Test the proposed concrete mix for each size and gradation of aggregates and each consistency intended for use in the project.
 3. Aggregates:
 - a. Sample and test according to ASTM C33.
 - b. Determine bulk specific gravity in accordance with ASTM C127 and C128.
 4. Compression tests:

- a. Prepare two (2) sets of compression test cylinders from each proposed concrete mix, three (3) cylinders per set.
- b. Test one (1) set of three (3) cylinders at seven (7) days, the other at 28 days.
- c. Make, cure, and store in accordance with ASTM C192.
- d. Test in accordance with ASTM C39.
5. Slump test: ASTM C143.
6. Total air content: ASTM C231.
7. Initial set test:
 - a. In accordance with ASTM C403.
 - b. Test at 70 degrees F and 90 degrees F ambient.
 - c. Test at 70 degrees F on mix including specified plasticizing and air entraining admixtures.
 - d. Test at 90 degrees F on mix including specified retarding and air entraining admixtures.
8. Fly ash: Supplier's chemical composition and physical analysis test.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Storage and protection:
 1. Cement and fly ash.
 - a. Store in moisture proof enclosures.
 - b. Do not use if caked or lumpy.
 2. Aggregate.
 - a. Store to prevent segregation and inclusion of foreign materials.
 - b. Do not use the bottom 6 inches of piles in contact with the ground.
 3. Reinforcing steel: Store on supports that will keep it from contact with the ground.
 4. Rubber and plastic materials.
 - a. Store in a cool place.
 - b. Do not expose to direct sunlight.
 5. Sealers, form coatings, etc.
 6. Store indoors according to manufacturer's request.
 - a. Discard any improperly stored materials.
- B. Acceptance at site:
 1. Prepare a delivery ticket for each load of ready-mixed concrete.
 2. Truck operator shall hand ticket to Engineer at the time of delivery.
 3. Ticket to show actual:
 - a. Quantity delivered.
 - b. Actual amount of each material in batch.
 - c. Outdoor temperature in the shade.
 - d. Time at which cement was added.
 - e. Truck, project, and mix design identification number.
 4. Failure to provide the delivery ticket will be cause to reject the load.

1.06 PROJECT/SITE CONDITIONS

A. Environmental requirements: Refer to Section 02000

PART 2 – PRODUCTS

2.01 MATERIALS

A. Forms:

1. Prefabricated: Simplex "Industrial Steel Frame Forms," Symons "Steel Ply," Universal "Uniform," or equal.
2. Plywood: PS1, waterproof resin-bonded, exterior type Douglas Fir; face adjacent to concrete, Grade B or better.
3. Fiberboard FS LLL-B-810, Type IX, tempered, waterproof, screen back, concrete form hardboard.
4. Lumber: Straight; uniform width and thickness; and free from knots, offsets, holes, dents, and other surface defects.
5. Form coating: Industrial lubricants "Nox-crete Form Coating," W. R. Meadows "Duogard," PRECO "Reebol Form Cote," or equal.
6. Form ties: Removable end, permanently embedded body type not requiring auxiliary spreaders, with cones on outer ends, embedded portion 1-inch minimum back from concrete face. If not provided with threaded ends, constructed for breaking off ends without damage to concrete.

B. Reinforcing steel:

1. Bars: ASTM A615, Grade 60.
2. Beam stirrups and column ties: ASTM A615, Grade 40.
3. Welded wire fabric: ASTM A185 or A497.
4. Bar supports: PS7; CRSI Class B or E, fabricated from galvanized wire or having stainless steel legs.

C. Concrete:

1. Cement: ASTM C150, Type II or Type II LA.
2. Fly ash: ASTM C618, Class F, except loss on ignition not more than 5 percent.
3. Fine aggregate: clean, natural sand ASTM C33, or natural materials processed to conform to ASTM C33.
4. Coarse aggregate: crushed rock, natural gravel, or other inert granular material, ASTM C33 except clay and shale particles no more than 1 percent.
5. Water: clean and free of deleterious substances.
6. Admixtures:
 - a. Retarder: ASTM C494, Type D; Grace "Duratard-HC," Master Builders "Pozzolith 300-R," Protex "Protard," Sika Chemical "Plastiment".
 - b. Plasticizer: ASTM C494, Type A; Grace "Daracem-100," Master Builders "Rheobuild 1000".
 - c. Air entraining agent: ASTM C260; Grace "Darex AEA," Master Builders "Micro-Air," W. R. Meadows "Sealtight".

- d. Water reducer: Master Builders "Pozzolith 322N".
- e. Or equal.

D. Accessories:

- 1. Vapor retarder polyethylene film: 8 mil, ASTM E154.
- 2. Membrane curing compound and floor sealer:
 - a. Operations Control Building floor slab: Crete-seal 2000, manufactured by Crete-Seal, Inc., or equal product with 10-year warranty to replace flooring in event of adhesion failure during warranty period. (No known equal.)
 - b. All others to be FS TT-C-600, Type 1; Protex, triple seal; chlorinated rubber, min 18 percent solids; Grace "Dekote:", Process Solvent "Concrete Treatment ALX-9", TK Products :Tri-Kote TK-18", or equal.
- 3. Expansion material:
 - a. Sponge rubber expansion joint filler, ASTM 1501-71, ASTM D1752-83, Type 1.
 - b. Acceptable manufacturers:
 - 1) W.R. Meadows.
 - 2) Epoxy Industries Inc.
 - 3) Sonneborn.
 - 4) Or equal.
- 4. Epoxy bond coat: W. R. Meadows, "Intralok," Grace "Duraweld-C," Sika "Armatec," Permagile Industries, Inc., 1-215 HM; Poly Carb, Mark-25-3, or equal.

2.02 MIXES

- A. Design concrete mix within limits specified.
- B. Comply with ASTM C94.

C. Cement content:

1. Minimum Portland Cement, lbs/cu yd, for concrete containing a water reducing admixture:

Concrete Slump	Coarse Aggregate Size No. 4 Sieve to 1" Aggregate	Coarse Aggregate Size from No. 4 Sieve to			Concrete Toppings 3/8"	Controlled Density Fill 3/8"
		1/2"	3/4"	1"		
2"	458	573	545	517	-	-
3"	500	592	564	536	-	-
4"	542	611	583	555	700	-
6"	-	-	-	-	-	275

2. If water reducing admixture is omitted, increase cement content 10 percent.
3. Contractor may substitute fly ash for up to 15 percent of cement at a rate of 1.5 lbs fly ash for each 1 lb of cement.

D. Water cement ratio:

1. For concrete containment structures the water cement ratio shall not exceed 0.45. If fly ash is used the cement-plus-fly ash ratio (W/C+F) shall not exceed 0.40.
2. For concrete non-containment structures and thrust blocks the water cement ratio w/c shall not exceed 0.45.
3. Controlled density fill shall be a mixture of cement, Class F Pozzolan and coarse aggregate. The 3/8-inch coarse aggregate shall not exceed 25 percent of total aggregate. Air entrainment is required. Water cement ratio W/C shall not exceed 0.50.

E. Slump:

1. Structures: Maximum 4-inch slump.
2. Thrust blocks: Maximum 6-inch slump.
3. Controlled density fill: Maximum 6-inch slump.

F. Volume ratio of fine to total aggregates:

<u>Coarse Aggregate Size</u>	<u>Minimum Ratio</u>	<u>Maximum Ratio</u>
3/8"	0.45	0.50
1/2"	0.40	0.50
3/4"	0.35	0.50
1"	0.30	0.46
1-1/2"	0.25	0.42

G. Initial set:

1. 5-1/2 hours +1 hr after water and cement are added to the aggregates as determined by ASTM C403.
2. Adjust retarder quantities to compensate for temperature and job condition variations.

H. Volumetric air content:

1. 6 percent +1 percent after placement.

I. Admixtures:

1. Content, batching method, and time of introduction in accordance with the manufacturer's recommendations for compliance with this specification.
2. Include a water reducing admixture.
3. Calcium chloride is not permitted.
4. Superplasticizer may be required. A separate submittal and approval are required

J. Strength: Minimum compressive strength as determined by ASTM C39 for concrete structures:

<u>Age</u>	<u>Concrete Structures Minimum Strength</u>	<u>Thrust Block Minimum Strength</u>	<u>Controlled Density Fill</u>	
			<u>Non-Structural Minimum Strength</u>	<u>Structural Minimum Strength</u>
7 days	2,500 psi	2,000 psi	-	-
28 days	4,000 psi	3,000 psi	100 psi	1,200 psi

K. Consistency:

1. Suitable for the placement conditions.
2. Slump uniform.
3. Aggregate floating uniformly throughout the concrete mass.
4. Flow sluggishly when vibrated or spaded.

2.03 SOURCE QUALITY CONTROL

A. Test reports:

1. Submit reports of tentative concrete mix design and testing including:
 - a. Slump on which the design is based.
 - b. Total gal of water per cu yd.
 - c. Brand, type, composition, and quantity of cement.
 - d. Brand, type, composition, and quantity of fly ash.
 - e. Specific gravity and gradation of each aggregate.
 - f. Ratio of fine to total aggregates.
 - g. Surface-dry weight of each aggregate per cu yd.
 - h. Brand, type, ASTM designation, active chemical ingredients and quantity of each admixture.
 - i. Air content.
 - j. Compressive strength based on 7 day and 28 day compression tests.
 - k. Time of initial set.
2. Submit suppliers certified fly ash test reports for each shipment delivered to concrete supplier.
 - a. Physical and chemical characteristics.
 - b. Certification of compliance with the specifications.
 - c. Signed by Contractor and concrete supplier.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Forms:

1. Design to produce hardened concrete to the shape, lines, and dimensions indicated on the Drawings.
2. Conform to ACI 347 as modified herein.
3. Surfaces exposed to view.
 - a. Prefabricated plywood panel forms, job-built plywood forms, or forms lined with plywood or fiberboard.
 - b. Line specific areas with architectural form liner as shown on Drawings.
 - c. Laid out in a regular and uniform pattern with long dimensions vertical and joints aligned.
 - d. Produce finished surfaces free from offsets, ridges, waves, and concave or convex areas.
 - e. Maximum deviation from a true plane: 1/8-inch in 6 feet.
4. Plywood or lined forms are not required for surface (buried by backfill) not normally submerged or not normally exposed to view.
5. Other types of forms may be used:
 - f. For surfaces not restricted to plywood or lined forms.
 - g. As backing for form lining.
6. Provide forms above all extended footings.
7. When placing concrete against gravel or crushed rock not containing 25 percent minimum material passing a No. 4 sieve:

- h. Provide polyethylene film to protect concrete from water loss.
 - i. Lap joints 4 inches.
 8. Provide substantial forms sufficiently tight to prevent leakage of mortar.
 9. Brace or tie forms to maintain desired position, shape, and alignment during and after concrete placement.
 10. Size and space walers, studs, internal ties and other form supports so proper working stresses are not exceeded.
 11. Form concrete column supported beams and slabs so column forms may be removed without disturbing beam and slab form supports.
 12. Where the top of a wall will be exposed to weathering, stop form on at least one side at true line and grade.
 13. Other locations to be finished to a specified elevation, slope, or contour, bring form to true line and grade and provide a wooden guide strip at the proper location in the forms for finishing the top surface with a screed or template.
 14. At horizontal construction joints in walls, stop the forms on one side not more than 2 feet above the joint.
 15. Provide temporary opening at the bottom of columns and wall forms and wherever necessary for cleaning and inspection.
 16. Install form ties on exposed surfaces in uniformly spaced vertical and horizontal rows.
 17. Provide chamfer strips.
 - a. To bevel salient edges and corners.
 - b. To bevel salient edges of equipment bases.
 - c. 3/4-inch bevel.
 18. Do not remove or disturb until concrete has attained sufficient strength to safely support all dead and live loads.
 19. Leave shoring beneath beams and slabs in place and reinforce as required by construction equipment and materials.
 20. Remove forms carefully to prevent surface gouging, corner or edge breakage and other damage.
- B. Reinforcing steel:
 1. Accurately position reinforcing steel on supports, spacers, hangers, or other reinforcing steel.
 2. Secure with wire ties or suitable clips.
 3. Except at contact splices, minimum clear distance between bars, the greater of:
 - a. Nominal diameter of bars.
 - b. 1.5 times maximum size of coarse aggregate.
 - c. 1-1/2 inch in columns.
 - d. 1-inch in beams.
 - e. 2 inches in other locations.
 4. Where beam reinforcement is placed in 2 layers, place bars in upper layer directly above bars in lower layer.
 5. Do not install reinforcement for beams and slabs that are supported by concrete columns until after the concrete for the column has been placed.

6. Fabricate in accordance with ACI 315 and ACI 318 except as specified or indicated on Drawings.
7. Accurately formed.
8. Free from loose rust, scale, and contaminants that will reduce bond.
9. Splices:
 - a. As indicated on the Drawings.
 - b. Do not weld or tack weld reinforcing steel except where specifically indicated on Drawings.
 - c. Remove and replace steel upon which any unauthorized welding has been performed.
 - d. When splicing bars in tie beams subject to tensile loading, splice no more than half the bars within a length of 40 bar diameter and hook each spliced bar end 180 degrees.
10. Do not bend or rebend reinforcing steel at job site. Bending of steel in locations not shown on Drawings shall be cause for rejection of work.

C. Embedments:

1. Accurately position and securely anchor in forms all anchor bolts, casting, steel shapes, conduit, sleeves, masonry anchorages, and other materials to be embedded in concrete.
2. Anchor bolts:
 - a. Provide sufficient threads on anchor bolts to permit a nut on the concrete side of the form or template.
 - b. Install a second nut on the other side of the form or template.
 - c. Adjust the nuts to hold the bolt rigidly in the proper position.
3. Clean embedments before installation.
4. Clean concrete spatter and other foreign substances from surfaces not in contact with concrete.

D. Concrete:

1. Notify Engineer not less than 24 hours in advance of the times and places at which Contractor intends to place concrete.
2. Predetermine limits at each pour.
3. Place all concrete within limits of pour in one (1) continuous operation.
4. Rigidly secure forms, reinforcing steel, water stops, and anchor bolts in proper position.
5. Remove all mud, water, and debris from space to be occupied by concrete.
6. Clean surfaces encrusted with dried concrete from previous concrete operations.
7. Bonding to hardened concrete:
 - a. Place new concrete on rough, clean, damp faces of existing concrete.
 - b. Remove surface mortar to expose aggregate.
 - c. Clean hardened concrete of all foreign substances, including curing compound.
 - d. Wash with clean water, and keep saturated for 24 hours preceding placement of fresh concrete.

- e. Omit coarse aggregate from the first batch or batches of concrete placed on hardened concrete in wall and column forms.
- f. The mortar puddle shall cover the hardened concrete to a depth of at least 2 inches at every point.
- 8. Epoxy bonding:
 - a. Apply epoxy bonding agent per manufacturer's recommendation on surfaces identified on the Drawings.
- 9. Conveying concrete:
 - a. Convey to the point of final deposit by methods that will prevent separation or loss of ingredients.
 - b. Place concrete in final position without being moved laterally more than 5 feet.
- 10. Placing concrete:
 - a. Place concrete in approximately horizontal layers of proper depth for proper compaction, not more than 2 feet.
 - b. Place subsequent layer while the preceding layer is still plastic.
 - c. Fill form at a rate not less than 2 ft/hr.
 - d. Do not allow concrete to free fall more than 4 feet in walls and columns.
 - e. Provide vertical construction joints as required to comply with these requirements and as shown on the Drawings.
 - f. Place and compact concrete in wall or column forms before placing any reinforcing steel in the system to be supported by the walls and columns.
 - g. Limit portions of columns and walls poured monolithically with floor on roof slabs to 6-foot vertical height.
 - h. Allow concrete in walls and columns to settle at least two (2) hours before concrete is placed in structural systems to be supported by the walls and columns.
 - i. Top finish concrete when thoroughly settled.
 - j. Remove all laitance, debris, and surplus water from the tops of the forms by screeding, scraping, or other effective means.
 - k. Overfill the forms for walls whose tops will be exposed to the weather and screed off the excess after the concrete has settled.
- 11. Compaction:
 - a. Thoroughly compact concrete during and immediately after placement.
 - b. Work concrete around all reinforcements and embedments and into the corners of the forms.
 - c. Use mechanical vibrators which will maintain 9,000 cycles/min when immersed in the concrete, 1-1/2 hp motor min.
- 12. Cold weather concreting:
 - a. Comply with ACI 306 and 306.1, except as modified herein.
 - b. Minimum concrete temperature at the time of mixing:

Outdoor Temperature	Concrete Temperature
<u>at Placement (in shade)</u>	<u>at Mixing</u>

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Below 0° F	70° F
Between 0° F & 30° F	65° F
Between 30° F & 45° F	60° F
Above 45° F	45° F

- c. Do not place heated concrete which is warmer than 80 degrees F.
 - d. If freezing temperatures are expected during curing, maintain the concrete temperature at or about 50 degrees F for five (5) days or 70 degrees F for three (3) days.
 - e. Do not allow concrete to cool suddenly.
 - f. Do not place concrete on frozen subgrade.
13. Hot weather concreting:
- a. Comply with ACI 305, except as modified herein.
 - b. If the air temperature is expected to be 90 degrees F or greater in the next 24 hours.
 - 1) Keep concrete as cool as possible before, during, and after placement.
 - 2) Do not allow concrete temperature to exceed 85 degrees F at placement.
 - 3) Prevent plastic shrinkage cracking due to rapid evaporation of moisture.
 - 4) Addition of ice, or other cooling methods, will be required to meet temperature requirements.
 - c. Do not place concrete when the actual or anticipated evaporation rate equals or exceeds 0.2 lbs/sq ft/hr as determined from ACI 305.
 - d. Concrete placed under "Hot Weather" conditions shall be water cured.

E. Construction joints:

- 1. Locations:
 - a. As indicated on the Drawings, and if not shown, joint spacing shall not exceed ACI recommendations.
 - b. In columns and walls:
 - 1) At the underside of beams, girders, haunches, drop panels, column capitals, and at floor panels.
 - 2) Haunches, drop panels, and column capitals are considered part of the supported floor or roof and shall be placed monolithically therewith.
 - 3) Column bases need not be placed monolithically with the floor below.
 - c. In beams and girders:
 - 1) At the middle of the span unless a beam intersects a girder at this point.
 - 2) If the middle of the span is at an intersection of a beam and girder, offset the joint in the girder a distance equal to twice the beam width.

- 3) Provide satisfactory means for transferring shear and other forces through the construction joint.
 - d. In suspended slabs:
 - 1) At or near the center of span in flat slab or T-beam construction.
 - 2) Do not locate a joint between a slab and a concrete beam or girder unless so indicated on the Drawings.
 - e. Install construction joints in beams, slabs, and girders perpendicular to the planes of their surfaces.
- F. Expansion and contraction joints:
1. Contraction joints:
 - a. Provide as indicated on Drawings.
 - b. Seal accessible edges.
 - c. Waterstop embedment equal on each side of the joint.
 - d. Splice water stops in strict conformity with the manufacturer's instructions.
 2. Expansion material:
 - a. Provide as indicated on Drawings.
 - b. Firmly bond to previously poured joint. Face with a suitable adhesive.
 - c. Pour new concrete directly against joint filler.
 - d. Seal accessible edges.
- G. Finishing unformed surfaces:
1. Do not finish buried or permanently submerged concrete not forming an integral part of a structure except as required to attain surface elevations, contours, and freedom from laitance.
 2. Screed and initial float finish followed by additional floating, and troweling as required, all other surfaces.
 3. Screeding:
 - a. Screed concrete surfaces to the proper elevation and contours with all aggregates completely imbedded in mortar.
 - b. Surface free of irregularities of height or depth more than 1/4 inch measured from a 10-foot straightedge.
 4. Floating:
 - a. Float finish screeded surfaces as soon as the concrete has stiffened sufficiently for working.
 - b. Remove and replace with mortar any coarse aggregate which is disturbed by the float or which causes a surface irregularity.
 - c. Initial floating to produce a surface of uniform texture and appearance without unnecessary working of the surface.
 - d. Follow initial floating with a second floating at the time of initial set.
 - e. Second floating to produce a finish of uniform texture.
 - f. Except as otherwise specified, the second floating finish is the final finish.
 - g. Use hand floats or mechanical compactor floats.
 5. Broom finish:
 - a. Broom finish exterior slabs.

- b. Broom after second floating and at right angles to normal traffic.
 - 6. Troweling:
 - a. Steel trowel finish interior floor surface which will be exposed at the completion of construction, the exposed portion of the equipment bases, interior curbs, and where indicated on the Drawings.
 - b. Do not trowel floor surfaces which will be normally submerged.
 - c. Trowel after the second floating when the surface has hardened adequately to prevent drawing an excess of fines to the surface.
 - d. Trowel to produce a dense, smooth, uniform surface free from blemishes and trowel marks.
 - 7. Aggregate exposure:
 - a. Remove surface mortar from surfaces to be covered later with concrete or mortar topping.
 - b. Expose coarse aggregates to improve bonding.
 - 8. Unless specified to be beveled, edge floated or troweled surfaces with a tool having a 1/4-inch radius.
- H. Curing:
- 1. Protect concrete from moisture loss for at least seven (7) days after placement.
 - 2. Cure concrete by methods that will keep concrete surfaces adequately wet during curing.
 - 3. Water curing:
 - a. Begin water saturation as quickly as possible after initial set.
 - b. Regulate water application to provide complete surface coverage with a minimum of runoff.
 - c. Use absorptive blankets to hold moisture to concrete and/or flood the surface.
 - d. Concrete placed under "Hot Weather" conditions shall be water cured.
 - 4. Membrane curing:
 - a. Membrane curing compound may be used in lieu of water curing on concrete which will not be covered later with mortar or concrete where water curing is not specifically called for.
 - b. Spray apply membrane curing compound at not more than 300 sq ft/gal.
 - c. Cover unformed surfaces within 30 minutes of final finishing.
 - d. If forms are removed before the end of the curing period, immediately apply curing compound to the formed surfaces before they dry out.
 - e. Protect curing compound against abrasion during the curing period.
 - 5. Film curing:
 - a. Polyethylene sheeting may be used in lieu of water curing on concrete which will be covered later with mortar or additional concrete, or will otherwise be covered or hidden from view where water curing is not specifically called for.
 - b. Begin film curing as quickly after initial set of the concrete as possible.
 - c. Completely cover the surfaces with polyethylene sheeting.
 - d. Overlap the sheeting edges for sealing and anchorage.

- e. Seal joints between sheets.
 - f. Promptly repair tears, holes, and other damages.
 - g. Anchor covering continuously at edges and on the surfaces as required to prevent billowing
 - h. Concrete placed under "Hot Weather" conditions shall be water cured.
- I. Finishing formed surfaces:
- 1. Remove fins and other surface projections from all formed surfaces except exterior surfaces that will be in contact with earth backfill and are not specified to be dampproofed.
 - 2. Use a power grinder, if necessary, to remove projections and provide a flush surface.
 - 3. Remove fins and fill tie hole on surfaces to be dampproofed but do not do any other finishing of those surfaces.
 - 4. Tie holes:
 - a. Clean, wet and fill with patching mortar.
 - b. Finish flush to match the texture of adjacent concrete.
 - 5. Grout - cleaned finish:
 - a. ACI 301, 5.3.3.4.b.
 - b. Grout clean surfaces to produce a smooth uniform surface free of marks, voids, surface glaze, and cement dust.
 - c. Grout clean all surfaces exposed to view, interior of tanks and surfaces indicated on Drawings.
 - d. Fill all voids, regardless of location, that are 1/4-inch deep or 1/2-inch diameter.
- J. Vapor barriers:
- 1. Provide vapor retarder beneath each concrete slab poured directly on grade.
 - 2. Seal joints in the film with waterproof sealing tape.
 - 3. Take care to prevent damaging the film.
 - 4. Promptly repair damage and inspect for damage immediately before the concrete is placed.

3.02 FIELD QUALITY CONTROL

- A. Owner or Engineer furnished:
- 1. Perform field control test:
 - a. Tests by qualified personnel.
 - b. Make tests in presence of Engineer.
 - c. Provide all equipment, supplies, and the services of one (1) or more employees, as required.
 - d. The test frequencies specified are minimum, perform additional tests as required by the job conditions.
 - 2. Aggregate gradation: Sample and test in accordance with ASTM D75 and C136.
 - a. Fine aggregates: Each 100T.

- b. Coarse aggregates: Each 200T.
 3. Fly ash: Sample and test each 25T in accordance with ASTM C143.
 4. Slump: perform a test for each truck load in accordance with ASTM C143.
 5. Air content: Test a sample from one the first three batches made each day in accordance with ASTM C231.
 6. Compression tests:
 - a. Make one (1) set of four (4) cylinders from each truck load.
 - b. Test one (1) cylinder in each set at SEVEN (7) days.
 - c. Test two (2) cylinders in each set at 28 days.
 - d. The other cylinder is to be a spare to be tested at the Engineer's discretion.
 - e. Engineer will evaluate in accordance with ACI 214 and ACI 318.
 - f. Prepare, cure, store, and deliver cylinders in accordance with ASTM C31.
 - g. Test in accordance with ASTM C39.
 - h. Mark or tag each set of test cylinders with the date and time of day the cylinders were made, the location in the work where the concrete represented by the cylinders was placed, the delivery truck or batch number, the air content, and the slump.
- B. Contractor furnished:
1. Provide materials from each truck for test cylinders.
 2. Cooperate with testing agency to provide test prior to placement of each load.
 3. Provide all mix design testing.
 4. Pay for all retesting of concrete which does not meet specifications during the initial test.

END OF SECTION

SECTION 03400

PRE-CAST CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. The Contractor shall provide and install all pre-cast items as required including all appurtenances necessary to make a complete installation. Electrical pre-cast pullboxes and vaults are included in this section.

B. References

ACI 318	Building Code Requirements for Structural Concrete
ACI 350	Code Requirements for Environmental Engineering Concrete Structures and Commentary
ACPA	Concrete Pipe Handbook
ACPA	Design Manual
AWS D1.1	Structural Welding Code – Steel
AWS D1.4	Structural Welding Code – Reinforcing Steel
NPCA	QC Manual Quality Control Manual for Precast Concrete Plants
PCI	Design Handbook

1.02 GENERAL REQUIREMENTS

A. Precast concrete units shall be designed and fabricated by an experienced and acceptable precast concrete manufacturer. The manufacturer shall have been regularly and continuously engaged in the manufacture of precast concrete units similar to that indicated in the project specifications or drawings for at least 5 years.

1.03 SUBMITTALS

A. The following items shall be submitted in compliance with Section 01330-Submittals Procedures:

1. Quality control procedures established by the precast manufacturer in accordance with the NPCA Quality Control Manual for Precast Concrete Plants.
2. Shop Drawings
 - a. The drawings for precast concrete units shall be shop drawings furnished by the precast concrete producer for approval by the Owner's representative and engineer of record. These drawings shall demonstrate that the applicable industry design standards have been met. These drawings shall show complete design, exact dimensions,

installation, and construction information in such detail as to enable the Owner's representative and engineer of record to determine the adequacy of the proposed units for the intended purpose. Deviations from the primary construction documents shall be clouded. The precast concrete units shall be produced in accordance with the approved drawings.

3. Precast Concrete Unit Data
 - a. The precast concrete producer shall supply data sheets showing conformance to project drawings and requirements and to applicable industry design standards listed in this specification. The precast concrete producer shall provide sufficient information as to demonstrate that such products will perform the intended task.
4. Anchorage, Lifting Inserts and Devices
 - a. For anchors, lifting inserts and other devices, the precast concrete producer shall provide product data sheets and proper installation instructions upon request. The precast concrete unit dimensions and safe working load shall be clearly indicated.
 - b. Steel anchors exposed to long term weather shall be protected by hot dip galvanization.
5. Accessory Items
 - a. For items including, but not limited to sealants, gaskets, pipe entry connectors, steps, racks and other items installed before or after delivery, the precast concrete producer shall include proper installation instructions and relevant product data upon request.

B. Design Data

1. Upon request, the precast concrete producer shall supply precast concrete unit design calculations and concrete mix design proportions and appropriate mix design test data. Structural design calculations shall be signed by a licensed professional engineer.

C. Test Reports

2. Upon request, the precast concrete producer shall supply copies of material certifications and/or laboratory test reports, including mill tests and all other test data, for portland cement, blended cement, pozzolans, ground granulated blast-furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on this project.
3. Upon request, the precast concrete producer shall submit copies of test reports showing that the mix has been successfully tested to produce concrete with the properties specified and will be suitable for the project conditions. Such tests may include compressive strength, flexural strength, plastic or hardened air content, freeze-thaw durability, abrasion and absorption.
4. Upon request, the precast concrete producer will supply copies of in-plant QA/QC inspection reports.

D. Certificates

1. Submit quality control procedures established in accordance with NPCA Quality Control Manual for Precast Concrete Plants or verification of current NPCA Plant Certification.

1.04 DESIGN

A. Precast Concrete Unit Design

1. Design standard precast concrete units to withstand indicated design load conditions in accordance with applicable industry design standards ACI 318, ACI 350, ACPA Design Manual, PCI MNL-120, and AASHTO. Design must also consider stresses induced during handling, shipping and installation in order to avoid product cracking or other handling damage. Design loads for precast concrete units shall be indicated on the shop drawings. All calculations shall be prepared by a registered engineer.
2. Minimum design loading for soil: As defined by the geotechnical report, but not less than 100 psf / foot depth, with 2'-0" soil surcharge.

B. Joints and Sealants

1. Joints and sealants between adjacent units shall be of the type and configuration indicated on shop drawings meeting specified design and performance requirements.

C. Durability and performance requirements

1. Concrete Compressive Strength-
 - a. Precast concrete units shall have a minimum 28-day compressive strength ($f'c$) of 4,000 psi, except where otherwise noted on the approved drawings.

D. Water-Cement Ratio

1. Concrete that will be exposed to weather shall contain entrained air and shall have water-cement ratios of 0.40 or less.
2. Concrete which is required to be watertight, shall have a water-cement ratio of 0.40 or less.
3. For corrosion protection, reinforced concrete exposed to deicer salts, brackish water or seawater shall have a water-cement ratio of 0.40 or less.
4. All other concrete shall have a water-cement ratio of 0.45 or less

E. Air Content

1. The air content of concrete that will be exposed to weather conditions shall be 6% +/- 1%.

1.05 QUALITY ASSURANCE

- A. Precast concrete producer shall demonstrate adherence to the standards set forth in the NPCA Quality Control Manual for Precast Concrete Plants.
- B. The precast concrete producer shall be certified by the NPCA Plant Certification Program prior to and during production of the products for this

project.

1.06 HANDLING, STORAGE AND DELIVERY

- A. Handling: Precast concrete units shall be handled and transported in a manner to minimize damage. Lifting devices or holes shall be consistent with industry standards. Lifting shall be accomplished with methods or devices intended for this purpose as indicated on shop drawings.
- B. Storage- precast concrete units shall be stored in a manner that will minimize potential damage.
- C. Delivery: Precast concrete units shall be delivered to the site in accordance with the delivery schedule to avoid excessive build-up of units in storage at the site. Upon delivery to the jobsite all precast concrete units shall be inspected by the customer or customer's agent for quality and final acceptance.
- D. Acceptable crack dimensions: In addition to the criteria specified under ASTM 1433, the maximum crack length under service conditions is 1/64" wide x 2" long. Precast members with cracks wider and longer are subject to rejection and re-casting at pre-caster's expense.

PART 2 - PRODUCTS

2.01 ELECTRICAL PULL BOXES

- A. See also Electrical Specifications
- B. Design Loads: Design loads shall consist of live load, dead load, impact load, hydrostatic load, and other loads that may occur unless otherwise indicated on the drawings. Live loads shall be for H-20 per AASHTO Standard Specifications for Highway Bridges-latest edition.
- C. Floors: Unless otherwise indicated, pre-cast vaults shall have open floor with 1/2-inch gravel bottom.

2.02 SAND/OIL SEPARATOR

- A. Sand-Oil Separator shall be installed at locations as shown on the plans.
 - 1. Jensen 500 Gallon Sand-Oil Interceptor, Model JP500EE-SO or approved equal.
 - 2. Jensen 1000 Gallon Sand-Oil Interceptor, Model JP1000EPE-SO or approved equal.
 - 3. Jensen 5000 Gallon Sand-Oil Interceptor, Model JZ5000EPE-SO or approved equal.
- B. Sand-Oil separator shall be H20 traffic load rated at a bury depth of 1'-6" or deeper.
- C. Shall have cast iron frames and covers with grade rings as required to meet

grades shown.

D. Grade rings shall be sealed with gas-tight gaskets.

2.03 STORM DRAIN INLETS

- A. Storm drain inlets shall be sized as indicated on the plans. The following are acceptable manufactures:
1. Oldcastle Precast
 2. Jensen Precast
 3. Or approved equal
- B. Design Loads: Design loads shall consist of live load, dead load, impact load, hydrostatic load, and other loads that may occur unless otherwise indicated on the drawings. Live loads shall be for H-20 per AASHTO Standard Specifications for Highway Bridges-latest edition.
- C. Grate: Cast Iron slotted grate
- D. Floors: Unless otherwise indicated on the drawings, pre-cast vaults shall have concrete floor.
- E. Preformed Joint Sealant: The joint sealing compound shall be Quik-Seal, a preformed, cold applied, ready to use plastic joint sealing compound as supplied by Quikset Utility Vaults, Santa Ana, California; Ram-Neck by K.T. Snyder Company; or approved equal.

PART 3 - EXECUTION

3.01 PRE-CAST VAULTS

- A. Pre-cast vaults shall be installed in accordance with the manufacturer's recommendations, unless otherwise required by the drawings. All joints shall be sealed by the use of preformed sealant and mortar or non-shrink grout so as to be water tight.

3.02 CONNECTIONS

- A. Connections to manufactured, pre-cast items shall be made by casting sections of pipe into the items, using non-shrink grout as shown on the drawings, and/or using an approved resilient connector. All such connections shall be water-tight.

3.03 SOIL BACKFILL

- A. Engineered soil backfilling operations next to precast concrete structures shall follow the same requirements as cast-in-place structures. Backfill soils shall be placed in lifts where the highest lift on one side of the structure is not more than 1'-0" higher than the lowest lift.

END OF SECTION

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SECTION 03450

PRECAST WALL SYSTEM

PART 1 – GENERAL

1.01 SUMMARY

- A. This section specifies requirements for precast concrete screening walls, perimeter fenceings and noise walls and installation instructions as required for complete, high quality and long lasting walls and including the following.
1. Design of foundation, columns, and panels.
 2. Furnishing and installing new fencing and initial mock-up section of fence.

1.02 QUALITY ASSURANCE

- A. INSTALLER QUALIFICATIONS: engage an experienced installer who has experience with architectural precast concrete screening wall or noise barrier projects with similar material and of similar scope to that indicated for this project with a successful construction record of in-service performance. Installer must submit names, location, and phone number of three references as well as description of the project successfully completed for each reference.
1. Installer shall be registered and/or licensed and approved by authorities having jurisdiction.
- B. SINGLE SOURCE RESPONSIBILITY:
1. Obtain concrete fence materials manufactured in the united states from a single source.
 2. MANUFACTURER QUALIFICATION: engage a firm experienced in producing precast concrete screening wall or noise barrier units in accordance with those indicated for the project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units without delaying the work.
 3. Manufacturer shall be registered and approved by authorities having jurisdiction.

1.03 SUBMITTALS

- A. GENERAL: Submit the following according to the conditions of the project and division specification sections.
1. Product data: furnish manufacturer's literature for each architectural precast concrete screening wall or noise barrier.
 2. Color chart: show full range of available base and accent colors.
 3. Shop drawings: provide working drawings indicating all information necessary for precasting screening wall or noise barrier elements. Drawings shall illustrate the shape and dimension of precast components; the size, quantity and details of the reinforcing steel; the quantity, type,

size and details of connection and lifting hardware.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Verti-Crete of Northern Nevada, Fernley, NV, ph: 888-375-4442
- B. Or Equal

2.02 MATERIALS

A. WALL SYSTEM (PANELS AND COLUMNS)

1. 8' high
2. Panels shall have a molded stone or masonry pattern on both sides. Anticipated pattern is "Ledgestone", Final pattern to be chosen by the District during construction.
3. Columns shall have a smooth face on all four sides.
4. Panels shall be monolithic up to 8' tall. For wall sections greater than 8' tall two panel sections may be stacked on top of each other such that the wall has only one seam between them.
5. Columns shall be monolithic.
6. Columns shall have a concrete cap.
7. Panels, columns and caps shall be constructed from normal weight concrete having sand and gravel or crushed stone aggregates mixed with ASTM-C150, Type I or Type III Portland cement and shall have a minimum compression strength of 4,000 psi @ 28 days.
8. Color: concrete shall be colored after installation with a water-based 100% acrylic concrete stain fortified with silicone. All concrete surfaces shall be stained with H&C® concrete stain solid color water-based (Sherwin-Williams product number 163-2702).
9. Column footings: Depth and width and steel reinforcing as per manufacturer's design/drawings in accordance with local building code requirements. Footings may be closer and panels cut to accommodate changes in direction to fit property lines and/or project requirements.
10. Panel reinforcing: minimum bar size #4. Reinforcing as per approved manufacturers design/drawings in accordance with local building code requirements.
11. Column reinforcing: reinforcing as per manufacturers design/ drawings in accordance with local building code requirements.
12. Footing/column connection: each column shall be installed on top of a pier footing. The connection between the column and the footing will be made by embedding two 6' long #4 rebars (minimum) 3' down into the center of each footings. 3' should be imbedded into footing leaving 3' exposed to then protrude through the center of each column (each column shall be cast with a hollow center). To secure the connection, the hollow core of each column shall be filled high enough to cover the rebar (approximately half way to the top)

13. Loading: wind loading and surcharge loads, will be applied to the panels, columns and foundations components per local building code requirements.

B. Component dimensions

1. Columns shall have typical dimensions of approximately 20" x 20" square with 3" minimum depth notch to receive the tapered ends of each panel. Each column shall have a hollow center.
2. Panels shall have a typical dimension of 12' long by 8' tall, Thickness shall be per manufacturers design, min 4".
3. Caps shall have a typical dimension of 22" x 22"
4. Columns shall be installed on top of pier footings previously poured in place as per manufacturers drawings. Column shall be secured by a rebar anchor embedded into the footing that protrudes through the through the hollow center of the column. After a section of fence is installed each column shall be filled with concrete to a minimum level 6" above the height of the rebar anchor.
5. Panel/column connection shall be tongue and groove construction.

C. Texture

1. General: the wall shall have a molded stone texture on both sides of each wall panel and on all four sides of each column.

D. Color

1. The panels and columns shall be coated with an anti-graffiti coating.
 - a. Acceptable Manufacturer: Sherwin Williams, Contractor shall verify compatibility with intended stain system.
 - b. Siloxane based coating.
 - c. Designed to repel paint, spray paint and permanent marker.
 - d. Requires only pressure washing or hand cleaning to remove graffiti, no solvents or abrasives required.
 - e. Single coat application.
2. Fence shall be colored after installation with a water-based 100% acrylic concrete stain fortified with silicone. All concrete surfaces shall be stained with H&C[®] concrete stain solid color water-based (Sherwin-Williams product number 163-2702). Or approved equal.
3. When coloring the fence after installation is not possible (i.e. Because of weather, interference with traffic, accessibility or concern from overspray onto adjacent structures or property), the concrete elements may be pre-stained by coloring them in the manufacturer's facility. The fence should then be touched up after installation to ensure a consistent, natural looking and complete finish.
4. Base color should be applied with an airless sprayer; accent colors should be applied with sponges
5. Colors selected from manufacturer's color chart.

E. Column footings

1. 13' 2" on center (maximum)
2. Diameter: Per manufacturers design
3. Depth: Per manufacturers design in accordance with local building code requirements.
4. Reinforcing: reinforcing (if required) as per approved manufacturer's drawings in accordance with local building code requirements.
5. Concrete shall be normal weight concrete having sand and gravel or crushed stone aggregates mixed with ASTM-C150, Type I or Type III Portland cement and shall have a minimum compression strength of 3,000 psi @ 28 days.

2.03 GENERAL

A. Load criteria: based on the following minimum soil properties and local codes

1. Soil type: sandy silty clay
2. Soil compaction: 95% standard proctor
3. Minimum soil lateral bearing allowable: 150 psf/ft of depth below grade
4. Minimum soil bearing pressure allowable: 2,000 psf
5. Design wind speed 90-120 mph (depending on local building requirements)

2.04 CONCRETE

A. Concrete material

1. Concrete shall be normal weight concrete having sand and gravel or crushed stone aggregates mixed with ASTM-C150, Type I or Type III Portland cement and shall have a minimum compression strength as follows:
 - a. Panels/columns/caps: 4,000 psi @ 28 days
 - b. Footings: 3,000 psi @ 28 days
 - c. Column centers 3,000 psi @ 28 days
2. Water used for concrete shall be clean water and free from injurious amounts of oils, alkalis, organic or other deleterious substances.
3. All concrete for panels, columns or footings shall contain an air-entraining admixture resulting in 5% (+/- 1%) entrained air or as per local building code requirements.

B. Reinforcing materials:

1. Reinforcing materials may consist of steel, polypropylene fiber or a combination of both.
2. All reinforcing steel shall be deformed type bars or welded wire mesh. All deformed type bars shall conform to ASTM – A615, grade 60, placed as show on approved drawings. All welded wire mesh shall conform to ASTM – A185, grade 60, placed as shown on approved drawings (if required).
3. All reinforcing polypropylene fibers shall be monofilament, at least 2

inches in length and have a tensile strength between 83-96 ksi. (570-660 mpa). Reinforcing polypropylene fibers shall conform to ASTM C1116 Standards for Fiber Reinforced Concrete.

4. All ties and stirrups shall conform to the requirements of ASTM – A615, grade 60.

PART 3 – INSTALLATION

A. General: installation shall be as per manufacturer’s recommendations.

1. Utility lines. Contact local “utility locator” to have all underground facilities marked before installation begins.
2. Grade. The ground should be prepared to a grade 4” below the final grade. This allows for a 3” tall footing form to square off top of footing and then 1” of backfill to cover bottom of wall for final grade or mow strip.
3. Soil. Excavation for footings to undisturbed soil should be minimum 2’ in diameter by a depth of 3’ for 6’ high wall and 4’ for 8’ high wall or as per local building code requirements. Leave bottom-bearing surface clean and smooth. If footing excavations are made deeper than intended, only concrete shall be used for fill.
4. Reinforcing. Reinforcing steel for footings should be installed as per manufacturer’s drawings with the minimum clearance of 3” from all sides
5. Form footings. The top of each footing should be formed to a square and level surface 2’ x 2’ with the square pad having a minimum thickness of 3”.
6. Footing elevations. Wall panels will span from footing to footing and should rest on two level points. When the relative heights of the top of two adjacent footings differ, the downhill side of the uphill footing should be notched out to allow the panel to rest on two level surfaces. This notch may be formed as part of the footing form or may be created by removing a portion of the concrete footing with a square nose shovel while the concrete is still green. Alternately, the bottom corner of the panel may be cut to allow the panel to rest level. Notch should be no more than 8” long by 8” wide by 12” deep.
7. Rebar anchors. Footings should have rebar anchors cast into each center as per manufacturer’s drawings.
8. Level. Panels and columns should be plumb and level. Plastic or other non-organic shims may be used where necessary to ensure that each panel and post is square and level.
9. Fill posts. Columns should be filled with concrete to a minimum height 6” above the top of the rebar anchor. If a gate or any other structure will be mounted to a column, the column should be filled to the top. Columns should not be left unattended or without bracing until filled with concrete (with or without panels installed).
10. Set caps. Caps should be set on top of each column after column is filled with concrete. Cap may be set with masonry adhesive or a standard masonry grout. If masonry adhesive is used the seam should be caulked between the column and the cap to ensure a solid cosmetic seal.
11. Stain. Wall shall be colored with a water-based 100% acrylic concrete

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PRECAST WALL SYSTEM

stain fortified with silicone. All concrete surfaces shall be stained with H&C® concrete stain solid color water-based (Sherwin-Williams product number 163-2702). Base color should be applied in two coats using an airless spray gun. Accent colors may be applied after base color dries using a sponge, brush or roller. Before staining, concrete surface should be clean and free from any dirt or debris.

12. Apply anti-graffiti coating per manufactures recommendation.

END OF SECTION

SECTION 03600

GROUT

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Grouting of column, expansion joints and baseplates.
2. Grouting of anchors and dowels into existing concrete.
3. Patching cavities in concrete.
4. Other grouting specified or indicated on Drawings.
5. This grout is not for use as masonry fill.

B. Related sections:

1. Additional requirements specified elsewhere:
 - a. Submittal: Section 01330
2. Related Work specified elsewhere:
 - a. Cast-In-Place Concrete: Section 03001
 - b. Precast Concrete: Section 03400
 - c. Anchor Bolts and Expansion Anchors: Section 05501

1.02 REFERENCES

A. References standards:

1. Corps of Engineers Specifications CRD-C-621: Specification for Non-Shrink Grout.
2. ASTM C-827: Hardened Volume Change.
3. ASTM C-307: Tensile Strength.
4. ASTM C-579: Compressive Strength.
5. ASTM C-882: Bond Strength.
6. ASTM C33: Concrete Aggregates.
7. ASTM C109: Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2-inch or 50mm cube specimens).
8. ASTM C143: Test Method for Slump of Portland Cement Concrete.
9. ASTM C150: Portland Cement.
10. ASTM C172: Method of Sampling Freshly Mixed Concrete.
11. ASTM C231: Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
12. ASTM C260: Air-Entraining Admixtures for Concrete.
13. ASTM C494: Specification for Chemical Admixtures for Concrete.
14. ASTM C595: Blended Hydraulic Cements.

15. ASTM C827: Test Method for Early Volume Change of Cementitious Mixtures.
16. ACI 211.1: Standard Practice for Selecting Proportions for Normal and Heavyweight, and Mass Concrete.
17. ACI 301: Specifications for structural concrete.

1.03 SUBMITTALS

A. Product Data:

1. Copies of manufacturer's specifications and installation instructions for all proprietary materials.
2. Certification that materials meet specification requirements.
3. For ordinary cement grout, submit copies of grout design mix and laboratory test reports for grout strength tests.

B. Quality control submittals:

1. Test reports: Submit proportioning mix design report.

1.04 QUALITY ASSURANCE

- #### **A.**
- Compliance with the requirements specified herein may necessitate modification to the manufacturer's standard material or equipment.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- #### **A.**
- Deliver and store material in manufacturer's original, unopened, undamaged containers.
- #### **B.**
- Store in dry areas protected from moisture and wet weather.
- #### **C.**
- Store away from traffic areas.

1.06 PROJECT/SITE CONDITIONS

- #### **A.**
- Environmental requirements: Refer to Section 02000

PART 2 - PRODUCTS

2.01 MATERIALS

- #### **A.**
- Non-shrinking non-metallic grout: Master Builders "MF-928 Grout;" W. R. Meadows "588 Grout;" U. S. Grout "Five Star Grout, 100 Series;" or equal.
1. Factory pre-mixed requiring only water addition in the field.

- B. Epoxy grout:
 - 1. Adhesive: Master Flow "Ceilcote 648 CP Grout," Minwax, "POR-ROK," Exxon Chem Co., "Escoweld 2505," Sika "Sikadur Hi-Mod," or equal.
 - 2. Aggregate: Master Flow "Ceilcote 648 CP," Exxon Chem Co., "Escoweld 2510," Sika "Colma Quartzite Aggregate," or equal.
 - 3. Three-component epoxy resin system.
 - a. Two (2) liquid epoxy components.
 - b. One (1) inert aggregate filler component.
 - 4. Each component furnished in separate package for mixing at job site.

- C. Water: Clean and free from deleterious substances.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which grout is to be installed.
- B. Notify the Construction Manager of conditions detrimental to the proper and timely completion of the Work.
- C. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Non-shrinking, non-metallic grout:
 - 1. Clean concrete surface to receive grout.
 - 2. Saturate concrete with water for 24 hours prior to grouting.
 - 3. Place in accordance with manufacturer's instructions.

- B. Epoxy grout:
 - 1. Mix and place in accordance with manufacturer's instructions.
 - 2. Completely fill all cavities and spaces around dowels and anchors without voids.
 - 3. Grout base and baseplates as specified for non-shrinking, non-metallic grout.
 - 4. Obtain manufacturer's field technical assistance as required to insure proper placement.

3.03 APPLICATION

A. Non-shrinking non-metallic grout:

1. Mix in a mechanical mixer.
2. Use no more water than necessary to produce flowable grout.
3. Place in accordance with manufacturer's instructions.
4. Completely fill all spaces and cavities below the top of baseplates.
5. Provide forms where baseplates and bedplates do not confine grout.
6. Where exposed to view, finish grout edges smooth.
7. Except where a slope is indicated on the Drawings, finish edges flush at the baseplate, bedplate, member or piece of equipment.
8. Wet cure grout for seven (7) days minimum.
9. Protect against rapid moisture loss by covering with wet rags or polyethylene sheets.

B. Epoxy grout:

1. Mix and place in accordance with manufacturer's instructions.
2. Completely fill all cavities and spaces around dowels and anchors without voids.

3.04 FIELD QUALITY CONTROL

A. General:

1. Owner will employ a testing laboratory to perform field quality control testing on ordinary cement-sand grout.
2. Engineer will direct the number of tests and cubes required.
3. The testing laboratory will make standard compression test cubes and entrained air tests as specified.
4. Furnish all necessary assistance required by the Engineer.

B. Quality control testing during construction:

1. Sampling and testing for field quality control will be performed by the testing laboratory during the placement of cement-sand grout, as follows:
 - a. Sampling Fresh Grout: ASTM C172.
 - b. Slump: ASTM C143; one (1) test for each grout load at point of discharge from the vender's delivery vehicle; and one (1) for each set of compressive strength specimens.
 - c. Air content: ASTM C231; one (1) for every other grout load at point of discharge from the vender's delivery vehicle, or when required by an indication of change as determined by the Construction Manager.
 - d. Compressive strength tests: ASTM C109; one (1) set of compression cubes for each 50 cubic yards or fraction thereof, of each mix design

placed in any one (1) day or for each 2,500 square feet of surface area placed, whichever provides more cubes. Break one (1) specimen tested at seven (7) days; break two (2) specimens tested at 28 days; and break one (1) specimen tested at the direction of the Construction Manager.

- 1) Adjust mix if test results are unsatisfactory and resubmit for review.
 - 2) Grout that does not meet the strength requirements is subject to rejection and removal from the Work at the expense of the Contractor.
 - 3) The Contractor shall provide all samples required for testing at no additional costs to the Owner.
- e. Compression test specimens:
- 1) ASTM C109; the testing laboratory will take a minimum of one (1) set of four (4) standard cubes for each compressive strength test, unless otherwise directed by the Construction Manager.
- f. Grout temperature: Test hourly when air temperature is 40 degrees F and below, and when 80 degrees F and above; and each time a set of compression test specimens is made. Comply with the requirements of Section 03001 for Cold and Hot Weather Placement.
- g. Shrinkage: ASTM C827.
2. The testing laboratory will submit certified copies of test results directly to the Engineer, who will forward copies to the Contractor.

C. Evaluation of quality control tests:

1. Do not use grout delivered to the final point of placement that has slump, temperature, or total air content outside the specified values.
2. Compressive strength tests for laboratory-cured cubes will be considered satisfactory if the averages of all sets of three (3) consecutive compressive strength test results equal or exceed the 28-day design compressive strength of the type of grout.
3. If the compressive strength tests fail to meet the minimum requirements specified, the grout represented by such tests will be considered deficient in strength and subject to removal, replacement, reconstruction, or to other action required, all at no additional cost to the Owner.

3.05 SCHEDULES

- A. Non-shrinking, non-metallic grout: general use, pipe entrance to precast vaults, pipe supports, etc., unless noted otherwise.
- B. Epoxy grout:
1. Patching cavities in concrete.
 2. Grouting of dowels and anchor bolts into existing concrete.
 3. Other uses indicated on Drawings.

END OF SECTION

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SECTION 04220

CONCRETE UNIT MASONRY

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes: Split faced concrete unit masonry, mortar, grout, water repellent additives and accessories.
- B. Related sections:
 - 1. Related Work specified elsewhere:
 - a. Cast-In-Place Concrete: Section 03301
 - b. Grout: Section 03600
 - c. Anchor Bolts and Expansion Anchors: Section 05501
 - d. Masonry Liquid Water Repellent: Section 07176
 - e. Sealants and Caulking: Section 07900
 - f. Painting: Section 09905

1.02 REFERENCES

- A. Reference standards:
 - 1. ACI 530: Building Code Requirements for Masonry Structures.
 - 2. ACI 530.1: Specification for Masonry Structures.
 - 3. ASTM C90: Hollow Load Bearing Concrete Masonry Units.
 - 4. ASTM C144: Aggregate for Masonry Mortar.
 - 5. ASTM C150: Portland Cement.
 - 6. ASTM C207: Hydrated Lime for Masonry Purposes.
 - 7. ASTM C5: Quick Lime for Structural Purposes.
 - 8. ASTM C270: Mortar for Unit Masonry.
 - 9. ASTM C91: Masonry Cement.
 - 10. ASTM C33: Concrete Aggregates.
 - 11. ASTM C331: Lightweight Aggregates for Concrete Masonry Units.
 - 12. ASTM E514: Standard Test method for Water Penetration and Leakage through Masonry.

1.03 SUBMITTALS

- A. Shop Drawings and Product Data:
 - 1. Manufacturers data on all accessories, including dimensional data.
 - 2. Test data for masonry units.
 - 3. Certification from manufacturer that masonry units meet or exceed the requirements of this section.
 - 4. Submit three block samples, 3" x 3" minimum, for color and texture.
 - 5. Water repellent admixtures
 - a. Mortar admixture
 - 6. Mix designs

B. Qualified Producer Certificate:

1. Provide certificate from integral water-repellent admixture Manufacturer, indicating that masonry producer is qualified to produce concrete masonry units using the manufacturer's admixture and meeting the specified water permeance.

1.04 QUALITY ASSURANCE

A. Requirements of regulatory agencies:

1. All masonry work shall conform to the requirements of the current edition of the California Building Code, ACI 530 and ACI 530.1.

B. Compliance with the requirements specified herein may necessitate modification to the manufacturers' standard equipment.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packing and handling:

1. Handle masonry units to prevent soiling, chipping, or damage of any kind.
2. Do not use discolored, chipped, or otherwise damaged facing units.
3. Replace damaged units with undamaged units.

B. Storage and protection:

1. Store masonry units on pallets and protect from contamination and staining.
2. Keep masonry units covered at all times.
3. Store lime and cement under cover in a dry place.
4. Store sand to prevent inclusion of foreign materials.
5. Store sand only on smooth, well-drained ground, free from dust, mud, and debris.
6. Do not use bottom 6 inches of pile in mortar.

1.06 PROJECT/SITE CONDITIONS

- A. Environmental requirements: See Specification Section 02000
- B. Cold weather conditions: Implement Cold Weather procedures per ACI 530.1, 1.8, C.
- C. Hot weather conditions: Implement Hot Weather procedures per ACI 530.1, 1.8, D.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Hollow load-bearing units:

1. ASTM, Grade N, lightweight.
2. Split face.

3. Nominal face dimensions: 8 inches by 16 inches.
 4. Color: Per District Representative.
 5. Water Permeance: Class E per ASTM E514 with test extended to 72 hours.
 6. Integral waterproofing: Grace Dry-Block liquid polymeric admixture or equal, per manufacturers written instructions.
- B. Mortar and grout:
1. Mortar: ASTM C270 M.
 - a. Maximum air content: 12 percent.
 - b. Average compressive strength: 2,500 psi at 28 days.
 2. Grout:
 - a. Minimum compressive strength: 2,000 psi at 28 days.
 3. Materials:
 - a. Sand: ASTM C144.
 - b. Pea gravel: ASTM C33, coarse aggregate, 90 percent passing a 3/8-inch sieve, 90 percent retained on a No. 4 sieve.
 - c. Portland Cement: ASTM C150, Type I.
 - d. Hydrated lime: ASTM C207, Type S.
 - e. Quicklime: ASTM C5.
 - f. Lime putty: Quicklime.
 - g. Integral waterproofing: aluminum stearate, ammonium stearate or calcium stearate, 2 percent weight of cement; Grace "Hydratite," Master Builders "Omicron Mortarproofing," Sika "No. 1 Integral for Mortar," Sonneborn "Hydracide," or equal.
 - h. Water: Clean and free of deleterious substances.

2.02 ACCESSORIES

- A. Reinforcing steel: ASTM A615, Grade 60.
- B. Expansion gaskets and expansion and control joint material: PVC foam with pressure sensitive back; Graces "Rodo Foam 300," Williams "Dynoseal," Duro-Wall Control Joint, Greenstreak Masonry Control Joint, or equal.

2.03 MIXES

- A. Mortar:
 1. Machine mix for at least five (5) minutes.
 2. Use within 90 minutes.
 3. Discard mortar left on hand when work is stopped or older than 90 minutes.
 4. Do not remix mortar more than 90 minutes old.
 5. Measure proportions accurately to insure definite and accurate proportions.
 6. Volumetric proportions:
 - a. Portland Cement: 1 part.
 - b. Lime or lime putty: Not more than 1/10 part.

- c. Aggregate: Not less than 2-1/4 and not more than three (3) times the sum of the volumes of the cement and lime used.
 - d. Integral waterproofing: 2 percent by weight of Portland Cement quantity.
 - 7. Lime putty: Thoroughly slaked and stored for one (1) day; kept moist until used.
- B. Coarse grout:
 - 1. Volumetric proportions:
 - a. Portland Cement: 1 part.
 - b. Sand: 2-1/2 parts.
 - c. Pea gravel: 1 part.
 - d. Lime or lime putty: Not more than 1/10 part.
 - 2. Add only enough water for workability, but not showing excess water when placed.
- C. Fine grout:
 - 1. Volumetric proportions:
 - a. Portland Cement: 1 part.
 - b. Sand: 2-1/2 parts.
 - c. Lime or lime putty: not more than 1/10 part.
 - 2. Add only enough water for workability, but not showing excess water when placed.
- D. Add "Sika Grout Aid" admixture to grout at the rate of one (1) pound per 100 pounds of cementitious material.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Mortar joint, nominal thickness: 3/8-inch.
 - 1. Lay masonry in straight, level, uniform courses with uniform width mortar joints.
 - 2. Head joints to be approximately the same width as horizontal joints.
 - 3. Place additional mortar in the upper part of the end joints and exert sufficient pressure to force it out the full depth of the joint.
 - 4. Completely and solidly cement together with mortar abutting surfaces of end joints.
 - 5. Lay masonry units in a full bed of mortar.
 - 6. Fill masonry joint so that the space between units is full and the body of the mortar is forced against and into the porous surface of each unit.
 - 7. Joint tooling:
 - a. Regulated so the mortar for each wall space has a uniform appearance.
 - b. Interior: Tooled for a smooth, uniform, concave, rounded surface free of voids.
 - c. Joints to be caulked: Raked to depth of 1/2-inch.

B. Laying masonry units:

1. Lay all concrete block in running bond.
2. Lay only units which are free from dust, dirt, and surface moisture.
3. Lay masonry to a line.
4. Lay walls plumb and straight and in level courses.
5. Do not lay masonry to more than eight (8) feet above adjacent work.
6. When work is suspended, cover tops of masonry walls and protect from weather.
7. Take care at corners and jambs to maintain uniform appearance and use only whole, undamaged units.
8. Use special units at door jambs, window and louver jambs and sills, and at external corners.
9. Vertical alignment:
 - a. Plumb carefully so vertical joints form uniform continuous vertical lines uniform in width, texture, and appearance.
 - b. Use units of uniform length, trimmed as necessary.
 - c. Do not use short closure pieces.
10. Openings and embedments:
 - a. Cut or clip masonry units as required.
 - b. Securely embed anchors in mortar.
 - c. Maintain door and window frames plumb and true.
 - d. Build masonry tightly against interior door and window frames and masonry as indicated on Drawings.
 - e. Provide a caulking space between exterior door and window frames and masonry as indicated on Drawings.
 - f. Completely fill with mortar the jambs of built-in hollow metal door frames.
 - g. Set and anchor embedded items as indicated on the Drawings or in a manner acceptable to Engineer.
 - h. Point joints between masonry and embedded items.
11. Select and lay masonry units so the exposed face of each unit is free from broken corners, chipped edges, or other defects detrimental to the appearance of the wall surface.

C. Bonding and reinforcing:

1. As indicated on Drawings.
2. Anchor masonry walls abutting concrete construction by anchor slots cast in concrete and dovetail anchors at 16-inch maximum vertical spacing.
 - a. Except as indicated on Drawings, dovetail anchor length: 16 inches minimum.
 - b. Secure anchor slots to concrete forms with double headed nails at 12-inch maximum centers.
3. Provide concrete block bond beam units with reinforcing steel where required and as indicated on Drawings.
 - a. Fill units with grout.
 - b. Reinforcing steel continuous around corners.

- c. Reinforcing steel laps 47 bar diameter minimum.
- D. Grouting reinforced hollow unit masonry:
1. Use fine grout except in filled celled construction four (4) inches or more in both horizontal dimensions where coarse grout may be used.
 2. Low-lift grouted construction.
 - a. Do not lay units higher than eight (8) feet before grouting.
 - b. Use cleanouts if height exceeds four (4) feet.
 - c. Do not cut mortar above into grout.
 - d. If grouting is stopped for more than one (1) hour, form a horizontal construction joint by stopping the pour 1/2-inch below the top of the uppermost unit grouted.
 - e. Fully embed horizontal steel in uninterrupted pour.
 3. High-lift grouted construction:
 - a. Lay units to full height of wall.
 - b. Place grout in 4-foot maximum lifts.
 - c. Provide cleanouts at bottoms of all filled cells. Remove all debris and overhanging mortar from walls of cell before grouting.
 - d. Hold vertical reinforcement at top and bottom and at intervals not exceeding 192 bar diameter.
 - e. Consolidate grout after pouring by puddling or vibrating.
 - f. Do not high-lift grout cells with any cell dimension less than 3 inches.
 - g. If grouting is stopped for more than one (1) hour, form a horizontal construction joint by stopping the pour 1/2-inch below the top of the uppermost unit.
 - h. Fully embed horizontal steel uninterrupted pour.
- E. Flashings:
1. Provide as indicated on Drawings and to provide a watertight structure.
 2. Install flashings in horizontal joints at the center of the joints with mortar above and below.
 3. Install flashing to drain to the exterior face of the wall.
 4. Install weeps for all flashing at 16 inches maximum center.
 - a. Wicks installed as masonry is laid, cut flush with block.
 - b. Cast off flush after mortar has set.
 5. Do not allow flashing to contact steel work.
- F. Expansion joints:
1. Provide as indicated on Drawings.
 2. Filler strip minimum dimensions:
 - a. Width: 4 inches.
 - b. Thickness: 1-1/2 times nominal joint width, or as indicated on Drawings.
 3. Firmly bond filler strips to one (1) joint face with adhesive backing.
 4. Hold back filler strips 1/2-inch for caulking.
 5. Place filler strips under compression by construction of abutting masonry.
 6. Unless otherwise indicated on the Drawings, provide construction joints at

a maximum spacing of 24 feet.

7. Shear bar grease: No-Ox-Id "A Special," axle grease, or equal.

G. Anchors and inserts:

1. Accurately set and hold securely in masonry work as indicated on the Drawings all necessary ties, anchors, bolts, inserts, bucks, flashings, sleeves for piping, conduits of every kind, window and door frames, and other work.
2. Provide sleeves where small piping passes through masonry.

H. Finish pointing:

1. Point exposed masonry at the completion of work as necessary.
2. Fill voids and holes in mortar to match adjacent joint surfaces.
3. Cast out defective joints and repoint with mortar.
4. Take care to produce a uniform overall appearance.
5. Spottiness due to variations in materials or workmanship is not acceptable.

3.02 CLEANING

- A. After finish pointing, carefully clean all exposed masonry surfaces and remove all surface stains.
- B. Remove mortar smears or droppings from concrete block with steel trowel:
 1. Do not attempt to remove until smears or droppings have hardened sufficiently to prevent further smearing.
 2. Remove remaining mortar by rubbing with a small piece of block.
 3. Thoroughly brush all surfaces.

3.03 PROTECTION

- A. Protect masonry and embedded items from damage until completion of work.
- B. Rebuild all damaged walls with new materials.
- C. When placing concrete adjacent to masonry, protect masonry from splashing of concrete paste and other damage.
- D. When placing concrete on top of masonry, protect masonry from splashing, spilling, and water penetration with protective covering on top of masonry and extended down each side of wall as required for adequate protection.
- E. Neatly trim protective covering at wall face after form removal.

END OF SECTION

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SECTION 05501
ANCHOR BOLTS AND EXPANSION ANCHORS

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Equipment anchor bolts.
2. Structural anchor bolts.
3. Expansion anchors.
4. Epoxy set anchor bolts.

B. Related sections:

1. Additional requirements specified elsewhere:
 - a. Shop Drawings and Product Data: Section 01330
 - b. Material and Equipment: Section 01600
2. Related Work specified elsewhere:
 - a. Cast-in-Place Concrete: Section 03001
 - b. Grout: Section 03600
 - c. Miscellaneous Metal: Section 05999

1.02 REFERENCES

A. Reference standards:

1. ASTM A307: Carbon Steel Externally Threaded.
2. ASTM A153: Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
3. ASTM A164: Electrodeposited Coatings of Zinc on Steel.
4. ASTM A120: Pipe, Steel, Black and Hot-Dipped, Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses.
5. ASTM A36: Structural Steel.
6. ASTM A276: Stainless Steel.
7. ANSI B94.12: Epoxy Set Anchors.

1.03 SYSTEM DESCRIPTION

A. Contractor's option:

1. If cast-in anchor bolts are shown, then cast-in anchor bolts shall be used.
2. If epoxy-set anchors are shown, then epoxy-set anchors or cast in anchors may be used.
3. If expansion anchors are shown, the Contractor may use cast-in anchor bolts, epoxy-set anchors or expansion anchors.

1.04 SUBMITTALS

A. Shop Drawings and Product Data:

1. Sufficient to verify compliance with specifications, to include manufacturer's literature on sizes, material and installation procedures.

1.05 QUALITY ASSURANCE

- A. Compliance with the requirements specified herein may necessitate modification to the manufacturer's standard materials or equipment.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver anchor bolts and templates in time to permit setting when structural concrete is placed.

1.07 PROJECT/SITE CONDITIONS

- A. Environmental requirements: Refer to section 02000

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Bolts:
 1. Carbon steel: ASTM A307.
 2. Stainless steel: ASTM 276, Grade 303, 304, 305 or 316.
 3. Galvanized steel: Carbon steel, hot-dip galvanized, ASTM A153; or zinc plated, ASTM A164 type GS.
 4. All bolts, nuts and washers associated with pipe and valve connections shall be coated in TRIPAC 2000 BLUE coating system.
- B. Nuts:
 1. Same material as bolts.
 2. Carbon steel: ASTM A307, Grade B heavy hexagonal.
 3. Stainless Steel: ASTM 276, Grade B heavy hexagonal.
 4. Self-locking: Prevailing torque, IFI-100, grade A.
 5. Use anti-seize compound on stainless steel threads.
- C. Washers:
 1. Same material as bolts.
 2. Flat: ANSI B27.2.
 3. Locking: Spring type ANSI B27.1.
- D. Sleeves:
 1. Pipe: ASTM A120, galvanized.
 2. Bearing Plates: ASTM A36, galvanized.
- E. Expansion anchors: (For use only where approved)
 1. In hardened concrete:
 - a. Wedge type: A-A-1923, Type 4, Class I.
 - b. Self-drilling: A-A-1924, Type I.

- c. Non-drilling, internally threaded: A-A-SS614, Type 1.
- d. Non-drilling, externally threaded: A-A-SS614, Type 2.

F. Epoxy set anchors:

- 1. In hardened concrete and fully grouted masonry:
 - a. Stainless steel studs, nuts and washers.
 - b. Approved manufacturers:
 - 1) Hilti, Inc., HIT RE 500 with HAS rods
 - 2) Or equal.

2.02 FABRICATION

A. Anchor bolts:

- 1. 3/4-inch minimum, except as indicated on the Drawings.
- 2. Type:
 - a. General use: L-shaped hook type.
 - b. Where indicated on Drawings or specified:
 - 1) Straight bolt with square head.
 - 2) Straight bolt with square plate welded to bolt and nut welded to plate and bolt.
 - 3) Through-bolt with sleeve and square plate assembly.
 - 4) Coupled bolt with sleeve welded to square plate and bolt.

B. Expansion anchors:

- 1. 5/8-inch maximum size allowable.
- 2. Do not use cinch anchors.
- 3. Use other anchors for all fasteners greater than 5/8-inch.

C. Epoxy set anchors:

- 1. 3/4-inch minimum.
- 2. Where indicated on Drawings.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that holes for anchor bolts in forms and templates match applicable equipment Shop Drawings.

3.02 INSTALLATION

A. Anchor bolts:

- 1. Where installed in cast-in-place concrete, install a nut on the concrete side of the form or supporting template.
- 2. Provide three (3) nuts for each anchor bolt for which a lock nut is indicated, two (2) for others.
- 3. Sleeved anchor bolts:
 - a. Centered in pipe sleeve.
 - b. Sleeve ID: Approximately 2-1/2 times bolt OD.

- c. Sleeve length: Approximately eight (8) times bolt OD.
 - d. Bearing plate minimum thickness: 1/2 times bolt OD.
 - 4. Through bolts:
 - a. Sleeved with bearing plates.
 - b. Bearing plates welded to bolt and plate welded to sleeve.
 - c. Dimensions: As specified for sleeved anchor bolts.
- B. Expansion anchors:
 - 1. Install in conformity with the manufacturer's instructions.
 - 2. Minimum whole depth: 4-bolt diameter.
 - 3. Minimum distance between expansion anchor centerline and any edge or exterior corner of concrete: 4-1/2 bolt hole diameter
- C. Epoxy set anchors:
 - 1. Install as per manufacturer's recommendation.
 - 2. Clean hole and inspect prior to installation.
 - 3. Minimum hole depth: As per manufacturer's recommendation but not less than 6-5/8 inches.
 - 4. Diameter of drilled holes: As per ANSI B94.12.

3.03 SCHEDULES

- A. Anchorage materials to be as noted on plans.
- B. If materials are not noted on plans, the materials shall be:
 - 1. Submerged: 316 stainless steel.
 - 2. Encased in concrete: Carbon steel.
 - 3. Exposed outdoors: Galvanized

END OF SECTION

SECTION 05505
METAL FABRICATIONS

PART 1 - GENERAL

1.01 DESCRIPTIONS

A. Section Includes:

1. Custom fabricated metal items and certain manufactured units not otherwise indicated to be supplied under work of other sections.

1.02 QUALITY ASSURANCE

A. Referenced Standards:

1. Aluminum Association (AA): SAS-30, Specifications for Aluminum Structures.
2. American Association of State Highway and Transportation Officials (AASHTO): Standard Specifications for Highway Bridges.
3. Americans with Disabilities Act (ADA): Accessibility Guidelines for Buildings and Facilities.
4. American Institute of Steel Construction (AISC): Specifications for Structural Steel Buildings (referred to herein as AISC specification).
5. American National Standards Institute (ANSI):
 - a. A14.3, Ladders-Fixed-Safety Requirements.
 - b. ANSI MBG 531, Metal Bar Grating Manual.
 - c. ANSI MBG 532, Heavy-Duty Metal Bar Grating Manual.
6. American Society for Testing and Materials (ASTM):
 - a. A36, Standard Specification for Structural Steel.
 - b. A47, Standard Specification for Ferritic Malleable Iron Castings.
 - c. A48, Standard Specification for Gray Iron Castings.
 - d. A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - e. A108, Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.
 - f. A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - g. A153, Standard Specifications for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - h. A197, Standard Specification for Cupola Malleable Iron.
 - i. A269, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - j. A276, Standard Specification for Stainless Steel Bars and Shapes.
 - k. A269, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - l. A307, Standard Specification Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

- m. A325, Standard Specification for High-Strength Bolts for Structural Steel Joints.
 - n. A496, Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
 - o. A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - p. A525, Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
 - q. A536, Standard Specification for Ductile Iron Castings.
 - r. A563, Standard Specification for Carbon and Alloy Steel Nuts.
 - s. A582, Standard Specification for Free-Machining Stainless and Heat-Resisting Steel Bars, Hot-Rolled or Cold-Finished.
 - t. A666, Standard Specification for Austenitic Stainless Steel, Sheet, Strip, Plate, and Flat Bar.
 - u. A668, Standard Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use.
 - v. A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings.
 - w. A786, Standard Specification for Rolled Steel Floor Plate.
 - x. B26, Standard Specification for Aluminum-Alloy Sand Castings.
 - y. B36, Standard Specification for Brass Plate, Sheet, Strip, and Rolled Bar.
 - z. B221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
 - aa. B308, Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Shapes.
 - bb. B632, Standard Specification for Aluminum-Alloy Rolled Tread Plate.
 - cc. F467, Standard Specification for Non-Ferrous Nuts for General Use.
 - dd. F468, Standard Specification for Non-Ferrous Bolts, Hex Cap Screws, and Studs for General Use.
 - ee. F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
7. American Welding Society (AWS):
- a. A5.1, Specification for Covered Carbon Steel Arc Welding Electrodes.
 - b. D1.1, Structural Welding Code Steel.
 - c. D1.2, Structural Welding Code Aluminum.
8. National Association of Architectural Metal Manufacturers (NAAMM): AMP 510, Metal Stairs Manual.
9. Research Council on Structural Connections: Specification for Structural Joints Using ASTM A325 or A490 Bolts (referred to herein as Specification for Structural Joints).
10. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA): 29 CFR 1910, OSHA Safety and Health Standards for General Industry (referred to herein as OSHA standards).
11. Provide all fabricated items complying with 2014 California Building Code and OSHA Regulations.

- B. Qualifications: Qualify welding procedures and welder operators in accordance with AWS.

1.03 DEFINITIONS

- A. Installer or Applicator: Installer or applicator is the person actually installing or applying the product in the field at the Project site. Installer and applicator are synonymous.
- B. Hardware: As defined in ASTM A153.
- C. Galvanizing: See specification Section 05910.

1.04 SUBMITTALS

- A. Shop Drawings:
 - 1. Fabrication and/or layout drawings:
 - a. Submit shop drawings for all fabrications and assemblies.
 - 2. Product technical data including:
 - a. Acknowledgement that products submitted meet requirements of standards referenced.
 - b. Manufacturer's installation instructions.
 - c. For grating, include manufacturer's standard allowable load tables.
 - 3. For ladders, provide certification that manufactured units meet all design loads specified per ASCE 7 4.5.4.
- B. Miscellaneous Submittals:
 - 1. Certification of welders and welding process.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
 - 1. Epoxy Adhesive Anchors:
 - a. Hilti Inc., RE 500 with HAS rods
 - b. Or approved equal

2.02 MATERIALS

- A. Steel:
 - 1. Structural steel: ASTM A36.
 - 2. Steel pipe: ASTM A53, Types E or S, Grade B.
 - 3. Structural tubing: ASTM A500, Grade B.
 - 4. Bolts, nuts and washers, high strength: ASTM A325.
 - a. Provide washers with all nuts.
 - 5. Bolts and nuts: Unfinished, ASTM A307, Grade A.
 - a. Provide washers with all nuts.
 - 6. Electrodes for welding steel: AWS A5.1, E70 Series.
 - 7. Steel forgings: ASTM A668.

B. Iron:

1. Ductile iron: ASTM A536.
2. Gray cast iron: ASTM A48.
3. Malleable iron: ASTM A47, A197.

C. Stainless Steel:

1. Stainless steel:
 - a. ASTM A666, Type 316, Grade A.
 - b. Type 304L for welded connections.
2. Stainless steel bolts and nuts: ASTM F593, Type 303 or 304 with minimum yield strength of 30,000 PSI and minimum tensile strength of 70,000 PSI.
3. Stainless steel tubing: ASTM A269.
4. Stainless steel bars, shapes: ASTM A276.

D. Aluminum:

1. Rolled shapes and extrusions: ASTM B308 or B221.
2. Castings: ASTM B26.
3. Alloys 6061-T6 or 6063-T6 unless specified otherwise in this Section.
4. Aluminum angles, beams, pipes, plates and channels: Alloy 6061-T6.
5. Aluminum weir plates and baffles: Alloy 6061-T6.
6. Aluminum bolts: ASTM F468, alloy 2024 T4.
7. Aluminum nuts: ASTM F467, alloy 2024 T4.
8. Electrodes for welding aluminum: AWS D1.2, filler alloy 4043 or 5356.

E. Washers: Same material and alloy as found in accompanying bolts and nuts.

F. Embedded Anchor Bolts:

1. Type A36 Carbon Steel with matching nut and washer.

G. Adhesive Anchors:

1. Install only where approved by Engineer or shown on the drawings.
2. HIT RE 500 adhesive anchor system by Hilti; or approved equal.
3. Anchor rod assembly:
 - a. ASTM F593 Type 304 stainless steel with matching stainless steel nut and washer.
4. Adhesive capsule:
 - a. Vinylester resin adhesive.
 - b. Provide adhesive capsules for anchoring reinforcing where indicated on Drawings. Embedment length shall be adequate to develop the yield strength of the reinforcing bar.
5. Provide edge distance cover as recommended by manufacturer, or as indicated on Drawings.

H. Iron and Steel Hardware: Galvanized in accordance with ASTM A153 when required to be galvanized.

I. Railings:

1. Aluminum:

- a. Mill finish, 1-1/2 inch Schedule 40 pipe.
2. All railings provided of the same type and design, except as otherwise specified or indicated on drawings.
3. Provide railings with no more than a 6-inch gap between rail post and adjacent non-connected posts or other facilities such as columns, gates, walls, etc.
4. Connections:
 - a. Welded railing:
 - 1) Make connection angles, offsets, or other changes in alignment in pipe railings with prefabricated railing cells and welding connectors, R.B. Wagner, Julius Blum or equal.
 - b. Prefabricated aluminum railing: As recommended by railing manufacturer.
5. Fabrication:
 - a. Smooth with all projecting joints and sharp corners ground smooth.
 - b. Make welded joints flush.
 - c. Neatly cope members and continuously weld or connect mechanically at all junctions.
 - d. Dress weld fillets to uniform radius, remove excess metal and grind smooth.
6. Removable guardrail sections to have a minimum of two (2) posts each.
 - a. Sleeves:
 - 1) Fixed posts:
 - a) Standard weight steel pipe.
 - b) 4-inch or larger as required to provide 1-inch minimum grout space around post.
 - 2) Removable posts:
 - a) Outer sleeve: Standard weight black steel pipe.
 - b) Inner sleeve: Schedule 40 PVC pipe.

2.03 FABRICATION

- A. Verify field conditions and dimensions prior to fabrication.
- B. Form materials to shapes indicated with straight lines, true angles, and smooth curves.
 1. Round all corners to 1/8 IN nominal radius.
- C. Drill or punch holes with smooth edges.
- D. Weld Permanent Shop Connections:
 1. Welds to be continuous fillet type unless indicated otherwise.
 2. Full penetration butt weld bends in stair and ladder stringers.
 3. Weld structural steel in accordance with AWS D1.1 using Series E70 electrodes conforming to AWS A5.1.
 4. Weld aluminum in accordance with AWS D1.2.
 5. Grind smooth welds that will be exposed.
- E. Conceal fastenings where practicable.

- F. Punch or drill for field connections and for attachment of work by other trades.
- G. Fabricate work in shop in assemblies as large as is practicable.
- H. Finishes:
 - 1. Aluminum: Mill finished unless scheduled or otherwise specified or, if approved, finished in manufacturer's standard.
 - 2. See Section 09905 for preparation and painting of ferrous metals and other surfaces.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Prior to installation, inspect and verify condition of substrate. Installation of product constitutes installer's acceptance of substrate condition for product compatibility.
- B. Correct surface defects or conditions which may interfere with or prevent a satisfactory installation.
- C. Field welding aluminum is not permitted unless approved in writing by Engineer.

3.02 INSTALLATION

- A. Set metal work level, true to line, plumb. Shim and grout as necessary.
- B. Bolt Field Connections: Where practicable, conceal fastenings.
- C. Grind welds smooth where field welding is required.
- D. Remove all burrs and radius all sharp edges and corners of miscellaneous plates, angles, framing system elements, etc.
- E. Unless noted or specified otherwise:
 - 1. Connect steel members to steel members with minimum 3/4 IN DIA ASTM A325 high strength bolts.
 - 2. Connect aluminum to aluminum with 3/4 IN DIA aluminum bolts.
 - 3. Connect aluminum to structural steel using 3/4 IN DIA stainless steel bolts. Provide dissimilar metals protection.
 - 4. Connect aluminum and steel members to concrete and masonry using 3/4 IN DIA stainless steel bolts unless shown otherwise. Provide dissimilar materials protection.
 - a. Expansion bolts to have a minimum embedment of 4 IN into concrete and masonry unless indicated otherwise on Drawings.
 - b. Coat all aluminum in contact with concrete Per Section 09905, Condition D.
 - 5. Provide washers for all bolted connections.
- F. Install and tighten ASTM A325 high-strength bolts in accordance with latest edition of Manual of Steel Construction. Provide hardened washers for all ASTM A325 bolts. Provide the hardened washer under the element (nut or

- bolt head) turned in tightening.
- G. Secure metal to wood with lag screws of adequate size (5/8" dia. min.) with appropriate washers. If smaller lag screws are required for a particular application, notify Engineer for approval.
 - H. Do not field splice fabricated items unless said items exceed standard shipping length or change of direction requires splicing. Provide full penetration welded splices where continuity is required.
 - I. Provide each fabricated item complete with attachment devices as indicated or required to install.
 - J. Anchor aluminum and metal work so that work will not be distorted nor fasteners overstressed from expansion and contraction.
 - K. Tie anchor bolts in position to embedded reinforcing steel using wire. Tack welding prohibited. Coat bolt threads and nuts with heavy coat of clean grease. Anchor bolt location tolerance: 1/16 IN. Provide steel templates for all column anchor bolts.
 - L. Install bollards in concrete as detailed. Fill pipe with concrete and round off at top.
 - M. Accurately locate and place frames for openings before casting into floor slab so top of plate is flush with surface of finished floor. Keep screw holes clean and ready to receive screws.
 - N. Attach grating to end and intermediate supports with grating saddle clips and bolts.
 - 1. Maximum spacing: 2 FT OC with minimum of two per side.
 - 2. Attach individual units of aluminum grating together with clips or attachments at 2 FT OC maximum with a minimum of two clips per side.
 - O. Prepare and paint ferrous metals in accordance with Section 09905.
 - P. Coat aluminum surfaces in contact with dissimilar materials or concrete in accordance with Section 09905, Condition D.
 - Q. Repair damaged galvanized surfaces in accordance with ASTM A780.

END OF SECTION

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SECTION 05910

HOT-DIP ZINC COATING

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section specifies hot-dip zinc coating. Unless otherwise specified, steel items not fully encased in a building envelope shall be hot-dip zinc coated. Also, termed hot dip galvanized.
- B. References

<u>Reference</u>	<u>Title</u>
ASTM A90	Standard Test Methods for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles
ASTM A123	Zinc Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strip
ASTM A153	Zinc Coating on Iron and Steel Hardware
ASTM A384	Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
ASTM A385	Providing High Quality Zinc Coatings on Assembled Products
ASTM A386	Zinc Coating on Assembled Steel Products
MILSPEC	Paint, High Zinc Dust Content, Galvanizing
DOD-P-21035	Repair

PART 2 – PRODUCTS

2.01 MATERIALS

- A. The coating material shall be as specified in ASTM A153 or ASTM A123.

PART 3 – EXECUTION

3.01 GALVANIZING

- A. The thickness, chemistry, and all other engineering properties of galvanizing shall be defined by ASTM A153 and ASTM A123.

3.02 FIELD REPAIRS

- A. Where zinc coating has been damaged, substrate surface shall be cleaned and repaired with zinc dust-zinc oxide coating in accordance with MILSPEC DOD-P-21035. Field repair of zinc coated surfaces, including Unistrut shall be accomplished with Z.R.C., as manufactured by Z.R.C. Chemical Products Co.; Galvicon as manufactured by Galvicon Co.; or equal.

3.03 POST-GALVANIZING COATING

Section 05910
HOT-DIP ZINC COATING

- A. When paint is required over a hot-dip galvanized coating, the galvanized surface requires special preparation. Chemical or abrasive methods may be used, with care exercised to not remove excessive galvanized coating.
- B. Galvanized surfaces scheduled to be painted shall not have a passivator applied. Any surface scheduled to be painted on which a passivator has been found to be applied shall be abrasive blasted, chemically cleaned or replaced at the Engineers discretion.

END OF SECTION

SECTION 07176

MASONRY LIQUID WATER REPELLANT

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes: Liquid water repellent for all above-grade exterior surfaces of concrete masonry units. Liquid water repellent additive to mortar and grout for CMU walls specified separately in section 04220.
- B. Related sections:
 - 1. Related Work specified elsewhere:
 - a. Cast-In-Place Concrete: Section 03301
 - b. Concrete Unit Masonry: Section 04220
 - c. Painting: Section 09905

1.02 REFERENCES

- A. Reference standards:
 - 1. U.S. Army Corps of Engineers CRD-C-48-73: Permeability of Concrete.
 - 2. ASTM 267: Chemical Resistance of Mortars, Grouts and Monolithic Surfacing.
 - 3. ASTM C672: Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.
 - 4. ASTM E96: Permeability.

1.03 SUBMITTALS

- A. Submit manufacturer's literature, specifications, mock-up sample and application instructions.
- B. Shop Drawings:
 - 1. Product technical data including:
 - a. Manufacturer's application instructions.
 - b. Warranty data.
 - 2. Certificate: Submit manufacturer's Certificate of Conformance.

1.04 QUALITY ASSURANCE

- A. Mock-Up: Product shall be applied to one (1) side of sample masonry unit, 8 inches by 16 inches minimum size.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Delivery:
 - 1. Deliver materials to project site in manufacturer's original bags or containers.
 - 2. Clearly identify manufacturer, contents, brand name, and applicable standard.

B. Storage:

1. Store materials off the ground and under protective covering.
2. Protect against weather, condensation and damage.
3. Follow all manufacturer recommendations for handling and storage.

1.06 PROJECT/SITE CONDITIONS

A. Environmental requirements: See also Specification Section 02000

1. Do not apply when rain is predicated within a period of 24 hours after application.
2. Do not proceed with application of materials when ambient temp is less than 50 degrees F.
3. Do not apply water repellent in rainy, wet, damp or foggy conditions.
4. Do not apply materials when temperature of 40 degrees F or less is predicated within a period of 24 hours after application.

1.07 WARRANTY

A. Provide manufacturer's standard 10-year performance warranty.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Acceptable manufacturers:

1. Subject to compliance with the Contract Documents, the following manufacturers are acceptable.
 - a. Liquid water repellent:
 - 1) ProSoCo: Siloxane PD or Siloxane WB Concentrate.
 - 2) Pecora: Klere-Seal 910-W/920-W.
 - 3) Degussa: Enviroseal Double 7 HD.
 - 4) Sonneborn: Penetrating Sealer 40 VOC
 - 5) Nox-Crete Chemicals, Inc.: Stifel-VC.
 - 6) Or equal.

2.02 MATERIALS

- A. Liquid water repellent: Clean, non-staining, non-yellowing, deep penetrating sealer.
- B. Silane content: 40 percent minimum.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Protect adjacent surfaces not intended to be covered.
- B. Clean surfaces to be covered in accordance with manufacturer's recommendations. Remove all dust, dirt, oil, wax, grease, asphalt, tar, stains, clinging mortar, efflorescence and other foreign materials. Allow three (3) days drying time following washing down of substrate surfaces

- C. Make all mortar repairs at least 72 hours prior to application
- D. Allow masonry surfaces to cure minimum of ten (10) days prior to application.
- E. Environmental requirements:
 - 1. Materials to be applied only when ambient temperature is 50 degrees F or greater.
 - 2. Do not Apply water repellent in rainy, wet, damp or foggy condition.
 - 3. Maintain temperature above 40 degrees F for 24 hours after application.
 - 4. Protect from moisture and rain for minimum of 6 hours after application.

3.02 APPLICATION

- A. Install products in accordance with manufacturer's instructions.
- B. Apply two (2) coats to exterior work minimum.
- C. Apply to exterior brick and concrete block surfaces.
- D. Apply water repellent with low-pressure airless spray coarse nozzle, flooding surface. Do not use aspirator-type spray equipment that atomizes the liquid to fog.
- E. Apply, as a minimum, two (2) coats of water-repellent material, each at a rate of no more than 100 square feet/gallon. Volume of sealant applied to be confirmed with Resident Engineer during course of application work.
- F. Start application at top of wall and work down surface, keeping a wet edge at all times. Utilize scaffolding equipment as necessary to maintain applicator spray nozzle within 15 degrees of horizontal during application.
- G. Avoid letting water repellent dry between passes.

3.03 FIELD QUALITY CONTROL

- A. Manufacturer or manufacturer's designated representative shall conduct a water spray test to an area (or areas) of the wall selected at random for a period of three (3) hours.
 - 1. Water from the spray shall impact the wall at a 45-degree angle to the vertical and shall cover an area of not less than 9 square feet.
 - 2. If, within three (3) hours, water transmission appears on the inside face of the wall within the test area, recoat the wall.
- B. Retest as required.
- C. Recoat as required until wall area remains dry within limits of testing procedure.

3.04 PROTECTION

- A. Protect plants and vegetation from water repellent fumes or alkalinity of the materials.
- B. Positively protect adjacent surfaces of aluminum and glass. Clean any overspray immediately with soap and water solution.

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C. Protect all adjacent painted surfaces.

END OF SECTION

SECTION 07900

SEALANTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included

1. Clean and prepare joint surfaces.
2. Sealant and backing materials.

1.02 REFERENCES

- A. ASTM C834 Specification for Latex Sealing Compounds
- B. ASTM C920 Standard Specifications for Elastomeric Sealers
- C. ASTM D1056 Flexible Cellular Materials - Sponge or Expanded Rubber

1.03 SUBMITTALS

A. Product Data and Samples

1. Submit product data and samples in accordance with Section 01330 – Submittal Procedures.
2. Submit manufacturer's written surface preparation and installation instructions.
3. Submit samples of sealant colors.

1.04 WARRANTY

- A. Provide one-year warranty in accordance with the General Conditions.
- B. Warranty: Replace sealants which fail because of loss of cohesion or adhesion, or do not cure.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed below are approved with regards to their specific products.

2.02 MATERIALS

- A. Two-Part Urethane: ASTM C920, Type M, Self-Leveling, Class 25.
 1. Bostik Construction Products: Chem-Calk 550.
 2. Mameco International: Vulkem 245.
 3. Pecora Corporation: Urexpan NR-200.
 4. Sonneborn Building Products: Isolastic SL-2, Paving joint sealant.
 5. Sika Corporation: Sikaflex 2c SL.
- B. Two-Part Urethane: ASTM C920, Type M, Non-Sag.

1. Bostik Construction Products: Chem-Calk 500.
 2. Mameco International: Vulkem 227.
 3. Pecora Corporation: Dynatrol II.
 4. Sonneborn Building Products: Sonolastic NP-2.
 5. Sika Corporation: Sikaflex 2c NS
- C. One-Part Urethane: ASTM C920, Type S, Non-Sag, Class 25.
1. Bostik Construction Products: Chem-Calk 900.
 2. Mameco International: Vulkem 116.
 3. Pecora Corporation: Dynatrol I-XL.
 4. Schnee and Morehead, Inc: S-M 7100.
 5. Sonneborn Building Products: Sonolastic NP-1.
 6. Sika Corporation: Sikaflex 1a
- D. One-Part Silicone: ASTM C920, Type S, Non-Sag, Class 25.
1. Dow-Corning Corporation: 795.
 2. General Electric Company: SCS 1000.
 3. Pecora Corporation: 895
 4. Sonneborn Building Products: Omniseal 50.
 5. Sika Corporation: Sika Sil C-995.
- E. Latex-Acrylic Sealant: ASTM C834, Non-Sag, Class 25.
1. Pecora Corporation: AC-20.
 2. Schnee and Morehead, Inc.: S-M 8200.
 3. Sonneborn Building Products: Sonolac.
 4. W.R. Meadows, Inc.: Esaply.
- F. Immersed Service Sealant:
1. Sika Corporation: Sikaflex 2c.
 2. Polymeric Systems, Inc.: PSI 270.
 3. Pacific Polymers International: Elasto-Thane 227 R

2.03 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Filler: ASTM D1056; round, closed cell foam rod; oversized 30 to 50 percent; Grey Flex manufactured by Emseal.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify joint dimensions, physical and environmental conditions are acceptable

to receive work of this Section.

B. Beginning of installation means acceptance.

3.02 PREPARATION

- A. Clean, prepare, and size joints in accordance with manufacturer's instructions. Remove any loose materials and other foreign matter which might impair adhesion of sealant.
- B. Verify that joint shaping materials and release tapes are compatible with sealant.
- C. Examine joint dimensions and size materials to achieve required width / depth ratios.
- D. Use joint filler to achieve required joint depths, to allow sealants to perform properly.
- E. Use bond breaker where required.

3.03 INSTALLATION

- A. Perform work in accordance with ASTM C834 for latex compounds and C920 for elastomeric sealants.
- B. Install sealant in accordance with manufacturer's written instructions. Apply primer where recommended by manufacturer.
- C. Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature ranges.
- D. Tool joints as indicated.
- E. Joints: Free of air pockets, foreign embedded matter, ridges, and sags.

END OF SECTION

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SECTION 09905

PAINTING AND PROTECTIVE COATINGS

PART 1 - GENERAL

1.01 SCOPE.

- A. Provide all labor, materials, apparatus, scaffolding, and all apparatus work in connection with painting and protective coatings, complete as indicated, specified and required.
- B. Work Included in This Section. Principal items include:
 - 1. All new and altered exposed piping, conduits, and other metal surfaces, interior and exterior, except stainless steel or as hereinafter specifically excluded.
 - 2. All submerged and intermittently submerged new and altered existing metal surfaces, except stainless steel.
 - 3. All new or altered existing structural and miscellaneous steel.
 - 4. Equipment furnished with and without factory finished surfaces.
 - 5. Equipment, on which factory applied finishes have been marred, abraded, scratched, nicked, or otherwise damaged.
 - 6. Except as hereinafter specifically excluded, repainting of existing interior and exterior painted surfaces from architectural break to architectural break where damaged or altered in performance of work of this General Contract.
 - 7. The Contractor shall furnish to the Owner, at no additional charge for use during this Project, the necessary dry film thickness gages and electrical flaw detection equipment required, and inspection equipment to ensure conformance with all specifications and standards included herein.
- C. Related Work Not Included in This Section. The following surfaces, in general shall not be painted:
 - 1. Concrete surfaces.
 - 2. Plastic surfaces, except as specified for identification purposes.
 - 3. Nonferrous metals and stainless steel unless otherwise noted or indicated. Galvanized metal shall not be considered a nonferrous metal.

1.02 GUARANTEE.

- A. A three (3) year guarantee which commences on the date of acceptance against failure of all coatings shall be provided unless otherwise specified; the longer period of warranty shall prevail. Failure of any coating during the guarantee period shall be repaired by the Contractor who shall absorb all costs related to the repair of the coating, including inspection. The contractor shall provide a three-year warranty bond.

1.03 REFERENCE SPECIFICATIONS AND STANDARDS.

- A. American Society for Testing and Materials (ASTM):

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1. D 4262-83 - Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces.
 2. D 4263-83 - Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 3. D4285-83 - Test Method for Indicating Oil or Water in Compressed Air.
 4. D4541-93 - Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testers.
- B. NACE International, The Corrosion Society (NACE):
1. RPO188-99 - Discontinuity (Holiday) Testing of Protective Coatings.
- C. National Association of Pipe Fabricators (NAPF):
1. NAPF 500-03 - Surface Preparation Standard for Ductile Iron Pipe and Fittings Receiving Special External Coatings and/or Special Internal Linings.
- D. NSF International (NSF):
1. NSF 61 - Drinking Water System Components - Health Effects.
- E. SSPC – Society for Protective Coatings:
1. SSPC SP1 - Solvent Cleaning.
 2. SSPC SP2 - Hand Tool Cleaning.
 3. SSPC SP3 - Power Tool Cleaning.
 4. SSPC SP5 - White Metal Blast Cleaning.
 5. SSPC SP6 - Commercial Blast Cleaning.
 6. SSPC SP7 - Brush-Off Blast Cleaning.
 7. SSPC SP10 - Near-White Blast Cleaning.
 8. SSPC SP 11 - Power Tool Cleaning to Bare Metal.
 9. SSPC-SP 12 - High- and Ultrahigh-Pressure Water Jetting.
- F. Underwriters' Laboratory (UL):
1. UL 3P83 - Drinking Water System Components - Health Effects.
- G. Unless otherwise specified, all work and materials for the preparation and coating of all metal surfaces shall conform to the applicable requirements specified in the Steel, Structures Painting Manual, Volume-2, Systems and Specifications, latest edition, published by the Steel Structures Painting Council.

1.04 DEFINITIONS

- A. Submerged Metal: Steel or iron surfaces below tops of channel or structure walls which will contain water even when above expected water level.
- B. Submerged Concrete and Masonry Surfaces: Surfaces which are or will be:
- C. Underwater.
- D. In structures which normally contain water.
- E. Below tops of walls of water containing structures.

- F. Exposed Surface: Any metal or concrete surface, indoors or outdoors that is exposed to view.
- G. Dry Film Thickness (DFT): Thickness of fully cured coating, measured in mils.
- H. Volatile Organic Compound (VOC): Content of air polluting hydrocarbons in uncured coating product measured in units of grams per liter or pounds per gallon, as determined by EPA Method 24.
- I. Ferrous: Cast iron, ductile iron, wrought iron, and all steel alloys except stainless steel.
- J. Where SSPC surface preparation standards are specified or implied for ductile iron pipe or fittings, the equivalent NAPF surface preparation standard shall be substituted for the SSPC standard.

1.05 SUBMITTALS

- A. Shop Drawings: Include schedule of where and for what use coating materials are proposed in accordance with requirements for Product Data. Per Submittal Procedures: Section 01 33 00
- B. Color Schedule. Finish coat colors for all painting and protective-coating systems shall match existing colors as closely as possible unless otherwise specified by Owner. New piping shall receive finish coats of the same color as existing piping which it replaces. Contractor shall prepare and submit for Owners approval a color schedule for finish coatings for all piping, mechanical equipment, electrical equipment and other surfaces to be protected. Owner shall approve of color selections prior to Contractors delivery of surplus.
- C. Samples:
 - 1. Prepare and submit for Owner's approval one (13) copies of color samples on 8-1/2" x 11" size cards for each protective coating system. Each sample card shall clearly show each coat of the finish system, and shall be clearly marked with the manufacturer's name and product identification, and shall be submitted in sufficient time to allow for approval and, if necessary, disapproval and resubmittal without causing any delay of the Project.
 - 2. As hereinbefore specified, Contractor shall furnish one (1) sq. ft. steel panels to be abrasive blasted in accordance with the abrasive blasting specifications and to be coated with a non-yellowing shellac, to be used as the standard for preparation of steel surfaces for the duration of this Project unless otherwise specified by Owner.
- D. Product Data Sheets: Contractor shall submit paint and coatings material manufacturers' printed technical data sheets for products intended for use in each of various paint and coating system. Data sheets shall fully describe material as to its intended use, make-up, recommended surface preparation and application conditions, primers, material mixing and application, minimum and maximum re-coat times (including recommended dry mil thickness), precautions, safety and maintenance cleaning directions.

E. Manufacturer's Instructions: Include the following:

1. Special requirements for transportation and storage.
2. Mixing instructions.
3. Shelf life.
4. Pot life of material.
5. Precautions for applications free of defects.
6. Surface preparation.
7. Method of application.
8. Recommended number of coats.
9. Recommended dry film thickness (DFT) of each coat.
10. Recommended total dry film thickness (DFT).
11. Drying time of each coat, including prime coat.
12. Required prime coat.
13. Compatible and non-compatible prime coats.
14. Recommended thinners, when recommended.
15. Limits of ambient conditions during and after application.
16. Time allowed between coats (minimum and maximum).
17. Required protection from sun, wind and other conditions.
18. Touch-up requirements and limitations.
19. Material Safety Data Sheet.

F. Quality Assurance Submittals:

1. Quality Assurance plan.
2. Qualifications of coating applicator including List of Similar Projects.

G. Submit Notarized Certificate that:

1. All paints and coatings to be used on this project comply with the State of California Air Resources Board Rule 1113 VOC Regulations effective as of January 1, 2006; and that
2. All paints and coatings to be used on this project comply with the VOC regulations of the State of California Air Management District in which the coatings will be used, effective January 1, 2006.
3. Coating Materials List:
 - a. The Contractor shall provide three (3) copies of a paint and coating materials list which indicates the manufacturer and paint number, keyed to the Painting and Coating Schedules herein, for approval of the Owner prior to or at the time of submittal of samples required herein.
 - b. The Contractor shall include with his submittal, his protective coating schedule for shop and field coatings of items to receive protection. The schedule shall conform to the specified requirements for surface preparation, priming, and coating for items covered, and shall follow the same requirements for similar work where such work has not been specifically called out. No bare ferrous nonworking surfaces shall be omitted from the schedule. Particular care shall be taken to cover in sufficient detail the coating of mechanical joints and other mechanical

- devices which shall conform to the recommended practice of the manufacturer of the joint or other mechanical devices.
- c. For all patching of existing surfaces, Contractor shall verify the type of existing coating on the surface whose new coatings are to be applied. Contractor shall include in his submittal documentation that new coatings to be applied are compatible with existing coatings.
 - d. Submittal shall be sufficiently early to permit Owner's review and then Contractor's coordination with affected material and equipment suppliers to assure their use of approved shop coats of same manufacture as field coats and compatibility with field applied coats for respective coating systems.
 - e. Coatings to be used on plastic and fiberglass materials shall be certified as acceptable by all plastic and fiberglass manufacturers whose products are to be coated. Certification copies shall be submitted to the Owner. The Contractor shall be certified in writing by the painting and coating material manufacturers as a qualified applicator of their products for the past five years, and copies of the certification submitted to the Owner.

1.06 QUALITY ASSURANCE

A. Applicator Qualifications:

1. Minimum of 5 years experience applying specified type or types of coatings under conditions similar to those of the Work.
 - a. Provide qualifications of applicator and references listing five similar projects completed in the past two years.
2. Manufacturer approved applicator when manufacturer has approved applicator program.
3. Approved and licensed by polymorphic polyester resin manufacturer to apply polymorphic polyester resin coating system.
4. Approved and licensed by elastomeric polyurethane (100 percent solids) manufacturer to apply 100 percent solids elastomeric polyurethane system.
5. Applicator of off-site application of coal tar epoxy shall have successfully applied coal tar epoxy on similar surfaces in material, size, and complexity as on the Project.

B. Regulatory Requirements: Comply with governing agencies regulations by using coatings that do not exceed permissible volatile organic compound limits and do not contain lead.

1. Do not use coal tar epoxy in contact with drinking water.

C. Certification: Certify that applicable pigments are resistant to discoloration or deterioration when exposed to hydrogen sulfide and other sewage gases and product data fails to designate coating as "fume resistant."

D. Field Samples: Prepare and coat a minimum 100 square foot area between corners or limits such as control or construction joints of each system. Approved field sample may be part of Work.

- E. Compatibility of Coatings: Use products by same manufacturer for prime coats, intermediate coats, and finish coats on same surface, unless specified otherwise.
- F. Services of Coating Manufacturers Representative: Arrange for coating manufacturer's representative to attend pre-installation conferences. Make periodic visits to the project site to provide consultation and inspection services during surface preparation and application of coatings, and to make visits to coating plants to observe and approve surface preparation procedures and coating application of items to be "shop primed and coated".

1.07 PROTECTION OF WORK

- A. The Contractor shall be responsible for any and all damage to his work or the work of others during the time his work is in progress, including any over spray claims.

1.08 EXTRA STOCK

- A. The Contractor shall deliver to the Owner a minimum of two (2) one (1) gallon cans of each type and color of finish paint and coating used on the project and one (1) one (1) gallon cans of each primer or two (2) percent of each type and color of finish paint and coating used on the project and one (1) percent of each primer, whichever is greater. Each container shall be unopened and properly labeled for identification.

1.09 RIGHT OF REJECTION

- A. The Owner shall have the right to reject all material or work that is unsatisfactory, and require the replacement of either or both at the expense of the Contractor.

1.10 JOB CONFERENCE

- A. Prior to commencing work, a pre-job conference shall be held for the purpose of reviewing and clarifying the painting and coating requirements of the project. The Owner, Contractor, Applicator, Coatings and Paint Manufacturers representative, and the Owner designated Inspector shall be present. A schedule of work to be accomplished will be established.

PART 2 - PRODUCTS

2.01 COATING SYSTEMS

- A. Systems specified herein may be superseded by the manufacturer during the period of the on-call contract. If a coating system is superseded by the manufacturer, the contractor shall supply in writing a letter from the manufacturer which states the system has been superseded, the new system components, changes in handling, application and preparation necessary.

2.02 GENERAL

- A. Surfaces to receive paint or other protective coating materials as herein

specified in this Section shall be coated in conformance with the applicable coating systems specified herein. All materials specified by name and/or manufacturer or selected for use under these Specifications, shall be delivered unopened at the job site in their original containers and shall not be opened until inspected by the Owner. No coating shall be over 12 months from manufacturing date. Whenever a manufacturer's brand name is specified, it is intended to define the general type and quality of paint or coating desired. Other coatings or paints of equal quality as judged by the Engineer may be used. Coating materials shall be a product of Ameron, Carboline, Tnemec; or equal. All paint and coatings shall be produced and applied as herein called for or, if not specifically called for, shall be applied in accordance with the manufacturer's printed recommendations as approved by Owner. So far as possible, all paint and coating materials shall be provided by a single source supplier.

- B. Surface Preparation Salt Testing and Removal: Abrasive blasted and machine tooled surfaces (Service Condition A, B, C, D, and E) to be coated shall be tested within one hour for chloride, sulfate and nitrate salt contamination using the CHLOR*TEST 'CSN' Test Kit, or equal. An "or equal" test kit shall conform to the following requirements: (1) Kit will contain all materials, supplies, tools and instructions for field testing and on-site quantitative analysis; (2) Kit extraction solution shall be acidic, factory pre-measured, pre-packaged, and uniform concentration; (3) Kit components shall be mercury free and environmentally friendly; (4) Kit shall contain a factory sealed titration device; (5) Kit shall contain new materials and solutions for each test; (6) Test container shall create a sealed, encapsulated environment during sample extraction; (7) All tests should read direct measurements in micrograms per square centimeter without the need for conversion charts or tables. Tests shall be performed on metal loss areas when present. Metal loss areas are those areas that show evidence corrosion or pitting. When metal loss areas are not evident, tests shall be performed adjacent to weld areas, if present. Otherwise, test sites shall be selected to representative of the surface as a whole.
- C. For Service Condition A, and E, the floor, ceiling and side walls shall be considered three separated areas.
1. Each area shall be tested at the rate of three tests per 1000 ft² or part thereof.
 2. One or more chloride measurements greater than 3 µg/cm² are evidence or excessive chloride contamination.
 3. One or more sulfate measurements greater than 10 µg/cm² are evidence of excessive sulfate contamination.
 4. One or more nitrate measurements greater than 5 µg/cm² are evidence of excessive nitrate contamination.
 5. Excessively contaminated surfaces shall be considered non-compliant and washed with water modified with CHLOR*RID, a soluble salt remover and allowed to dry, or equal. An "or equal" chemical removal product shall meet

the following criteria: (1) Remover shall be acidic; (2) remover shall be biodegradable; (3) nontoxic; (4) non-corrosive; (5) non-flammable. Washing will require a minimum of 3000psi using a spinner nozzle held no further than 10 inches from the surface. The operator shall apply the wash solution at the rate of approximately 300 square feet of surface area per 100 US gallons of wash solution. Manufacturer's directions shall be followed.

6. Re-test and re-wash until all required tests show allowable results.
- D. For Service Condition B, C, and D, test at the rate of three tests for the first 1000 ft² or part thereof and one test for each additional 3000 ft² or part thereof.
1. One or more measurements greater than 5 µg/cm² are evidence of excessive chloride contamination.
 2. One or more sulfate measurements greater than 15 µg/cm² are evidence of excessive sulfate contamination.
 3. One or more nitrate measurements greater than 5 µg/cm² are evidence of excessive nitrate contamination.
 4. Excessively contaminated surfaces shall be considered non-compliant and washed with water modified with CHLOR*RID, a soluble salt remover and allowed to dry, or equal as defined above. Washing will require a minimum of 3000psi using a spinner nozzle held no further than 10 inches from the surface. The operator shall apply the wash solution at the rate of approximately 300 square feet of surface area per 100 US gallons of wash solution. Manufacturer's directions shall be followed.
 5. Re-test and re-wash until all required tests show allowable results.

2.03 PAINT AND COATING MATERIALS

- A. Definitions: The term "coating materials," as used herein, shall include enamels, paints, sealers, epoxy resins, and all other paints and protective coatings, excepting galvanizing, whether used as a pretreatment, primer, intermediate coat, or finish coat.
- B. Decorative and protective coating materials shall be sealed in containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer, all of which shall be plainly legible at the time of use. Pigmented paints shall be furnished in containers not larger than five (5) gallons. Materials shall conform to the specifications shown herein and to the requirements hereinafter specified.
- C. Compatibility: Only compatible materials shall be used in the Work. Particular attention shall be directed to compatibility of primers and finish coats. If necessary, subject to approval of the Owner, a compatible barrier coat shall be applied between all existing prime coat and subsequent field coats to insure compatibility.

- D. Colors: All colors and shades of colors of all coats of paints and protective coating material shall be as selected by the Owner. Each coat shall be of a slightly different shade, as directed by the Owner to facilitate inspection of surface coverage of each coat.

2.04 SERVICE CONDITION SUMMARY

<u>Condition</u>	<u>Description</u>
A	Ferrous, submerged, wet
B	Ferrous, normal air exposure, galvanized
C	Ferrous, corrosive atmosphere
D	Non-ferrous, corrosive atmosphere
Q	Concrete block exterior clear sealant

2.05 SERVICE CONDITION C

- A. Use service condition C for all building painting.
- B. Ferrous metals, other than stainless steel, within wet wells and similar locations subject to a corrosive atmosphere and condensation shall be prepared and coated in accordance with the following requirements.
- C. Surface Preparation: All metal surfaces shall be abrasive blasted in accordance with Steel Structures Painting Council Specification SSPC-SP5 (White Metal Blast Cleaning). Weld surface, edges and sharp corners shall be ground to a radius and all weld splatter removed.
- D. Application: Application shall be in strict conformance with the manufacturer's printed recommendations. A minimum of 12 hours time is required before additional coats may be applied to the prime coat. Application shall be in strict conformance with tile manufacturer's printed recommendations. All sharp edges, nuts, bolts, or other items difficult to coat shall receive a brush-applied coat of the specified coating prior to application of each coat.
- E. Coating Systems C: Except as hereinafter specified, the prime coat shall have a minimum dry film thickness of 5 mils; the intermediate coat, 5 mils; and the final coat, 5 mils. The total system shall have a minimum dry film thickness of 15 mils.

Carboline System:	Primer – Carboguard 890	5.0 to 6.0 mils DFT
	Intermediate Carboguard 890	5.0 to 8.0 mils DFT
	Finish Coat – Carboguard 890	5.0 to 8.0 mils DFT
Devoe System:	Primer – Bar-Rust 236	5.0 to 6.0 mils DFT
	Intermediate- Bar Rust 236	5.0 to 8.0 mils DFT
	Finish Coat – Bar-Rust 236	5.0 to 8.0 mils DFT
Tnemec System:	Primer – Series 69	5.0 to 8.0 mils DFT
	Intermediate- series 69	5.0 to 8.0 mils DFT
	Finish Coat – Series 69	5.0 to 8.0 mils DFT

PPG	Primer-PPG/Amercoat Amerlock 2VOC	5.0 to 8.0 mils DFT
System:	Intermediate-PPG/Amercoat Amerlock 2VOC	5.0 to 8.0 mils DFT
	Finish Coat-PPG/Amercoat Amerlock 2VOC	5.0 to 8.0 mils DFT

2.06 SERVICE CONDITION Q

- A. See the Section 04176 for Masonry coatings

2.07 PATCH COAT FOR GALVANIZED SURFACES

- A. All galvanized surfaces which are scratched, marred, or otherwise damaged shall be patched with Carboline's Carbo Zinc 11, "Drygalv" by American Solder and Flux Co., or equal, prior to application of other coatings required for designated service condition.

2.08 MISCELLANEOUS COATINGS

- A. Hand wheels and operating handles of all valves and equipment shall be safety red, matching OSHA Safety Red Color, using Coating System "C".

PART 3 - EXECUTION

3.01 GENERAL

- A. All surface preparation, coating and painting shall conform to applicable standards of the National Association of Corrosion Engineers, the Steel Structures Painting Council, the American Concrete Institute, the Forest Products Research Society and the Manufacturer's printed instructions. Material applied prior to approval of surface by the Owner or owner's representative shall be removed and re-applied to the satisfaction of the Owner or owner's representative at the expense of the Contractor.
- B. All work shall be performed by skilled craftsmen qualified to perform the required work in a manner comparable with the best standards of practice.
- C. Dust, dirt, oil, grease or any foreign matter that will affect the adhesion or durability of the finish must be removed by washing with clean rags dipped in an approved cleaning solvent and wiped dry with clean rags.
- D. Where prime coatings are shop applied, instruct suppliers to provide the prime coat compatible with the finish coat specified. Any off-site work which does not conform to the specification is subject to rejection by the Owner or owner's representative.
- E. Shop applied prime coatings which are damaged during transportation, construction or installation shall be thoroughly cleaned and touched up in the field as directed by the Owner or Owner's representative. Use repair procedures which insure the complete protection of all adjacent primer. The specified repair method and equipment may include wire-brushing, hand or power tool cleaning or dry air blast cleaning. In order to prevent injury to surrounding painted areas blast cleaning may require use of lower air pressure, smaller nozzle and abrasive particle sizes, short blast nozzle

- distance from surface, shielding and masking. If damage is too extensive or uneconomical to touch-up, the item shall be re-cleaned and coated or painted as directed by the Owner or Owner's representative.
- F. Previously painted surfaces: Repair surface defects. Remove grease, oil and other contaminants as specified for steel surfaces. Scrape carefully to remove deteriorated coatings. Glossy or very hard coatings should be sanded lightly to promote maximum adhesion of the subsequent coating. Surface must be thoroughly dry before coating.
- G. The coating and painting equipment shall be designed for application of materials and shall be maintained in first class working condition. Compressors shall have suitable traps and filters to remove water and oils from the air. The equipment shall be subject to approval by the Owner or Owner's representative.
- H. Application of the first coat shall follow immediately after surface preparation and cleaning and within an eight hour working day. Any cleaned areas not receiving first coat within eight-hour period shall be re-cleaned prior to application of first coat.
- I. Prior to assembly, all surfaces made inaccessible after assembly shall be prepared as specified herein and shall receive the coating or paint system specified.
- J. Material that Contractor believes may be hazardous waste or hazardous material, as defined in Section 25117 of the Health and Safety Code (including, without limitation, asbestos, lead, PCBs, petroleum and related hydrocarbons, and radioactive material) that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law ("hazardous material").
- K. Work involving lead and/or zinc are subject to regulation. Contractor agrees to provide the required notice of intent to renovate or demolish to the appropriate state or federal agency having jurisdiction, by certified mail, return receipt requested, or by some other method of transmittal for which a return receipt is obtained, and to send a copy of that notice to District. Contractor shall not conduct any Work involving lead-containing materials or zinc unless Contractor has first confirmed that the appropriate agency having jurisdiction is in receipt of the required notification. All permits, licenses, bonds required by governmental or quasi-governmental authorities, fees, deposits, tap fees, offsite easements and lead and zinc disposal facilities necessary for the prosecution of the Work shall be procured and paid for by Contractor. Contractor shall give all notices and comply with the Law bearing on the conduct of the Work as drawn and specified. If Contractor observes or reasonably should have observed that Plans and Specifications and other Contract Documents are at variance there with, it shall be responsible for promptly notifying District in writing of such fact. If Contractor performs any Work contrary to the Law without such notice to District, it shall bear all costs arising there from.

- L. When applicable, contractor shall submit and execute a Lead Compliance Program in accordance with CCR Title 8, Section 1532.1 (Cal/OSHA). The plan shall include the following items:
 - 1. Training, medical, and respirator approval documentation for all employees who will work at the site.
 - 2. The identity of the Competent Person, as defined by Cal/OSHA.
 - 3. Material Safety Data Sheets for hazardous materials brought onto the site.
 - 4. The Contractor's procedures for identifying and reporting unforeseen hazards.
 - 5. The names and addresses of the waste hauler and the landfill for hazardous and non-hazardous wastes.

3.02 SURFACE PREPARATION, METALLIC SURFACES

- A. Surface preparation will be based on comparison with: "Pictorial Surface Preparation Standards for Painting Steel Surfaces", SSPC-Vis 1, ASTM Designation D220: "Standard Methods of Evaluating Degree of Rusting on Painted Steel Surfaces", SSPC-Vis 2, ASTM Designation D610; "Visual Standard for Surfaces of New Steel Air-blast Cleaned with Sand Abrasive", NACE Standard TM-01-70; and as described below. Anchor profile for prepared surfaces shall be measured by use of a non-destructive instrument such as a Keane-Tator Surface Profile Comparator or Testex Press-O-Film System.
- B. To facilitate inspection, on the first day of abrasive blast cleaning operations, blast clean metal panels to the standard specified. These panels shall be equivalent to the supplied plate stock which is to be coated or painted and shall have minimum measurements of 8-1/2 inches by 11 inches. After agreeing a specific panel meets the requirements of the specification, it shall be initialed by the Contractor and Owner or Owner's representative prior and coated with a clear non-changing finish. Panels shall be utilized for inspection purposes throughout the duration of blast cleaning operations.
- C. Heavy deposits of grease or oil shall be removed with solvent oil cleaner and any chemical contamination shall be neutralized and/or flushed off prior to any other surface preparation.
- D. Surfaces scheduled for Near White or Commercial Blast Cleaning shall have all welds, edges, and sharp corners ground to a 1/16-inch radius and have all weld splatter removed. Sandblast in accordance with Steel Structures Painting Council Specifications, removing mill scale, rust, dirt, paint, or other foreign matter, leaving a slightly roughened surface to form a suitable anchor pattern for the coating application. Do not leave blasted surfaces overnight before coating. Remove all sand from the surface by brush or industrial vacuum.
- E. All other steel not scheduled for blast cleaning shall have all weld splatter removed, and rough edges and rough welds ground, and shall be cleaned by means of hand or power tools, in accordance with Steel Structures Painting

- Council Specification No. 2 or No. 3, removing all loose mill scale rust, dirt, paint, or other contaminants. Blast cleaning may be used if practical. The remaining mill scale, rust, and paint must be sufficiently abraded to provide for good bonding of the coating.
- F. Field blast cleaning for all surfaces shall be dry method unless otherwise directed.
 - G. Particle size of abrasives used in blast cleaning shall be that which will produce a 2 mil (50.0 microns) surface profile or in accordance with recommendations of the manufacturer of the specified coating or paint system to be applied.
 - H. Abrasive used in blast cleaning operations shall be new, washed, graded and free of contaminants that would interfere with adhesion of coating or paint and shall not be reused unless specifically approved by the Owner or Owner's representative.
 - I. During blast cleaning operations, caution shall be exercised to insure that existing coatings or paints are not exposed to abrasion from blast cleaning.
 - J. Keep the area of work in a clean condition and do not permit blasting materials to accumulate as to constitute a nuisance or hazard to performance of work or operation of existing facilities.
 - K. Blast cleaned surfaces shall be cleaned prior to application of specified coatings or paints by a combination of blowing with clean dry air, brushing/brooming and/or vacuuming as directed by the Owner or Owner's representative.
 - L. All welds shall be cleaned with a suitable chemical compatible with the specified coating materials.
 - M. Specific Surface Preparation: Surface preparation for the specific system shall be as designated in the Systems Index, Part 2.05 of these specifications.
 - N. Application SSPC specifications are as follows:
 - 1. Solvent Cleaning (SSPC-SP1): Removal of oil, grease, soil and other contaminants by use of solvents, emulsions, cleaning compounds, steam cleaning or similar materials and methods which involve a solvent or cleaning action.
 - 2. Hand Tool Cleaning (SSPC-SP2): Removal of loose rust, loose mill scale and other detrimental foreign matter to degree specified by hand chipping, scraping, sanding, and wire-brushing.
 - 3. Power Tool Cleaning (SSPC-SP3): Removal of loose rust, loose mill scale and other detrimental foreign matter to degree specified by power wire-brushing, power impact tools or power sanders.
 - 4. White Metal Blast Cleaning (SSPC-SP5): Blast cleaning to a gray-white uniform metallic color until each element of surface is free of all visible residues.

5. Commercial Blast Cleaning (SSPC-SP6): Blast cleaning until at least two-thirds of each element of surface area is free of all visible residues.
6. Brush-off Blast Cleaning (SSPC-SP7): Blast cleaning to remove loose rust, loose mill scale and other detrimental foreign matter to degree specified.
7. Near White Blast cleaning (SSPC-SP10): Blast cleaning to nearly white metal cleanliness, until at least 95 percent of each element of surface area is free of all visible residues.

3.03 SURFACE PREPARATION, CONCRETE AND MASONRY TO BE PAINTED

- A. This section specifies surface preparation for all concrete and masonry that will be painted.
- B. Concrete and masonry shall cure at least 28 days and have a moisture content prior to coating or painting below 8 percent as measured by an instrument such as a Delmhorst Model DP, unless recommended otherwise by the paint manufacturer.
- C. All surfaces shall be thoroughly cleaned by abrasive blasting (ASTM D4259), wire-brushing acid etching (ASTM D4260), or other approved methods, removing all traces of foreign materials. Remove all loose concrete and masonry by chipping or other approved methods to leave only a sound, firmly bonded substrate. Cracks and voids shall be repaired or filled as directed by the Owner or Owner's representative with approved suitable materials, mixed and applied in strict accordance with the Manufacturer's printed instructions. In general, final surface shall be smooth and free of voids, cavities, dirt, dust, oils, grease, or other contaminants.
- D. Where oil or grease deposits are present, prior to above surface preparation, clean surfaces by scrubbing with a solution of one and one-half ounces (44.4 ml) tri-sodium phosphate (TSP) and one and one-half ounces (44.4 ml) of non-sudsing detergent mixed into one gallon (3.785 liters) of warm water. Surfaces shall then be flushed clean with fresh water.
- E. Specific Surface Preparation: Surface preparation for the specific system shall be as designated in the Systems Index, Part 2.05 of these specifications.

3.04 SURFACE PREPARATION, CONCRETE AND MASONRY TO BE SEALED

- A. This section specifies surface preparation for all concrete and masonry that will be sealed.
- B. Concrete and masonry shall cure at least 28 days and have a moisture content prior to coating or painting below 8 percent as measured by an instrument such as a Delmhorst Model DP, unless recommended otherwise by the paint manufacturer.
- C. All surfaces shall be thoroughly cleaned by abrasive blasting (ASTM D4259), wire-brushing acid etching (ASTM D4260), or other approved methods, removing all traces of foreign materials. Remove all loose concrete and masonry by chipping or other approved methods to leave only a sound, firmly

- bonded substrate. Cracks and voids shall be repaired or filled as directed by the Owner or Owner's representative with approved suitable materials, mixed and applied in strict accordance with the Manufacturer's printed instructions. In general, final surface shall be smooth and free of voids, cavities, dirt, dust, oils, grease, or other contaminants.
- D. Where oil or grease deposits are present, prior to above surface preparation, clean surfaces by scrubbing with a solution of one and one-half ounces (44.4 ml) tri-sodium phosphate (TSP) and one and one-half ounces (44.4 ml) of non-sudsing detergent mixed into one gallon (3.785 liters) of warm water. Surfaces shall then be flushed clean with fresh water.
- E. Specific Surface Preparation: Surface preparation for the specific system shall be as designated in the Systems Index, Part 2.05 of these specifications.

3.05 SURFACE PREPARATION, WOOD AND COMPOSITION MATERIALS

- A. Wood and composite materials shall have a moisture content prior to coating or painting below 15 percent as measured by an instrument such as a Delmhorst Model BD-7, unless recommended otherwise by the paint manufacturer.
- B. All surfaces shall be thoroughly cleaned by use of mineral spirits, scrapers, sandpaper, or wire brushes to remove all dirt, oil, grease or other foreign substances. Finished surfaces exposed to view shall, if necessary, be made smooth by planing or sandpapering. Small, dry, seasoned knots shall be scraped, sandpapered, and thoroughly cleaned, and shall be given a thin coat of WP-578 Western Pine Association knot sealer before application of the priming coat. Large, open unseasoned knots, and all beads or streaks of pitch shall be scraped off, or if the pitch is still soft, it shall be removed with mineral spirits and the resinous area shall be thinly coated with knot sealer. After priming, all holes and imperfections shall be filled with putty or plastic wood (colored to match the finish wood), allowed to dry, and sandpapered smooth. Painting of interior wood and composite materials shall proceed insofar as practicable, only after masonry work has dried. Existing surfaces shall be cleaned of all loose or flaking paint and sandpapered as required.
- C. Specific Surface Preparation: Surface preparation for the specific system shall be as designated in the Systems Index, Part 2.05 of these specifications.

3.06 MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Remove grilles, covers and access panels for mechanical and electrical system from location and coat separately.
- B. Finish coat primed equipment with color selected by the owner or owner's representative.
- C. Prime and coat insulated and bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars and supports, except where items are plated

- or covered with prefinished coating.
- D. Replace identification markings on mechanical or electrical equipment when coated over or spattered.
 - E. Coat interior surfaces of air ducts, convector and baseboard heating cabinets that are visible through grilles and louvers with 1 coat of flat black paint, to limit of sight line.
 - F. Coat dampers exposed immediately behind louvers, grilles, convector and baseboard cabinets to match face panels.
 - G. Coat exposed conduit and electrical equipment occurring in finished areas with color and texture to match adjacent surfaces.
 - H. Coat both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.
 - I. Color code equipment, piping, conduit and exposed ductwork and apply color banding and identification, such as flow arrows, naming and numbering, in accordance with painting schedule and the latest release of the UPC.

3.07 SPECIAL REQUIREMENTS FOR GALVANIZED AND NON-FERROUS METALS

- A. Where galvanized or non-ferrous metals are scheduled to be painted, the surface shall be coated before application of the prime coat with a passivator or vinyl acid wash compound in accordance with the recommendations of the manufacturer of the prime and finish coatings to be used. The thickness of this coating and the zinc galvanizing (if present) shall not be included within the total system thickness as specified in this section.

3.08 MANUFACTURER'S RECOMMENDATIONS

- A. Unless otherwise specified herein, the paint and coating manufacturer's printed recommendations and instructions for thinning, mixing, handling, applying, minimum and maximum re-coat windows, sweat in times, and protection of his coating materials; for preparation of surfaces for coating; and for all other procedures relative to coating shall be strictly observed. Use only manufactures thinners. No substitutions or other deviations will be permitted without written permission of the Owner.

3.09 DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
 - 1. Deliver abrasive grit in original moisture-proof bags or airtight bulk containers.
 - 2. Deliver coating system materials in original, unopened containers with seals unbroken and labels intact. Labels shall identify type of material, color, date of manufacture, and batch number. No batch shall be over twelve months from original date of manufacture.
- B. Storage:

1. Store materials in a single, approved location.
2. Store coating system materials in enclosed and ventilated structures. Maintain temperature inside the structure within the temperature range recommended by the manufacturer.
3. Coating materials and equipment shall be stored in designated areas. Coating containers shall be opened only when required for use. Coatings shall be mixed only in designated rooms or spaces in the presence of the Owner's Representative. Coating shall be thoroughly stirred, boxed or agitated utilizing air powered or electric drills to uniformly smooth consistency and prepared and handled in a manner to prevent deterioration and inclusion of foreign matter. Unless otherwise specified or approved, no materials shall be reduced, changed, or used except in accordance with the manufacturer's label or data sheet. All coatings shall be VOC compliant.

3.10 SAFETY REQUIREMENTS

- A. In accordance with the requirements of the applicable OSHA Regulations for Construction, the Contractor shall provide and require the use of personal protective lifesaving equipment for all persons working in or about the project site.
- B. Respirators shall be worn by all persons engaged in, and assisting in, spray painting. In addition, workers engaged in or near the work during sandblasting shall wear eye and face protection devices meeting the requirements of ANSI Z87.1 latest revision, and approved OSHA Regulations for abrasive blasting operations and approved air-purifying, half-mask or mouthpiece respirator with appropriate filter. All blast line couplings shall be equipped with cable chokers and automatic shut off devices.
- C. Ventilation. Where ventilation is used to control potential exposure to workers as set forth in Section 1914.94 of the OSHA Regulations for Construction, ventilation shall be adequate to reduce the concentration of the air contaminant to the degree that a hazard to the worker does not exist. Methods of ventilation shall meet the requirements set forth in ANSI-Z9.2, latest revision.
- D. Sound Levels. In accordance with Sections 1926.52 and 1926.101 of OSHA Regulations For Construction, whenever the occupational noise exposure exceeds maximum sound levels as set forth in Table D-2 ear protective devices shall be fitted and determined individually and used, and a continuing, effective hearing conservation program shall be administered.
- E. Storage and mixing of coating materials shall be performed only in those areas designated by the Owner. All coatings and thinners shall be stored in a locked container with proper ventilation. All compressors shall be placed in secondary containment.
- F. Cloths and cotton waste that might constitute a fire hazard shall be placed in closed metal containers or destroyed at the end of each work day.

3.11 STORAGE MIXING AND THINNING

- A. Paint and coating materials shall be protected from exposure to cold weather, and shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Materials of different manufacturers shall not be mixed together. Packaged materials may be thinned immediately prior to application in accordance with the manufacturer's directions. Only mixing of full kits will be allowed, No splitting of kits.

3.12 WORKMANSHIP

- A. Skilled craftsmen and experienced supervision shall be used on all work.
- B. All paint and coatings shall be applied in a workmanlike manner so as to produce an even film of specified uniform thickness. Edges, corners, crevices, and joints shall receive special attention to insure that they have been thoroughly cleaned and that they receive an adequate thickness of paint. The finished surfaces shall be free from runs, drops, drips, ridges waves, laps, brush marks, and variations in color, texture, and finish. The hiding shall be so complete that the addition of another coat of paint would not increase the hiding. All coats shall be applied so as to produce a film of uniform thickness. Special attention shall be given to insure that edges, corners, crevices, welds, and similar areas receive a film thickness equivalent to adjacent areas, and installations shall be protected by the use of drop cloths or other approved precautionary measures.

3.13 PREPARATION FOR PAINTING AND PROTECTIVE COATING

- A. All surfaces to receive paint and protective coatings shall be cleaned as specified herein prior to application of coating materials. The Contractor shall examine all surfaces to be coated, and shall correct all surface defects before application of any coating material. Beginning the work of this Section without reporting unsuitable conditions to the Owner constitutes acceptance of conditions by the Contractor. Any required removal, repair, or replacement of this work caused by unsuitable conditions shall be done at no additional cost to the Owner. All marred or abraded spots on shop-primed and factory-finished surfaces shall receive touch-up restoration prior to any other coating application.

3.14 ITEMS NOT TO BE COATED

- A. Hardware, hardware accessories, name plate data tags, machined surfaces and similar items in contact with coated surfaces not to be coated shall be removed or masked prior to surface preparation and painting operations. Following completion of coating of each piece, removed items shall be reinstalled. Such removal and installation shall be done by workmen skilled in the trades involved.

3.15 ABRASIVE BLASTING

- A. All abrasive blasting shall be done in strict accordance with the referenced specifications of the Steel Structures Painting Council and shall conform to all

- regulations of the local and State (CARB) Air Pollution Control Agency.
- B. When items are to be shop primed or shop primed and finish coated in the shop, surface preparation shall be as specified in this Section. The Owner shall have the right to witness, inspect, and reject any abrasive blasting done in the shop. If automatic blast units are used the working mixture of abrasive shall be 75% grit and 25% shot.
 - C. For treatment plant facilities and other applicable areas- Contractor shall provide suitable protection from inclement weather while Abrasive blasting is in progress to ensure that all required standards for surface preparation are met. Should unforeseen difficulties develop in performing abrasive blasting outside the plant, Owner may allow temporary relocation of materials and equipment to designated areas inside the plant to maintain progress. Such permission shall be granted entirely at Owners discretion, must be in writing, and shall not relieve Contractor's responsibility for maintaining required standards of quality and progress on the work. When abrasive blasting is done inside the plant, care shall be taken to prevent damage to structures and equipment. The work area shall be enclosed by tarps and or dust collectors and, in addition, pumps, motors, and other equipment shall be shielded, covered, or otherwise protected to prevent the entrance of abrasive or dust. No dust or overspray shall leave the tarp enclosure. Contractor shall be responsible for all over-spray and dust claims and any related damage. All blast equipment shall be equipped with oil/water separators and dryers. Air stream testing shall be performed daily in accordance with ASTM D 4285.
 - D. No Abrasive blasting may begin before the Owner inspects and approves the protective measures. The Contractor shall be responsible for all damage caused by or resulting from Abrasive blasting in all cases. Contractor shall be responsible for disposal of all blast residue in accordance with applicable Federal, State and Local regulations.
 - E. After abrasive blasting, dust and spent sand shall be removed from the surfaces by brushing and vacuum cleaning. Contractor shall be responsible for all cost for disposal of all blast residue in accordance with applicable Federal, State and Local regulations.
 - F. Dispose of all wastes from abrasive blasting, and any other wastes generated during the Work. Sample and test wastes as required by regulatory agencies, and as necessary for classification of wastes prior to disposal. This work includes all costs for waste sampling, testing, accumulation, transport, and disposal, including the cost for wastes classified as hazardous and non-hazardous.
 - G. To facilitate inspection, the Contractor shall, on the first day of abrasive blasting operations, provide and abrasive blast metal panels to the degree called for in the Specifications and as noted above. After Owner and Contractor mutually agree that a specific panel meets the requirements of the Specification, the panel shall be initialed by the Contractor and Owner and then be coated with a clear, non-yellowing finish. Panels shall be prepared for

each type abrasive blasting specified and shall be maintained and utilized by the Inspector throughout the duration of abrasive blasting operations.

- H. If lead is present on the project, a lead stabilization system may be used such as: Enviro-Prep 33010, manufactured by Hoffers Coatings, or equal. The system Chemical stabilization process shall render the paint non-hazardous which shall be tested and verified by the contractor. The material shall be disposed appropriately according to current regulations.

3.16 APPLICATION OF PROTECTIVE COATINGS

- A. Shop Coating: Fabricated metalwork and equipment which requires coating may be shop primed with specified primer, the field top coat will be from the same manufacture. Any such work delivered to the job site with any other shop coat shall have this coating removed and the specified coating applied in the field. Contractor shall be fully aware of all maximum re-coat times. Manufactured equipment with approved corrosion resistant factory finishes and galvanized finishes shall be exempt from this requirement of stripping. No red primers shall be allowed.
- B. Application of Field Coatings:
1. Except where in conflict with the manufacturer's printed instructions, or where otherwise specified herein, the Contractor may use brush, roller, air spray, or airless spray application; however, any spray painting must first have the approval of the Owner. Rollers for applying enamel shall have a short nap. Areas inaccessible to spray coating or rolling shall be coated by brushing or other suitable means.
 2. The Contractor shall give special attention to the work to insure that edges, corners, crevices, welds, bolts, and other areas, as determined by the Owner, receive a film thickness at least equivalent to that of adjacent coated surfaces. All coatings shall be uniform in gloss, color and appearance.
 3. All protective coating materials shall be applied in strict accordance with the manufacturer's printed instructions.
 4. Prime coat shall be applied to cleaned surfaces within a four hour period of the cleaning, and prior to deterioration or oxidation of the surface and in accordance with the manufacturer's recommendations. Drift from Abrasive blasting procedures shall not be allowed to settle on freshly painted surfaces, work area shall be clear of all visible dust.
 5. All coatings shall be applied in dry and dust-free environment. Do not apply coatings when air temperature is less than 5 degrees F above dew point. No coating or paint shall be applied when the surrounding air temperature, measured in the shade, is below 50 degrees F.
 6. The Contractor shall provide a heated environment to obtain temperature and humidity conditions if necessary to meet schedule requirements at no additional cost to the Owner.
 7. Do not abrasive blast when air temperature is less than 5 degrees F above dew point. No coating or paint shall be applied when it is expected that the relative humidity will exceed 85 percent or that the air temperature will drop

below 55 degrees F. within eight hours after the application of the coating or paint. Dew or moisture condensation should be anticipated and if such conditions are prevalent, coating or painting shall be delayed until mid-morning to be certain that the surfaces are dry. The day's coating or painting shall be completed well in advance of the probable time of day when condensation will occur, in order to permit the film a sufficient drying time prior to the formation of moisture or reaching the dew point.

8. Each coat shall be applied evenly, at the proper consistency, and free of brush marks, sags, runs, over spray, pin holes and other evidence of poor workmanship. Care shall be exercised to avoid lapping paint on glass or hardware. Coatings shall be sharply cut to lines. Finished coated surfaces shall be free from defects or blemishes. Protective coverings shall be used to protect floors, -fixtures, and equipment. Care shall be exercised to prevent paint from being spattered onto surfaces from which such paint cannot be removed satisfactorily. Surfaces from which paint cannot be removed satisfactorily shall be painted or repainted as required to produce a finish satisfactory to the Owner. Whenever two (2) coats of a dark, colored paint, are specified, the first coat shall lighter color to act as an indicator of proper coverage, or the two (2) coatings shall be of a contrasting color.
9. Touch-up of all surfaces shall be performed after installation.
10. All surfaces to be coated shall be clean and dry at the time of application.
11. Holiday test 100% per NACE RPO-188 all coatings in immersion and vapor areas, until no holidays are detected.

C. Time of Coating:

1. Manufacturer's recoat time shall be strictly complied with. Sufficient time shall be allowed to elapse between successive coats to permit satisfactory recoating, but, once commenced, the entire coating operation shall be completed without delay. No additional coating of any structure, equipment, or other item designated to be painted shall be undertaken without specific permission of the Owner until the previous coating has been completed for the entire structure, piece of equipment, or other item.
2. Piping shall not be finish coated until it has been pressure tested and approved.

D. Thickness of Coating: The dry film mil-thickness specified shall be achieved and verified for each coat, before applying next coat.

3.17 TESTING AND INSPECTION

A. Inspection Devices:

1. The Contractor shall furnish, until final acceptance of coating and painting, inspection devices in good working condition for detection of holidays and measurement of dry-film thickness of coatings and paints.
2. The Contractor shall also furnish U.S. Department of Commerce, National Bureau of Standards certified thickness calibration plates to test accuracy of dry-film thickness gauge and certified instrumentation to test accuracy. Dry-film thickness gauges shall be made available for the Inspector's use at

all times until final acceptance of application. Holiday detection devices shall be operated in the presence of the Inspector. Inspection devices shall be operated in accordance with the manufacturer's instructions at the direction of the Owner's Representative.

- B. The Inspector and Contractor shall conduct film thickness measurements and electrical holiday inspection of the coated surfaces with equipment furnished by him and shall recoat and repair as necessary for compliance with the Specifications. Contractor shall provide all manpower to move scaffolding and or ladders.
1. After repaired and recoated ferrous metals areas have cured, final inspection tests will be conducted by the Owner or Owner's Representative. Coating thicknesses specified in mils on ferrous substrates will be measured with a nondestructive magnetic type dry-film thickness gage such as the Positech 6000. Discontinuities, voids and pinholes in the coatings will be determined with a nondestructive type electrical holiday detector. Epoxy coatings and other thin film coatings will be checked for discontinuities and voids with a low voltage detector of the wet-sponge type, such as Model M1 as manufactured by Tinker and Razor. Use a non-sudsing type wetting agent, such as Kodak Photo-Flo, which shall be added to the water prior to wetting the sponge. A high voltage, low current, spark type detector such as, manufactured by D.E. Sterns 14/20. Contractor shall supply three 14" wire brush wands. Tape type coatings will be inspected for holidays using a device designed for use in detecting such flaws. All pinholes shall be marked, repaired in accordance with the manufacturer's printed recommendations and retested. No pinholes or other irregularities will be permitted. Coatings not in compliance with the Specifications will not be acceptable and shall be replaced, and re-inspected at Contractor's expense until the Specifications are met.
 2. Provide adequate lighting, without shadows, during all phases of work to insure that work is performed as specified. Illuminate entire area of work.
 3. Provide ground supported scaffolding and lighting, as determined by the Inspector, to facilitate visual and instrument inspection by the Inspector of each phase of the work and of the completed work. Place as directed to minimize glare and shadows.
 4. Provide personnel to move scaffolding and furnish other assistance to the District or District's representative as required.
 5. Inspector will examine surfaces after blast cleaning to verify that all deposits of contaminants have been removed. Contractor shall blow down, and vacuum all surfaces prior to inspection.
 6. Verify at a minimum of two times daily that air supply is free of oil and moisture contamination. Effective oil and water separators shall be used in all main compressor- airlines and shall be placed as close as practicable to the equipment. Prior to using compressed air, quality of air downstream of the separators shall be tested at suitable outlets by blowing the air on clean white blotter for 2 minutes to check for any contamination, oil, or moisture.

7. Measure air temperature, humidity, relative humidity, and metal surface temperature, and determine dew point and relative humidity prior to abrasive blasting or painting each day. Provide portable temperature / humidity recorders to provide continuous permanent hard copy of the reservoir conditions. Repeat measurements and determination of dew point as often as the Inspector deems necessary but not less often than every four hours.
 8. Maintain a written record of measurements and dew points, and time that measurements were taken. Make record available to Inspector immediately on request.
 9. Inspector will evaluate surface preparation using field abrasive blasting standards, and Testex tape. Evaluation will include inspection of blasted surfaces for dust and abrasive residue, using clear adhesive coated tape. Evaluation will be made immediately prior to coating application. Contractor will furnish 4 rolls of Testex tape 1.5 to 2.5 mils X-course prior to the start of abrasive blasting.
 10. Verify cleanliness of all spray application equipment prior to, or no later than, time of mixing coating material.
 11. Measure wet film thickness during coating application of coating to ensure adequate coating thickness. Take at least one measurement every 100 square feet.
 12. Measure dry film thickness after each coat using a non-destructive magnetic dry film thickness gauges.
 13. Inspector will also measure coating thickness, at random locations, after each coat.
 14. Inspector will evaluate cleanliness of coated surface immediately prior to application of a subsequent coat.
- C. Contractor shall test all coated surfaces for pinholes and holidays after application of the final coat in accordance with the following:
1. Perform test in presence of Inspector, or the inspector has the right to perform all testing.
 2. Perform test after coating has cured as recommended by the manufacturer. Immersion coatings: Contractor shall provide letter that coating is fully cured and ready to be placed in service.
 3. Re-test after coating repairs.
 4. On non-ferrous surfaces, dry film thickness readings shall be taken at random locations with a Tooke Gauge at the rate of approximately five readings per 100 square feet of surface. Grooves cut into coating shall be repaired by application of all coats of paint or coating film being tested. The average of all readings for a given area or surface shall be within required dry film thickness range and no individual reading shall be more than 0.1 percent below the recommended dry film thickness. Any areas that are found to be below standard shall be marked and recoated to obtain proper film thickness.
- D. Warranty Inspection: Warranty inspection shall be conducted during the

warranty period following completion of all coating and painting work. All personnel present at the Pre-Job Conference shall attend this inspection. All defective work shall be repaired in accordance with this specification and to the satisfaction of the Owner or his appointed representative. The inspection shall be conducted in coordination with the owner prior to the three-year warranty expiration unless otherwise agreed upon by Owner.

3.18 CLEANUP

- A. Upon completion of the work, staging, scaffolding, and containers shall be removed from the site or destroyed in an approved manner. Paint spots, oil, or stains upon adjacent surfaces shall be removed.
- B. The Contractor shall clean the site in accordance with the requirements for "Cleaning Up" in the "General Conditions."

END OF SECTION

SECTION 13120
PREFABRICATED BUILDING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Design, fabricate and erect the pre-engineered structures shown on the Drawings, including all primary and secondary structural framing members, connection bolts, roof and wall coverings, doors, flashing, fasteners, closures, sealer and other miscellaneous items as shown or as required to construct a complete and watertight structure. The Work includes two structures; the Material Storage Facility and the Wash Station.
- B. See the Contract Drawings for sizes and heights.

1.02 DRAWINGS AND CERTIFICATION

- A. The building manufacturer shall furnish complete erection drawings showing anchor bolt settings, sidewall, endwall, and roof framing, transverse cross-sections, covering and flashing details, and accessory installation details to clearly indicate the proper assembly of all building components. The manufacturer shall furnish a certificate, signed by a civil or structural engineer registered in the State of California that the building design meets the requirements of these specifications, applicable building codes and is in accordance with accepted engineering practices and manufacturer warranties.
- B. The drawings and calculations shall be submitted to Owner for submission to the reviewing agency.

1.03 DESIGN STANDARDS

- A. All structural steel members shall be designed for those sections of the following listed codes as considered to be applicable, by the building manufacturer, as related to design requirements and allowable stress.
 - 1. AISC – Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
 - 2. AISI – Specifications for the Design, Fabrication and Erection of Cold-formed Structural Members for Buildings.
 - 3. AWS – D1.1 Recommended Design Practices Manual.

PART 2 – DESIGN CRITERIA AND PRODUCTS

2.01 DESIGN LOADS

- A. All design criteria per the current California Building Code and the referenced edition of ASCE 7.

2.02 STRUCTURAL FRAMING

- A. General

1. All framing members shall be shop fabricated for bolted field assembly. Field cutting or drilling, when required, shall be clearly noted on the drawings.
2. Primary structural framing shall include the transverse rigid frame, end bearing frames, endwall columns and bracing.
3. Secondary structural framing shall include the purlins, girts, eave struts, flange bracing, sill support, clips and other miscellaneous structural parts.
4. All field connections shall be bolted. Bolts shall be machine bolts conforming to ASTM specification A-307 or ASTM Specification A-325. A-325 and A-307 tension control bolts are allowable.
5. All framing members shall carry an easily visible identifying mark, either stamped, stenciled or painted.

2.03 RIGID FRAMES, WING UNIT, CANOPY BEAMS

- A. All members shall be welded, built-up "I" shapes, either constant-depth or tapered, or standard structural steel shapes.

2.04 BEARING END FRAMES

- A. All members shall be welded, built-up "I" shapes, either constant-depth or tapered, or standard structural steel shapes.

2.05 ENDWALL COLUMNS

- A. All members shall be welded, built-up "I" shapes, either constant-depth or tapered, or standard structural steel shapes.

2.06 PURLIN AND GIRTS

- A. Purlins shall be roll-formed 6", 8", 10" or 12" deep "Z" sections, with stiffened flanges. The sections shall be formed so as to permit nesting when making overlapping continuous connections. Girts shall be rolled-formed "Z" sections or cold-formed "C" sections.

2.07 EAVE STRUTS

- A. Eave struts shall be a "C" section formed so as to provide adequate backup for both roof and wall panels at the building eave.

2.08 WIND BRACING

- A. Wind bracing shall consist of diagonal rod bracing and shall be provided in both roof and sidewall. Double roof purlins shall be provided between the rigid frames at all points of attachment of diagonal roof bracing. Fixed bracing may be used in lieu of sidewall rod bracing.
- B. The front side of the Material Storage Facility shall remain open with no bracing.
- C. The Wash Station shall be designed with moment connections and shall not require bracing.

2.09 FLANGE BRACING

- A. The inside flange bracing of all rigid frames shall be braced laterally so that the allowable compressive stress is adequate for any combination of loading.

2.010 SILL SUPPORT

- A. A continuous member shall be provided to which the base of the wall covering may be attached. This member shall be a galvanized member as supplied by the manufacturer.

2.011 FRAMED OPENINGS

- A. Structural framing members for all openings shall be adequate for the specified design loads.

2.012 COATINGS

- A. All primary and secondary structural framing members shall be galvanized. See Section 09905 for coating of structural steel.

2.013 ROOF AND WALL COVERING

- A. Roof Panels:
 - B. Varco Pruden SLR II, or equal
 - C. Color: Cool Egyptian White
- D. Wall Panels:
 - E. Varco Pruden Panel Rib, or equal
 - F. Color: Cool Sierra Tan
- G. Roof and wall coverings shall be engineered to meet a variety of needs while providing the protection, low maintenance, durability, longevity, aesthetic quality and load rating requirements.
- H. All panels are to be manufactured from galvanized steel conforming to ASTM Specification A-446 Grade D with galvanized coating conforming to ASTM Specification A525, G-90 coating class.
- I. The coating system shall be guaranteed for 20 years. The exterior paint finish shall consist of a baked-on epoxy base primer with a baked-on finish coat. Finish color shall be chosen during construction.
- J. Fasteners:
 - 1. All self-tapping sheet metal screws shall conform to ASA Standard B18.6 and shall have Type "A" threads. Where required for weather tightness, screws shall be equipped with metal and neoprene washers.
- K. Sealant and Closures:
 - 1. Sealant for sidelaps, endlaps and flashings shall be a gray pressure-sensitive tape which shall be a blend of butyl and EPDM rubbers, with not less than 50% butyl, and suitable inert fillers and pigments. The material shall be non-asphaltic, non-shrinking, nondrying, and non-toxic and shall have superior adhesion to metals, plastics and painted surfaces at

temperatures from -10 to 140 degrees F. The material shall have a flash point of at least 300 degrees F, and shall not flow at 200 degrees F.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. The Contractor shall examine all site conditions prior to erection.
 - 1. Do not proceed until all deficiencies are corrected.

3.02 PREPARATION

- A. Before receiving material, verify that the site is properly prepared with adequate safe storage and shake out areas.
- B. Prior to starting erection, field check foundation, dimensions and elevations for conformity to the following tolerances:
 - 1. Building width and length \pm 1/4-inch.
 - 2. Building diagonals \pm 1/2-inch.
 - 3. Out of level tolerance for concrete piers and walls \pm 1/8-inch in 20 feet-0 inches and \pm 1/4-inch over all.

3.03 INSTALLATION

- A. General:
 - 1. Erection Drawings: Detailed erection drawings referencing the building component part numbers shall be provided by the building manufacturer. All component parts or bundles of identified parts shall be marked with a part number for easy reference to the erection drawings. A Design Manual will be provided and will show the proper way to locate wall accessories.
 - 2. Erection of all metal building components and accessories shall conform to the building manufacturers' erection instructions and the manufacturers' design manual.
 - 3. Contractor shall be responsible for construction site safety and conformity to all applicable environmental and safety laws, regulations and ordinances covered by this section.
 - 4. All Work shall be performed in a neat and workman like manner.
 - 5. Provide access to the work as scheduled for owner provided inspections, as required.
 - 6. Erect in accordance with manufacturer's instructions.
 - 7. All parts level, plumb, and aligned to within 1 in 500.
 - 8. Install and tighten fasteners in all connections.
 - 9. Tighten structural bolts by the turn of the nut method per the AISC Manual, unless Building Manufacturer requires another method.
 - 10. Carefully level and grout all posts, columns and frames in place.
 - 11. Seal sill angles and door frames with caulk.
 - 12. Install and seal roof coverings and flashings for watertight construction:
 - a. Lap all joints.

- b. Seal with nondrying sealant.
 - 13. Paint unfinished or shop primed surfaces with two coats of alkyd enamel.
 - 14. Clean, prime, and paint field welds to match adjacent surfaces.
- B. Erection Sequence Notes:
- 1. Coordinate sequencing of metal building superstructure erection in accordance with the pre-engineered building supplier's recommendations.
 - 2. Protect finish painted columns and other structural members.
- C. Structural Framing:
- 1. Erect load bearing walls and other structural material true, plumb and square as shown in the building manufacturers' erection instructions.
 - 2. The erector shall furnish temporary falsework, cribbing, guys and bracing where needed for squaring, plumbing, and securing the structural members against loads, such as wind loads acting on the exposed framing and seismic forces, as well as loads due to erection equipment and erection operations.
 - 3. The structure will not be able to carry loads until all structural framing is complete.
 - 4. Install framing in accordance with MBMA Low Rise Building Systems Manual, Common Industry Practices.
- D. Covering:
- 1. Coated material shall not be cut with flame or abrasive cutters.
 - 2. Erect roof and wall covering and flashing true, plumb and square according to the building manufacturers' erection instructions.
 - 3. Give special attention to caulking details.
- E. Accessories:
- 1. Follow all manufacturers' detail drawings and instructions for installing manufacturer supplied accessories.
 - 2. For builder supplied accessories, use only manufacturer approved details for the installation of materials used to penetrate material.

3.04 FIELD QUALITY CONTROL

- A. Touch up abrasions, marks, skips or other defects in shop-primed or factory finished painted surfaces with the same coating material used by the building manufacturer.

3.05 CLEANING

- A. Clean excess sealant from roof and other areas as work progresses to prevent tracking and maintain a good quality appearance.
- B. Remove all metal shavings from roof, wall and trim areas daily to prevent rust streaks.
- C. Remove from the site all scraps and debris left or caused by the work of this section.

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- D. Repaint any surfaces abraded or damaged during construction or remove and replace as directed by the engineer.
- E. Remove and replace any damaged wall or roof panels, frames, etc., as directed by engineer.
- F. Clean Any Soiled Surfaces.

END OF SECTION

SECTION 15060

PIPE AND PIPE FITTINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. All piping not covered in specific sections of the specifications.
2. Provide piping complete with all fittings, gaskets, jointing materials, supports, saddles, anchors, and necessary appurtenances.
3. Miscellaneous accessories and items.

B. Related sections:

1. Related Work specified elsewhere:
 - a. Earthwork: Section 02200
 - b. Metal Fabrications: Section 05501
 - c. Painting: Section 09905
 - d. Steel Pipe: Section 15061
 - e. Ductile Iron Pipe: Section 15062
 - f. Valves, Cocks, Hydrants, and Accessories: Section 15100

1.02 REFERENCES

A. Referenced standards:

1. ANSI/AWWA C602: Standard for Cement-Mortar Lining of Water Pipelines 4 inches and Larger - in Place.
2. ANSI/AWWA C651: Standard for Disinfecting Water Mains.
3. AWWA M11: Steel Pipe - A Guide for Design and Installation Manual.
4. ASTM A53: Standard Specifications for Pipe – Steel, Black Iron, Hot-Dipped, Zinc Coated, Welded and Seamless.
5. ASTM A307: Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi tensile strength.
6. ASTM D297: Standard Test Methods for Rubber Products - Chemical Analysis.
7. ASTM D395: Standard Test Methods for Rubber Property - Compression Set.
8. ASTM D412: Standard Test Methods for Rubber Properties in Tension.
9. ASTM D2240: Standard Test Methods for Rubber Properties - Durometer Hardness.
10. ASTM D1330: Rubber Flange Gaskets Grade I.
11. ANSI B.16.18-84: Cast Copper Alloy Solder-Joint Pressure Fittings.
12. ANSI B16.22-86: Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
13. ASTM B447-88: Standard Specification for Welded Copper Tube.
14. ASTM B642-88: Welded Copper Alloy USNS No. C21000 Water Tube.

B. Requirements of regulatory agencies:

1. In accordance with all municipal codes and ordinances, laws and regulations of the State.
2. In case of apparent conflict, State and local requirements govern over these specifications.
3. In absence of State and local regulations, National Plumbing Code applies.

1.03 SUBMITTALS

A. Product Data and Shop Drawings:

1. Sufficient data to verify compliance with the specifications.
2. Shop Drawing showing dimensions, sizes, location.
3. Detailed Shop Drawings for all pipe 4-inch size and larger.
4. Schematic Shop Drawings for all pipe under 4 inches in size.
5. Product Data: Describe materials, pipe, fittings, and gaskets.
6. Manufacturer's published installation instructions.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Packing and shipping:

1. To ensure undamaged condition.
2. Use wide bearing area slings and wide padded skids.
3. Do not use bare cables, chains, hooks, metal bars, or narrow skids.
4. Support on padded saddles not less than 12 inches wide.
5. Laterally support ends of pipe, fittings, and specials to maintain shape.
6. Separate materials so they do not bear against each other.
7. Securely fasten load to prevent movement in transit.

B. Acceptance at site:

1. Reject products with dents, kinks, abrupt changes of curvature or other injuries.
2. Reject any products dropped from truck or crane.
3. Replace or recondition at Contractor's expense rejected items.
4. Reconditioning subject to Engineer's acceptance.
5. Replace coatings as originally specified on reconditioned pipe.

1.05 PROJECT/SITE CONDITIONS

A. Environmental requirements: See Specification Section 02 00 00

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable manufacturers are shown under Section 2.02, Materials, for the various types of pipe, and pipe fittings.

2.02 GALVANIZED STEEL PIPE, 4 INCHES AND SMALLER:

A. Pipe: ASTM A53, Standard Weight, or FS WW-P-406 Weight A.

- B. Threaded or groove-joint connections.
- C. Fittings: Malleable iron ANSI B16.3 or FS WW-P-521, Type II, galvanized.
- D. Companion flanges, galvanized to match equipment connection.
- E. Unions:
 - 1. Malleable iron: FS WW-U-531, Class 2, Type B.
 - 2. Forged steel: Tongue and groove flange-type with non-metallic gaskets.

2.03 POLYVINYL CHLORIDE (PVC) PIPE:

- A. Water service:
 - 1. Pipe: ASTM D1785, Schedule 80, PVC 1120, with NSF seal.
 - a. Pipe and Fittings: Extruded from Type I, Grade 1, Class 12454 B material in accordance with ASTM D 1784.
 - 2. Fittings: ASTM D2464 or D2467, PVC Type I.
 - 3. Acceptable manufacturers:
 - a. Chemtrol.
 - b. Harvel Plastics.
 - c. Certainteed Pipe.
 - d. M&T Plastics.
 - e. Or equal.
 - 4. Flanges: Diameter and drilling per ANSI B16.5, 150 lb.
 - 5. Unions:
 - a. Unions 2 1/2 Inches and Smaller: Socket end screwed.
 - b. Unions 3 inches and larger: Socket flanges with 1/8 inch full face soft gasket compatible with chemical service. For general usage (non-chemical), use neoprene gaskets.
 - 6. Water Service:
 - a. Flange bolts and nuts: ASTM A307, Grade B, galvanized unless specified otherwise, install such that after installation bolts will project 1/8-inch to 3/8-inch beyond outer face of nut.
 - b. Flanged bolts and nuts shall be Type 316 stainless steel for the following conditions:
 - 1) Submerged in water or wastewater.
 - 2) In an enclosed space above wastewater.
 - 3) Buried.
 - c. Flange gaskets: Full face, 1/8-inch thick, neoprene or plasticized PVC.
 - d. Expansion joints: Belmont "Style 3915," Resistoflex "Style R6905," molded expansion joint, or equal.
 - 7. Solvent Cement: In accordance with ASTM D 2564.

2.04 PVC GRAVITY SEWER (SDR) PIPE:

- A. Sewer services.
- B. Pipe: ASTM D3034-SDR35.
- C. Joints: Integral bell and spigot with elastomeric gasket.

D. Acceptable manufacturers:

1. Certainteed, Fluidtite IB.
2. J-M Pipe, Ring-Tite.
3. PW Pipe, Twinseal.
4. Or equal.

2.05 MATERIALS

A. Pipe accessories:

1. Modular, rubber, sealing elements:
 - a. Thunder Line Corporation, "Link Seal," or equal.
2. Thread tape: Teflon;
 - a. John Crane "Thread Tape,"
 - b. Garlock Plasti-Thread,"
 - c. Hoke "EZ Seal"
 - d. or equal.
3. Protective coatings:
 - a. Tape wrap:
 - 1) FS HH-T-30 Coal Tar Base;
 - 2) Protecto Wrap "200,"
 - 3) Tapecoat "CT,"
 - 4) or equal.
 - b. Coal tar coating: MIL-C-18480;
 - 1) Kop Coat "Bitumastic No. 50,"
 - 2) Tnemec "46H-413 Tneme-Tar,"
 - 3) or equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Install where indicated on Drawings.
2. Provide unions where required for equipment removal, indicated on the Drawing or specified.
3. Do not install piping to obstruct openings and passageways.
4. Cut pipe to measurement taken at the site, not from the Drawings.
5. Provide taps for pressure-gauge connections with a nipple, snubber, and gauge cock where indicated on Drawings.
6. Slope drain piping a minimum of 1/4 inch per foot.

B. Joints:

1. Make pipe joints carefully and neatly.
2. Threaded:
 - a. ANSI B2.1, NPT fully and cleanly cut with sharp dies.
 - b. No more than three (3) threads exposed after installation.
 - c. Ream pipe ends after threading to remove burrs.

- d. Apply thread tape to joints in all plastic and stainless steel piping.
- e. Apply thread tape or joint compound to joints in other piping.
- 3. Compression:
 - a. Cut pipe ends squarely, remove burrs.
 - b. Scratches or grooves in tubing are not allowed.
- 4. Flared:
 - a. Cut tubing ends squarely; remove burrs.
 - b. Scratches or grooves in flared ends are not allowed.
- 5. Bell and spigot:
 - a. Install as recommended by manufacturer.
 - b. 12 inches and smaller outlets, where minimum line is at least twice the diameter of the branch; tee or a tapping saddle is acceptable.
 - c. Mark the centerline of each flange and mechanical joint piece on ductile iron pipe.
 - d. Finish machine pipe ends and flange faces flat and perpendicular to pipe centerline in a single operation on ductile iron pipe.
- 6. Flanged: Tighten bolts sufficiently to slightly compress gasket in accordance with manufacturer's instructions, but not so tight as to distort flanges.
- 7. Welded: ANSI B31.1 and per "Code for Pressure Piping."
- 8. Joint deflection on DIP: One-half allowed by manufacturer.

C. Protective coating:

- 1. Tape-wrap buried steel and galvanized pipe, including joints.
- 2. Half-lap tape wrapping, minimum 20 mils thickness.
- 3. DO NOT install polyethylene encasement on ductile iron pipe.
- 4. Apply one (1) coat of coal tar paint to joints in buried steel piping.
- 5. Paint exposed threads of submerged piping with zinc-rich paint.

D. Pipe supports:

- 1. Provide adequate pipe supports for all piping.
- 2. Utilize pipe supports as shown on the pipe support details.
- 3. Provide pipe supports at locations shown on the plans, as well as additional supports required to meet these maximum spacings:
 - a. Maximum pipe support for PVC pipe:

<u>Pipe Size</u>	<u>Maximum Spacing</u>
1" or less	4'-0"
1-1/4" - 2"	6'-0"
2-1/2" - 3"	7'-0"
3-1/2" & larger	8'-0"
Or as noted on the drawings	

- 4. Maximum pipe support spacing for miscellaneous metallic piping:

<u>Pipe Size</u>	<u>Maximum Spacing</u>
1" or less	5'-0"
1" & larger	7'-0"

E. Hydrostatic testing (pressure pipe):

1. Hydrostatically pressure test pipe per ANSI/AWWA C600, Section 4.
2. Pressure and leakage test:
 - a. Test restrictions;
 - 1) Test pressure shall not be less than 1.5 times the working pressure at the highest point along the test section.
 - 2) Test pressure shall not exceed pipe or thrust-restraint design pressures.
 - 3) The hydrostatic test shall be of at least 2-hour duration.
 - 4) Test pressure shall not vary by more than ± 5 psi for the duration of the test.
 - 5) Valves shall not be operated in either direction at differential pressure exceeding the rated valve working pressure.
 - 6) Valves can then be opened enough to equalize the trapped pressure with the line pressure, or fully opened if desired.
 - 7) Provide an independent valve to reduce the line pressure to the rated valve pressure on completion of the test.
 - 8) Test pressure shall not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed resilient-seated gate valves or butterfly valves.
 - b. Pressurization:
 - 1) All newly laid pipe or any valved section thereof shall be subjected to a hydrostatic pressure of at least 1.5 times the working pressure at the point of testing.
 - 2) Each valved section of pipe shall be slowly filled with water, and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge.
 - 3) Test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Owner.
 - 4) Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure.
 - 5) Allow the system to stabilize at the test pressure before conducting the leakage test.
 - c. Air removal:
 - 1) Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants.
 - 2) If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water.
 - 3) After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied.
 - 4) At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the Owner.

- d. Examination:
 - 1) Any exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test.
 - 2) Any damaged or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until it is satisfactory to the Owner.
 - e. Leakage defined:
 - 1) Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the air has been expelled for the specified 2-hour test duration.
 - f. Allowable leakage: None
- F. Air test for gravity drains (4-12 inch):
- 1. Mandrel test: After completion of the drain line, the line shall be cleaned and flushed by pulling a sewer ball through just prior to pulling the mandrel through.
 - 2. A commercially manufactured, rigid, odd-numbering leg (9 legs minimum) mandrel, with a circular cross section having a diameter of at least 95 percent of the specified average inside diameter, shall be pulled through the pipe by hand. The minimum length of the mandrel shall be equal to the nominal diameter of the pipe. Obstructions encountered by the mandrel shall be corrected by the Contractor.
 - 3. Air test: After the mandrel test, each section of drain between successive manholes shall be air tested as follows:
 - a. With all outlets plugged, air shall be slowly added until the internal pressure is raised to 4.0 pounds per square inch gauge (psig). The compressor used to add air to the pipe shall have a blowoff valve set at 5 psig to ensure that at no time the internal pressure in the pipe exceeds 5 psig.
 - b. The internal pressure of 4 psig shall be maintained for at least two (2) minutes to allow the air temperature to stabilize, after which the air supply shall be disconnected and the pressure allowed to decrease to 3.5 psig.
 - c. The time in minutes that is required for the internal air pressure to drop from 3.5 psig to 3.0 psig shall be measured. The results shall not be less than the minimum permissible duration for the air test pressure drop shown in Table 1.

Table 1. Minimum Time for Air Pressure Drop of 0.5 psig.

Pipe Diameter (in)	Time for Length Shown in Minutes/Seconds				
	0-200'	201-250'	251-300'	301-350'	351-400'
4-6	2:50	2:50	2:50	2:50	2:50
8	3:50	3:50	3:50	3:50	4:30
10	4:40	5:00	6:00	7:00	7:50
12	5:40	7:10	8:30	10:00	11:20

- d. Should groundwater be present above the flowline of the pipe, the air pressure added to the 3.5 psig criteria shall be calculated by dividing the vertical height, in feet of groundwater above the flowline, by 2.31. The starting test pressure shall not exceed 9.0 psig.
- e. If the time shown in Table 1 for the designated pipe size and length elapses before the air pressure drops 0.5 psig; the section being tested shall be passed and the test discontinued.

3.02 FIELD QUALITY CONTROL

- A. Test each line at the Contractor’s expense in the presence and to the satisfaction of Engineer.
- B. Provide all testing equipment, materials, tools, appliances and devices, and labor.
- C. Leaks:
 - 1. Make all joints and seams watertight and free of leaks.
 - 2. Inspect all exposed shop- and field-welded seams.
 - 3. Mark leaks clearly.
 - 4. Repair all visible leaks on exposed piping.
 - 5. Do not remove marks until leak is corrected.
 - 6. Repair welded joints by chipping out defective parts and re-welding.
 - 7. Do not hammer welds.
 - 8. Repair at Contractor’s expense leaks discovered within one (1) year after final acceptance by Owner.

3.03 CLEANING

- A. General:
 - 1. The inside of all pipe, valves, and fittings shall be smooth, clean, and free from blisters, loose mill scale, sand, and dirt when erected.
 - 2. Flush all lines prior to placing into service or prior to tie-in.

END OF SECTION

SECTION 15062

DUCTILE IRON PIPING

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Provide ductile iron piping complete with all fittings, jointing materials, pipe hangers and supports, anchors, blocking, and other necessary appurtenances.

1.02 REFERENCES

A. Reference standards:

1. ANSI/AWWA C104/A21.4: Standard for Cement Mortar Lining for Ductile Iron Pipe and Fitting for Water.
2. ANSI/AWWA C105/A21.5: Standard for Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids.
3. ANSI/AWWA C110/A21.10: Standard for Ductile Iron and Gray Iron Fittings, 3-In. Through 48-In., for Water and Other Liquids.
4. ANSI/AWWA C111/A21.11: Standard for Rubber Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. ANSI/AWWA C115/A21.15: Standard for Flanged Ductile-Iron Pipe with Threaded Flanges.
6. ANSI/AWWA C150/A21.50: Standard for Thickness of Ductile-Iron Pipe.
7. ANSI/AWWA C151/A21.51: Standard for Ductile Iron Pipe, Centrifugally Cast, for Water and Other Liquids.
8. ANSI/AWWA C153/A21.53: Standard for Ductile Iron Compact Fittings 3-In. through 16-In. for Water and Other Liquids.
9. ANSI/AWWA C600: Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.
10. ASME/ANSI B16.1: Cast Iron Pipe Flanges and Flanged Fittings.
11. ASTM A48: Standard Specification for Gray Iron Castings.
12. ASTM A377: Standard Index of Specification for Ductile-Iron Pressure Pipe.
13. ASTM A536: Standard Specification for Ductile-Iron Castings.
14. ASTM C150: Standard Specification for Portland Cement.
15. ASTM D1248: Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.
16. ASTM D395-89 Method B: Standard Test Method for Rubber Property - Compression Set.
17. ASTM D412-87: Standard Test Method for Rubber Properties in Tension.
18. ASTM D2240-86: Standard Test Method for Rubber Properties - Durometer Hardness.
19. ASTM A307: Standard Specification for Carbon Steel Bolts and Studs.

1.03 SUBMITTALS

- A. Product Data and Shop Drawings:
 - 1. Material specification data.
 - 2. Detailed Pipe layout Drawings.
 - 3. Installation instructions.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. During loading, transporting, unloading and storage, prevent damage to material.
 - 1. To ensure undamaged condition.
 - 2. Use wide bearing area slings and wide padded skids.
 - 3. Do not use bare cables, chains, hooks, metal bars, or narrow skids.
 - 4. Laterally support pipe, fittings, and specials to maintain shape.
 - 5. Separate materials so they do not bear against each other.
 - 6. Securely fasten load to prevent movement in transit.
- B. Do not drop pipe or fittings.
- C. Adequately tag or otherwise mark all piping and fittings as to size.
- D. Acceptance at site:
 - 1. Reject products with dents, kinks, abrupt changes of curvature or other injuries.
 - 2. Reject any product dropped from truck or crane.
 - 3. Replace or recondition at Contractor's expense rejected items.
 - 4. Reconditioning subject to Engineer's acceptance.
 - 5. Replace coatings as originally specified on reconditioned pipe.

1.05 PROJECT/SITE CONDITIONS

- A. Environmental requirements: See specification Section 02000

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable manufacturers:
 - 1. U.S. Pipe and Foundry Co.
 - 2. Pacific States.
 - 3. Or equal.
- B. Manufacturers for fittings, joints, and couplings are listed with the specific materials in Section 2.02, Materials.

2.02 MATERIALS

- A. Pipe:
 - 1. Ductile iron: ANSI/AWWA C151/A21.51 - Classified as listed below:

- a. 12 inches and below: Pressure Class 350.
- b. 24 inches and above: Pressure Class 250.
- c. All pipe burial depth greater than 15 feet below finished grade: Pressure Class 350.

B. Fittings:

1. Ductile iron: ANSI/AWWA C110/A21.10 dimensions, ASTM A536 Grade 80-60-03 or 70-50-05. ANSI/AWWA C153 fittings are allowed.

C. Joints:

1. Mechanical joints: ANSI/AWWA C111/A21.11.
2. Mechanical joints with tie rods:
 - a. Tie rods: ASTM A307.
 - b. Steel pipe spacers: ASTM A120, standard weight.
 - c. Washers: ANSI A27.2 plain steel.
 - d. Plastic plugs: As recommended by pipe manufacturer.
3. Flanged joints:
 - a. Flanges:
 - 1) General use: ANSI A21.15 or ASME/ANSI/B16.1, 125 lb.
 - b. Bolts: ASTM A307, chamfered or rounded ends projecting 1/4-inch to 1/2-inch beyond outer face of nut, unless otherwise specified.
 - c. Nuts: ASTM A307, hexagonal, ANSI B18.2, heavy semi-finished pattern, unless otherwise specified.
 - d. Flanged bolts and nuts shall be type 316 stainless steel for the following conditions:
 - 1) Submerged in water or wastewater.
 - 2) In an enclosed space above wastewater.
 - 3) Buried.
 - e. Gaskets: Full face, 1/8-inch thick, cloth impregnated, Garlock Blue-Guard Style 3300, or equal.
4. Threaded connections: ANSI B2.1 NPT; provide service saddles at all tapped connections.
5. Flexible couplings:
 - a. Dresser Style 38 or 138, Smith-Blair 411, Straub Flex, or equal.
 - b. Couplings shall have stainless steel nuts, bolts, and washers.
6. Grooved couplings: Per AWWA C606.
 - a. Coupling: Victaulic Style 77 or equal.
7. Restrained joint:
 - a. U.S. Pipe, Field-Lok gasket, or equal.
 - b. U.S. Pipe, T-R Flex, or equal.
8. Flanged coupling adapters:
 - a. 12 inches and under: Smith-Blair Type 912, Dresser Style 127, or equal, with anchor studs and stainless steel nuts, bolts, and washers.
 - b. 14 inches and over: Smith-Blair Type 913, Dresser Style 128, or equal.
9. Service saddles: Ductile iron with double galvanized steel straps and rubber sealing gasket, 250 psi pressure rating, stainless steel nuts, bolts,

and washers.

10. Restrained flange adapters:

- a. EBAA Iron 2100 Megaflange or as shown on the plans or equal.

D. Corrosion control:

1. Shop lining and coating:

- a. Lining: Mortar, NSF 61 approved
- b. Rust-preventative compound: Houghton "Rust Veto 344," Rust-Oleum "R-9."
- c. Bituminous coating per ANSI/AWWA C104/A21.4.

2.03 FABRICATION

A. Joints:

1. Type:

- a. Buried: Mechanical or push-on.
- b. Exposed: Flanged or Grooved.
- c. Other: As noted on Drawings.

2. 12 inches and smaller outlets, where main line is at least twice the diameter of the branch; tee or a tapping saddle is acceptable.

3. Where tie rods are required, except as indicated on Drawings provide:

- a. 14 inches and below: Two (2) rods.
- b. 16 inches through 20 inches: Four (4) rods.
- c. 24 inches through 30 inches: Six (6) rods.
- d. 36 inches through 48 inches: Eight (8) rods.

4. Mark the centerline of each flange and mechanical joint piece.

5. Screw flanges onto screwed-on flanged pipe so that pipe extends completely through and flush with the flange.

6. Finish machine pipe ends and flange faces flat and perpendicular to pipe centerline in a single operation.

7. Wall castings:

- a. Mechanical joint with tapped bolt holes except where indicated otherwise on the Drawings.
- b. Provide seep ring.
- c. Provide plastic plugs to prevent bolt holes filling with concrete.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine areas for:

1. Defects such as weak structural components that adversely affect execution and quality Work.
2. Deviations beyond allowable tolerances for piping clearances.

B. Start installation only when conditions are satisfactory.

C. Pipe:

1. Carefully examine pipe and fittings for cracks and other defects prior to

installation.

2. Remove all defective pipe from site and replace.

3.02 INSTALLATION

A. Cutting pipe:

1. Cut pipe neatly without damage to pipe or cement lining.
2. Cut smooth, straight, and at right angles to pipe axis.
3. Dress and bevel end of cut pipe to remove roughness and sharp corners.
4. Cut cast iron with mechanical pipe cutters.
5. Cut ductile iron pipe with saw or abrasive wheel.

B. Cleaning:

1. Thoroughly clean pipe and fittings of foreign matter before installation.
2. Keep pipe and fittings clean until final acceptance.
3. Joint contact surfaces:
 - a. Wire brush, if necessary.
 - b. Wipe clean.
 - c. Keep clean until jointing is complete.

C. Piping in buildings or structures:

1. Completed installation should present a neat, orderly appearance.
2. Do not block openings, passageways, or pipe galleries.
3. Run piping parallel to walls of building or structure.
4. Keep piping from contacting walls, structures or installed items.

D. Piping underground:

1. Install in accordance with AWWA C600, except as specified herein.
2. Protect from lateral displacement while placing backfill.
3. Embedment and backfill per Earthwork Section.
4. Do not lay pipe:
 - a. In water.
 - b. Under unsuitable weather conditions.
 - c. Under unsuitable trench conditions.

E. Jointing:

1. Restrained joints: At all locations on pressure piping and provide sufficient number of restrained joints on either side of bends or fittings in order to develop full thrust restraint at test pressure for gravity piping.
2. Follow manufacturer's instructions.
3. Below Grade: Mechanical joints
 - a. If an effective seal is not obtained, disassemble joint, clean thoroughly, and reassemble.
 - b. Do not over-tighten bolts to compensate for poor installation.
 - c. Carefully align holes in mechanical joints with tie rods to permit installation of the harness bolts.

- d. Install flange and mechanical joint pieces so the mechanical joint holes, as well as the flange holes, straddle the top centerline for horizontal piping or the side centerline for vertical piping.
 - e. Restrain all joints on pressure pipe unless indicate otherwise on the Drawings.
4. Above Grade: Flanged joints
- a. Take care when bolting flanges to ensure that there is no restraint on the opposite end of the pipe which would prevent gasket compression or cause unnecessary stress in flanges.
 - b. Leave one (1) flange free to move in any direction while tightening flange bolts.
 - c. Tighten bolts gradually at a uniform rate to compress gaskets uniformly.
 - d. Take special care in connecting to pumping equipment to ensure no stresses are transmitted to pump flanges by connecting piping.
 - 1) Permanently support piping for accurate matching of bolt holes and uniform contact over the entire face of abutting pump and pipe flanges are obtained before bolting those flanges.
 - 2) Allow pump connection piping to move parallel to its longitudinal centerline while bolts are tightened.
 - 3) Level, align, and wedge pipes into position to fit connecting piping; but, do not install grout until after initial pipe fitting and alignment to allow shifting the pump on its foundation.
 - 4) Grout pumps prior to final bolting of connecting piping.
5. Mechanical couplings:
- a. Cut pipe ends clean and smooth.
 - b. Leave a space of 1/2-inch between pipe ends.
 - c. Restrain all couplings on pressure pipe unless indicate otherwise on the Drawings.
6. Wall castings: Provide where indicated on the Drawings.
- F. Reducers:
- 1. Provide eccentric reducers.
 - 2. Install with straight side on top to avoid trapping air.
- G. Anchorage:
- 1. In interior locations and where subject to internal pressure anchor or harness piping with mechanically coupled or similar joints to prevent separation of joints.
 - 2. Other location: Provide reaction blocking anchorages or other supports for fittings above grade or exposed in structure as indicated on the Drawings or as required to prevent movement.
 - 3. Concrete blocking:
 - a. Bearing area as indicated on the Drawings, or as directed by the Engineer.
 - b. Extend from fitting to solid undisturbed earth.
 - c. Install so joints are accessible for repair.

- d. If adequate support against undisturbed earth cannot be obtained, provide restrained joints or metal harness anchorages across the joint and secure by anchoring to the pipes or fittings or other anchorage facilities as required for adequate support.
- e. If the lack of a solid vertical excavation face is due to improper excavation, all excess costs shall be borne by Contractor.

H. Encasement:

1. Provide concrete encasement as indicated on the Drawings.
2. Provide concrete encasement under all buildings to a distance of five (5) feet outside of the footing.
3. Suitably support and block pipe and anchor against flotation.

I. Connection to existing pipelines:

1. Make connections between new and existing piping with suitable fittings.
2. Schedule connection to minimize inconvenience to the Owner.
3. Contractor shall dewater existing piping.
4. The District shall operate all existing valves.
5. Provide facilities for adequate dewatering and disposal of water from dewatered line and excavations without damage to adjacent property.

J. Corrosion control:

1. Metal surfaces:
 - a. Coat all steel clamp rods, bolts, and other metal accessories used in tapping saddles, anchorages or joint harnesses subject to submergence or contact with the earth and not concrete-encased.
 - b. Apply two (2) coats of coal-tar paint to clean, dry, metal surfaces.
 - c. Allow the first coat to dry and harden before applying the second coat.

K. Alignment:

1. Unless shown otherwise, piping shall be installed parallel to building lines, plumb, and level.
2. Piping shall be installed without springing or forcing the pipe in a manner which would set up stresses in the pipe, valves, or connected equipment.
3. All pipe flanges shall be set level, plumb, and aligned. All flanged fittings shall be true and perpendicular to the axis of the pipe. All bolt holes in flanges shall straddle vertical centerline of pipes.

3.03 FIELD QUALITY CONTROL

A. Hydrostatic tests:

1. Perform hydrostatic tests in accordance with Section 15060.

END OF SECTION

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SECTION 15100

VALVES, COCKS, HYDRANTS AND ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Valves, cocks, hydrants, and accessories, indicated on the Drawings specified or required for proper operation of equipment or systems.
2. Various mechanical accessories as required.

1.02 PREFERENCES

A. Reference standards:

1. ASTM A36: Steel.
2. ASTM A123: Galvanized Steel
3. ASTM A536, GR .65-45-12: Ductile Iron.

1.03 SUBMITTALS

- A. Annotated Product Bulletins for all valves, miscellaneous components, and accessories utilized.
- B. Installation, operating and maintenance manuals for all valves, miscellaneous components, and accessories utilized.
- C. Catalog data: Submit manufacturer's literature and illustrations sufficient to verify compliance with the specifications.
- D. Shop Drawings:
1. Dimensions.
 2. Construction details.
 3. Materials.
 4. Assembled weight.
 5. Schedule for all items included in this section.
- E. Installation instructions
- F. Maintenance data:
1. Maintenance instructions.
 2. Parts lists.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves and accessories for shipment according to manufacturer recommendations.
1. Seal valve ends to prevent entry of foreign matter into valve body.
 2. Box, crate, completely enclose, and protect valves and accessories from accumulations of foreign matter.

B. Storage and protection:

1. Store valves out of traffic.
2. Cover and protect as recommended by manufacturer.

1.05 PROJECT/SITE CONDITIONS

- A. Environmental requirements: See specification section 02000

PART 2 - PRODUCTS

2.01 MATERIALS

A. General:

1. Valve Boxes:
 - a. Provide valve boxes for all buried valves.
 - b. Provide per District Standard Detail VB_811.
2. Air Release Valves:
 - a. Provide per District Standard Detail AV_411-1.

B. Hose bibbs (1-1/2 inch):

1. Type:
 - a. Angle valve.
 - b. Outlet: Hose thread.
 - c. Inlet: FPT.
 - d. Bronze cap and chain.
 - e. Hand wheel.
2. Acceptable manufacturers:
 - a. Grainger Item# 6APG8
 - b. Or equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Install in accordance with the manufacturer's recommendation.
2. Provide a union or flanged connection within two (2) feet of each threaded end valve unless the valve can otherwise be easily removed from piping.

3.02 ADJUSTING

- A. Check and adjust for smooth operation in accordance with manufacturer's instructions.
- B. Warranty: Provide manufacturer's written warranty, issued in the Owner's name, to cover the equipment supplied against defects in workmanship and material for a period of one (1) year from the date of acceptance under normal use. Warranty shall include all materials and labor required.

END OF SECTION

SECTION 16010
ELECTRICAL

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall install, ready for use, the electrical system as specified herein and shown on the Contract drawings. This document describes the function and operation of the system and particular components, but does not necessarily describe all necessary devices. All components and devices shall be furnished and installed as necessary/required to provide a complete operable and reliable system for accomplishing the functions and meeting the performance set forth hereinafter.
- B. Furnish all required labor, materials, project equipment, tools, construction equipment, safety equipment, transportation, test equipment, incidentals, and services to provide a complete and operational electrical & instrumentation system as shown on the E - Series Drawings, included in these Specifications, or required for fully operating facility.
- C. The major areas in the scope of work shown on E - Series Contract Drawings which includes both the furnishing and installation are:
 - 3. Conduits and the field interconnection wiring between all equipment, lighting, receptacles, etc.
 - 4. Provide all necessary hardware, fittings, and devices to connect the designated equipment and wiring.
 - 5. Installation, mounting supports, interconnection drawings, wiring, start-up, testing and warranty for all equipment and systems.
 - 6. Provide trenching, backfilling, and compaction for all underground conduit routes, concrete pads, and pull boxes.
 - 7. Grounding system and equipment grounding.
 - 8. Remove and dispose of all excess dirt, paving, concrete, and other materials from site work.
- D. The following specifications incorporate specific equipment and devices that are standards of the Owner because of their serviceability, because of the local availability of labor, parts and materials, or because of the ability of the Owner to umbrella the equipment under existing maintenance contracts; however, favorable alternatives proposed in writing will be considered by the Owner.
- E. All electrical equipment and materials, including installation and testing, shall conform to the applicable codes and standards listed in this and other Sections. All electrical work shall conform with the National Electric Code (NEC) 2016 issue or applicable sections of the California Electric Code (CEC). Nothing on the Drawings or in the Specifications shall be construed to permit work or materials not conforming to these codes and standards.

1.02 CONTRACT DOCUMENTS

- A. The contract drawings and specifications are intended to be descriptive of the type of electrical system to be provided; any error, omission, or minor details missing in either shall not relieve the contractor from the obligations thereunder to install in correct detail any and all materials necessary for a complete operational system, at no additional cost.
- B. The Contract drawings are generally diagrammatic; exact locations of electrical products shall be verified in the field with the Engineer. Except where special details on drawings are used to illustrate the method of installation of a particular piece or type of equipment or materials, the requirements or descriptions in this Section shall take precedence in the event of conflict.
- C. Location at facilities of new equipment, inserts, anchors, panels, pull boxes, conduits, stub-ups, and fittings for the electrical system are to be determined by the Contractor and Engineer at time of installation. Contractor shall make minor adjustments to locations of electrical equipment required by existing conditions and coordination with other trades at no additional cost.
- D. The Contractor shall examine the architectural, mechanical, structural, electrical and instrumentation equipment provided under other Sections of this Contract in order to determine the exact routing and final terminations for all conduits and cables. The exact locations and routing of cables and conduits shall be governed by structural conditions, physical interferences, and the physical location of wire terminations on equipment. Conduits shall be stubbed up as near as possible to equipment.
- E. All equipment shall be installed and located so that it can be readily accessed for operation and maintenance. The Engineer reserves the right to require minor changes in location of equipment, without incurring any additional costs.
- F. Provide means to furnish equipment and accessories, do the installation, complete connections, submit documentation, perform start-up, and be responsible for the warranty.
- G. Where conduits are shown as "home runs" on the Contract drawings or stated to be furnished, but not explicitly shown as part of the scope of work; the Contractor shall provide all fittings, boxes, wiring, etc., as required for completion of the raceway system in compliance with the NEC and the applicable specifications in this Section.
- H. No changes from the Contract drawings or specifications shall be made without written approval of the Engineer. Should there be a need to deviate from the Contract documents, submit written details and reasons for all changes to the Engineer for favorable review.
- I. The resolution of conflicting interpretation of the Contract documents shall be as determined by the Engineer.

- J. It is the system suppliers responsibility for obtaining and instrumentation transmitter configuration software, manuals and disks necessary for the Contractor to program and configure the instrumentation transmitters.

1.03 SUBMITTAL AND DRAWING REQUIREMENTS

- A. Submit six (6) sets of shop documents and drawings for approval in accordance with this subsection and the Section 01330.
- B. All drawings shall be generated with a computer utilizing the AutoCAD. Standard preprinted drawings simply marked to indicate applicability to the Contract will not be acceptable. Drawings shall be prepared in a professional manner and shall have borders and a title block identifying the project, system, drawing number, drawing title, AutoCAD file name, project engineer, date, revisions, and type of drawing. Drawings shall be no smaller than 11" x 17" and printed with a laser jet printer or plotted in ink on vellum. The lettering shall be legible and no smaller than 0.075 inch in height. Diagrams shall carry a uniform and coordinated set of wire colors, wire numbers, and terminal block numbers. The shop drawings shall include:
 - 1. Electrical one or three line diagrams detailing all devices associated with the power distribution system. The following applicable information or data shall be shown on the one- or three- line diagram: location, size and amperage rating of bus; size and amperage rating of wire or cable; breaker ratings, number of poles, and frame sizes; fault interrupt ratings; ground size and connections; neutral size and connections; power fail and other protective devices; fuse size and type, starters; contactor size and overload range; motor full load amperage of submitted motor and horsepower; rating for miscellaneous loads; etc. Submit water heater, phase and full load amps provided for this project for verification of accuracy of submitted one line drawings.
 - 2. Enclosure and Elevation layout diagrams shall be provided to show all deadfront, front panel and backpan devices drawn to scale. Show fabrication methods and details; including material of construction, paint color, support and latching mechanisms, fans and ventilation system, and conduit entrance areas.
- C. The electrical submittals shall include but not be limited to data sheets and drawings for each product together with the technical bulletin or brochure. The electrical submittals shall include:
 - 1. Product (item) name used herein and on the Contract Drawings.
 - 2. The manufacturer's model or other designation.
 - 3. Tag name/number per the drawings, schedules, and indexes.
 - 4. Detailed electrical one or three line, elementary and loop diagrams showing all wiring requirements for each system.
 - 5. Complete catalog cuts with full description of equipment. General sales literature will not be acceptable. The part or model number with options to be provided shall be clearly identified. Where more than one item or catalog number appears on a catalog cut, the specific item(s) or catalog

- numbers(s) proposed shall be clearly identified.
6. Location of assembly at which it is installed.
 7. Range, size, and graduations as required.
 8. Physical size with dimensions and mounting details.
 9. Enclosure fabrication and color.
 10. Enclosure layout and elevation drawings to scale.
 11. Quantity and quality requirements for electric power.
 12. Materials of construction of components.
 13. Nameplate schedule.
 14. Bill of Materials: A complete Bill of Materials list shall be provided at the inside of the front cover. The Contractor shall provide Bill of Material for electrical components A separate set of Material Listing forms shall be provided for each control panel and another listing all field equipment. Generic names or part numbers used by a distributor or Systems House are not acceptable; originating manufacturer's name and part number shall be listed.
 15. Submit copies in PDF format.
- D. Shop documents and drawings shall be submitted for all devices and components in the electrical system.
- E. Exceptions to the Specifications or Drawings shall be clearly defined by the equipment supplier. Submittal data shall contain sufficient details so a proper evaluation may be made by the Engineer.
- F. The Contractor shall coordinate submittal with the work so that project will not be delayed. This coordination shall include scheduling the different categories of submittal, so that one will not be delayed for lack of coordination with another.
- G. No material or equipment shall be allowed at the job site until the submittal for such items has been reviewed by the Engineer and marked "No Exceptions Taken" or "Make Corrections Noted".
- H. The equipment specifications have prepared on the basis of the equipment first named in the Specifications. The Supplier shall note that the second named equipment, if given, is considered acceptable and equal equipment, but in some cases additional design, options, or modifications may be required, at no additional cost, to meet Specifications.
- I. The decision of the Engineer governs what is acceptable as a substitution. If the Engineer considers it necessary, tests to determine equality of the proposed substitution shall be made, at the Contractor's expense, by an unbiased laboratory that is satisfactory to the Engineer.
- J. Electrical submittals shall be complete giving all details of connections, wiring, instruments, enclosures, materials and dimensions. Standard sales literature will not be acceptable.
- K. Request for information (RFIs) shall not be included in submittals. RFIs shall be submitted separately with its individual submittal number.

1.04 COORDINATION

- A. The contractor shall coordinate the electrical work with the other trades, code authorities, utilities, and the engineer; with due regard to their work, towards promotion of a rapid completion of the project. If any cooperative work must be altered due to lack of proper supervision of such, or failure to make proper provisions, then the contractor shall bear expense of such changes as necessary to be made in the work of others.
- B. Manufacturer's directions and instructions shall be followed in all cases where such is not shown on the Contract Drawings or herein specified.
- C. The electrical modifications and additions are to be made at the operational Citrus Heights Corporation Yard. The Contractor shall schedule all the required work with the Owner, including each shutdown period. Each shutdown shall be implemented to minimize disruption of the existing operations. The work to be provided under this Contract shall not disrupt any of the existing operations without prior approval.
 - 16. The Contractor shall limit all unscheduled shutdown periods to less than 1 hour and only with prior approval of the Owner.
 - 17. Carry out scheduled shut downs only after the time, date, and sequence of work proposed to be accomplished during shutdown has been favorably reviewed by the Owner. Submit shutdown plans at least 72 hours in advance of when the scheduled shutdown is to occur.
 - 18. The Owner reserves the right to delay, change, or modify any shutdown at any time, at no additional cost to the Owner, when the risk of such a shutdown would jeopardize the operation of site.
- D. The Contractor shall cease work at any particular point, temporarily, and transfer his operations to such portions of work as directed, when in the judgment of the Engineer it is necessary to do so.

1.05 SUPERVISION

- A. The Contractor shall schedule all activities, manage all technical aspects of the project and attend all project meetings associated with this Section.
- B. The Contractor shall supervise all work in this Division, including the electrical system general construction work, from the beginning to completion and final acceptance.
- C. The Contractor shall supervise and coordinate all work in this Division to insure that each phase of the project, submittal, delivery, installation, and acceptance testing, etc., is completed within the allowable scheduled time frames.
- D. The Contractor shall be responsible for obtaining, preparing, completing, and furnishing all paper work for this Section, which shall include transmittals, submittal, forms, documents, manuals, instructions, and procedures.

1.06 INSPECTIONS

- A. All work or materials covered by the Contract documents shall be subject to inspection at any and all times by the Owner. If any material does not conform to the Contract documents, or does not have an "No Exceptions Taken" or "Make correction Noted" submittal status; then the Contractor shall, within three days after being notified by the Owner, remove the unacceptable material from the premises; and if said material has been installed, the entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the Contractor.
- B. Work shall not be closed in or covered over before inspection and approval by the Owner. All costs associated with uncovering and making repairs where non-inspected work has been performed shall be borne by the Contractor.
- C. The Contractor shall cooperate with the Owner and provide assistance for the inspection of the electrical system under this Contract. The Electrical Contractor shall remove covers, provide access, operate equipment, and perform other reasonable work which, in the opinion of the Engineer, will be necessary to determine the quality and adequacy of the work.

1.07 JOB CONDITIONS

- A. The Contractor shall make all arrangements and pay the costs thereof for temporary services required during construction of the project, such as temporary electrical power. Upon completion of the project, remove all temporary services, equipment, material and wiring from each site as the property of the Contractor.
- B. The Contractor shall provide adequate protection for all equipment and materials during shipment, storage and construction. Equipment and materials shall be completely covered with two layers of plastic and set on cribbing six inches above grade so that they are protected from weather, wind, dust, water, or construction operations. Equipment shall not be stored outdoors without the approval of the Owner. Where equipment is stored or installed in moist areas, such as unheated buildings, provide an acceptable means to prevent moisture damage, such as a uniformly distributed heat source to prevent condensation.
- C. The normal outdoor, not in direct sunlight, ambient temperature range of the job site will vary between 0 to 120 degrees Fahrenheit. All equipment shall be rated to operate in these temperature ranges or provisions for adequate heating and cooling shall be installed, at no additional cost to Owner.

1.08 MEASUREMENT AND PAYMENT

- A. No measurement will be made. Full compensation for conforming to these requirements, including all the labor, materials, tools, equipment, incidentals and for doing all the work involved in this section necessary for completion of the work, as shown on the Contract Plans, as specified in the Standard Specifications, these special provisions and as directed by the Engineer, shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed.

1.09 CHANGE ORDER PRICING

- A. All change order pricing by Contractor or System Supplier shall be broken out into the following minimum categories:
 - 1. Labor per hour listed per discipline, i.e. Engineer, Drafter, Estimator, Programmer, Secretarial, etc.
 - 2. Materials and equipment itemized per component and quantity.
 - 3. Rentals, travel, per diem, etc.
 - 4. Tax.
 - 5. Shipping.
 - 6. Overhead and profit.
- B. Lump sum change order pricing is not acceptable.
- C. If Contractor or System Supplier refuse to provide a change order with broken out pricing, the Engineer reserves the right to obtain independent estimates from other Contractors or System Suppliers. The Contractor or System Supplier who refused to provide the change order with broken out pricing, will be charged for the preparation of the independent estimates.

PART 2 – MATERIALS

2.01 QUALITY

- A. It is the intent of the Contract specifications and drawings to secure the highest quality in all materials and equipment in order to facilitate operation and maintenance of the facility. All equipment and materials shall be new and the products of reputable suppliers having adequate experience in the manufacture of these particular items. For uniformity, only one manufacturer will be accepted for each type of product.
- B. All equipment shall be designed for the service intended and shall be of rugged construction, of ample strength for all stresses which may occur during fabrication, transportation, erection, and continuous or intermittent operation. All equipment shall be adequately stayed and braced and anchored and shall be installed in a neat and workmanlike manner. Appearance and safety, as well as utility, shall be given consideration in the design of details. All components and devices installed shall be standard items of industrial grade, unless otherwise noted, and shall be of sturdy and durable construction suitable for long, trouble free service. Light duty, fragile and competitive grade devices of doubtful durability shall not be used.
- C. Products that are specified by manufacturer, trade name or catalog number established a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are favorably reviewed by the Engineer prior to installation.
- D. Underwriters Laboratories (UL) listing is required for all substituted equipment when such a listing is available for the first named equipment.
- E. When required by the Contract specifications or requested by the Engineer, the Contractor shall submit equipment or material samples for test or

evaluation. The samples shall be furnished with information as to their source and prepared in such quantities and sizes as may be required for proper examination and tests, with all freight and charges prepaid. All samples shall be submitted before shipment of the equipment or material to the job site and in ample time to permit the making of proper tests, analyses, examinations, rejections, and resubmissions before incorporated into the work.

2.02 NAMEPLATES AND TAGS

- A. Equipment Exterior Nameplates: Nameplate material shall be rigid laminated black phenolic with beveled edges and white lettering, except for caution, warning, and danger nameplates the color shall be red with white lettering. The size of the nameplate shall be as shown on the Drawings. No letters are allowed smaller than 3/16". All phenolic nameplates located outdoors shall be UV resistant. Securely fasten nameplates in place using two stainless steel screws if the nameplate is not an integral part of the device. Epoxy cement or glued on nameplates will not be acceptable.
1. Each major piece of electrical equipment and Control Panel shall have a manufacturer's nameplate showing the Contract specified name and number designation, the manufacturer's name, model designation, part number, serial number, and pertinent ratings such as voltage, amperage, # of phases, range, calibration, etc.
 2. For each device with a specific identity (pushbutton, indicator, field control station, disconnect switches, etc.) mounted on the exterior or deadfront of a piece of equipment, provide a nameplate with the "Equipment Name and Equipment Number" inscription as shown in the Contract Documents. Where no inscription is indicated in the Contract Documents, furnish nameplates with an appropriate inscription providing the name and number of device.
 3. For all receptacles and switches, provide a faceplate engraved or stamped with the panelboard and circuit number it is fed from. Also, include on faceplate or on a separate nameplate for each light switch identification use such as "OUTSIDE BUILDING LIGHTS", "PERIMETER LIGHTS", etc.
 4. All transformers and panelboards shall have nameplates with 1/2" high letters and be engraved with designations as shown on one-line Drawings.
 5. All safety and disconnect switches shall have nameplates with 1/2" high letters and be engraved with designations as shown on one-line drawings
- B. Engrave or machine print the tags with inscriptions as approved by the Engineer in the nameplate submittal.

2.03 WIRE

- A. This Section applies to all wires or conductors used internal for all electrical equipment or external for field wiring. All wires shall be properly fused or protected by a breaker at the amperage rating allowed by the NEC.
- B. Material - Wire shall be new, plainly marked with UL label, gauge, voltage, type of insulation, and manufacturer's name. All wire shall conform to the

following:

1. Conductors shall be copper, with a minimum of 98% conductivity.
2. Wire shall be Class B stranded.
3. Insulation of all conductors and cables shall be rated 600 volt.
4. Insulation type for conductors smaller than #6 AWG shall be moisture and heat resistant thermoplastic NEC Type THHN/THWN, rated 90 °C in dry locations and 75 °C in wet locations, or approved equal. Conductors #6 AWG and larger shall be XHHW insulation rated 90 °C in dry locations and 75 °C in wet locations.
5. Field wire minimum AWG sizes
 - a. #12 for wires used for individual conductor circuits 100 volt and above.
 - b. #14 for wires used for individual conductor circuits below 100 volt.
6. Nonfield or panel wire minimum AWG sizes if properly protected by fuse or breaker:
 - c. #14 for wires used for individual conductor circuits 100 volt and above.
 - d. #18 for wires used for individual conductor circuits below 100 volt and above if properly protected by fuse or breaker.

C. Wire Marking

1. Wire identification: All wire terminations including field interconnect as well as wiring interior pedestal, switchboard, panels, equipment, junction panels and boxes shall be identified with machine printed labels. Hand lettered labels are not acceptable and shall be replaced at the Contractor's expense. The wire identification code for all field interconnect and panel interior wiring, shall be similar to the designations shown on the Contract Drawings.
2. Wire Labels: The labels shall be machine printed with indelible ink, heat shrink type capable of accepting a minimum of 23 machine printed characters per sleeve label by Brady "Bradysleeve" or equal. Labeling shall be neatly installed for visibility and shall be clearly legible. Each wire and conductor shall be labeled with wire label as shown on approved loop, elementary and interconnect Drawings. Labels shall not be wrap around or snap-on type.
3. Where there is insufficient space for labels on locally interconnected neutral wires such as jumpers between adjacent auxiliary relay coil neutral terminals, these labels may be omitted. "Locally" is defined as wires no longer than 8".
4. Wire labels for lighting and receptacles shall be installed and consist of the panelboard and circuit number (i.e., Panelboard "LP100", circuit breaker #3 would have wire label line "LP100-L3" and neutral "LP100-N3").
5. All spare wires shall be labeled with equipment number followed by SP1, SP2, etc. (i.e. P11001-SP1 for first spare wire).
6. All control and signal wiring terminations shall have the correct wire label applied prior to making connection.
7. Label all conductors in pull boxes with circuit number. Bundle together in pull

- box.
8. Color code of all wire shall conform with the following table.

WIRES COLOR CODE TABLE

DESCRIPTION	PHASE/CODE LETTER	FIELD WIRE WIRE OR TAPE COLOR	NON-FIELD WIRE COLOR
480 V, 3 PHASE	A	BROWN	BROWN
	B	ORANGE	ORANGE
	C	YELLOW	YELLOW
240 V OR 208 V, 3P	A	BLACK	-
	B	RED (ORANGE IF HIGH LEG)	-
	C	BLUE	-
240 / 120 V, 1 P	L1	BLACK	BLACK
	L2	RED	-
12 V POSITIVE	12P	DARK BLUE	DARK BLUE
12 V NEGATIVE	12N	BLACK/RED STRIPE	BLACK/RED STRIPE
24 V POSITIVE	24P	PINK	PINK
24 V NEGATIVE	24N	BLACK	BLACK
AC CONTROL		VIOLET	RED (YELLOW FOR FOREIGN CIRCUITS)
DC CONTROL		LIGHT BLUE	LIGHT BLUE
NEUTRAL	N	WHITE	WHITE
GROUND	G	GREEN	GREEN
SHIELDED PAIR	+	RED	RED
	-	BLACK	BLACK

9. No other colors shall be used without prior approval of the Owner.
10. The same color shall be connected to the same phase throughout the

panel.

11. Phase color insulation shall be provided for complete exposed length of #8 wire or larger, colored phase tape is not allowed on #8 and smaller wire.

2.04 COMPONENTS

A. CIRCUIT BREAKERS

1. Circuit breakers shall be of the indicating type, providing ON, OFF and TRIPPED positions of the operating handle. Circuit breakers shall be quick-make, quick-break, with thermal-magnetic action, except when protecting motor feeders where motor circuit protector (MCP) breakers with adjustable magnetic trip shall be used. Circuit breakers shall be the bolted on type. The use of tandem or dual circuit breakers in a normal single-pole space to provide the number of poles or spaces specified are not acceptable. All multiple-pole circuit breakers shall be designed so that an overload on one pole automatically causes all poles to open. Circuit breakers and motor circuit protectors shall be manufactured by Cutler Hammer or approved equal.
2. Breakers shall be sized and have a minimum interrupting capacity as shown on Drawings and as required for the supplied equipment.

2.05 CONDUIT, RACEWAYS, AND WIREWAYS

A. General - Conduit, raceways, and wireways, wiring methods, materials, installation shall meet all requirements of the NEC, be UL labeled for the application, and meet the minimum following specifications.

1. All wiring shall be installed in conduits, raceways, or wireways when interconnecting equipment and devices.
2. The Contractor shall use special conduit, raceways, wireways, construction methods, and materials as shown on the Contract drawings; which shall take precedence over any general methods and materials specified in this Section.
3. The minimum size conduit shall be 3/4-inch unless indicated otherwise on the Drawings or for special connections to equipment. Buried, encased, or conduits located in walls shall be 1-inch minimum.
4. Conduit stubs for future use shall be capped with coupling, nipple, plug, and cap and each end identified with conduit labels.

B. Galvanized Rigid Steel Conduit (GRS)

1. Rigid steel conduit, couplings, bends and nipples shall be in accordance with ANSI C80.1 and UL-6.
2. Hotdip galvanized inside and outside after fabrication and then coated with a zinc bichromate finish.
3. Minimum trade size - three-quarters inch ($\frac{3}{4}$ ") unless otherwise shown on Contract Drawings.
4. Galvanized rigid steel factory elbows for indoor 90 degree transitions.
5. EMT or IMC is not considered an equivalent to GRS.
6. GRS conduit is to be used for outdoor, wash facility, and material storage

building surface mounted.

C. PVC Conduit (PVC-40 OR PVC-80)

1. Shall be high impact polyvinylchloride suitable for use underground, direct burial and for use with 90 C wires, and shall conform to UL 651. PVC conduits shall be UL listed and labeled for "direct" burial.
2. A copper bonding conductor shall be pulled in each raceway and bonded to equipment at each end with approved lugs.
3. PVC fittings shall have watertight solvent-weld-type conduit connections.
4. PVC conduit shall be stored on a flat surface and shielded from the sun.
5. PVC conduit shall not be used above grade.

2.06 WIRING DEVICES

A. Boxes

1. Device boxes shall be of zinc-galvanized steel type with shape and size best suited for the particular application, rated for the location installed, and shall be supported directly to structure by means of screws, anchors, or bolts.
2. Box dimensions shall be in accordance with size, quantity of conductors, and conduit clearances per NEC articles 370 requirements.
3. Boxes exposed to the weather or in moist locations shall be weatherproof (WP) PVC coated cast type with threaded hubs.

B. Switches

1. General purpose switches shall be manufactured in accordance with UL 20. Switches shall be one pole rated, 20 amps, at 277 VAC. Bodies shall be of ivory phenolic compound supported by mounting strap having plaster ears. Switches shall have copper alloy contact arm with silver cadmium oxide contacts. Switches shall have slotted terminal screws and a separate green grounding screw. Furnish Hubbell 1221, Leviton 1221, or approved equal.

C. Receptacles

1. All receptacles on this project are GFI (ground fault circuit interrupting) receptacles. GFI receptacles shall be duplex, 20A, 120V, with "test" and "reset" buttons with shallow design for mounting and standard screw terminals for direct wiring. Receptacles shall be designed, manufactured, and tested to prevent nuisance tripping from voltage spikes, RFI, EMI, or electronic component failures. Chaining multiple receptacles from one GFI unit is not acceptable. GFI receptacles shall be Leviton 6899, Arrow-Hart or approved equal.

D. Device Plates And Covers

1. General purpose device plates and covers shall be stainless steel. Plates or covers shall be attached with stainless steel screws. Circuit breaker number and panelboard name shall be stamped on each cover.
2. Weatherproof switch, outlet, and receptacle boxes shall be fitted with cast

aluminum gasketed covers rated for wet locations in accordance with NEC 410-57. Each access cover shall have a cover to maintain the weatherproof integrity even when a plug is connected to the receptacle. Screws and hinge springs shall be stainless steel. Weatherproof access covers shall be Hubbell, TayMac, Crouse-Hinds, or approved equal.

3. Receptacle & light switch plates shall be stamped or engraved as specified in section Nameplates and Tags.

2.07 GROUNDING SYSTEM

- A. Ground clamps shall be bolt-on type as manufactured by ILSCO type AGC, O-Z Gedney Type GRC, Burndy Type GAR or GP, or approved equal.
- B. All ground rod, pipe, and steel plate and buried bond connections shall be made by welding process equal to Cadweld.
- C. Ground buses shall be provided in all electrical enclosures. Each ground bus shall be sized as shown on the Contract drawings or specified herein. The ground bus shall be adequately sized for the connection of all grounding conductors required per NEC. Screw type lugs shall be provided on all ground busses for connection of grounding conductors.
- D. Each ground bus shall be copper. Screw type fasteners shall be provided on all ground busses for connection of grounding conductors. Ground bus shall be a Challenger GB series, ILSCO CAN series, or approved equal.
- E. Attachment of the grounding conductor to equipment or enclosures shall be by connectors specifically provided for grounding. Mounting, support, or bracing bolts shall not be used as an attachment point for ground conductors.
- F. All raceway systems, supports, enclosures, panels, and equipment housings shall be permanently and effectively grounded.
- G. One side of the secondary on all transformers shall be grounded.
- H. The system neutral (grounded conductor) shall be connected to the system's grounding conductor at only a single point in the system. This connection shall be made by a removable bonding jumper sized in accordance with the applicable provisions of the National Electrical Code if the size is not shown on the Drawings. The grounding of the system neutral shall be in the enclosure that houses the service entrance main over-current protection.
- I. The system neutral conductor and all equipment and devices required to be grounded by the National Electrical Code shall be grounded in a manner that satisfies the requirements of the National Code.
- J. Grounding conductors shall be sized as shown on the Plans or in accordance with NEC table 250-122, whichever is larger.
- K. Grounding and bonding wires shall be installed in all conduits and raceways and connected to the ground bus and all equipment.
- L. Conduit grounding bushings shall be installed on all metallic conduits. Conduit grounding bushings shall be set screw locking type electra-galvanized

malleable iron with insulation collar and shall be provided with a feed through compression lug for securing the ground bonding wire. Ground bonding wire shall be bare wire and shall be sized per NEC.

- M. All receptacles shall have their grounding contact connected to a grounding conductor.
- N. Branch circuit grounding conductors for receptacles, or other electrical loads shall be arranged such that the removal of a lighting fixture, receptacle, or other load does not interrupt the ground continuity to any other part of the circuit.

2.08 ELECTRICAL POWER PANEL

1. Ratings: Current, voltage, number of phases, number of wires as indicated on the Drawings. 10,000 amp minimum short circuit rating or as indicated in the schedule. Standards: NEMA PB 1, NFPA 70, UL 50, UL 67.
2. Construction: Interiors factory assembled and designed such that switching and protective devices can be replaced without disturbing adjacent units and without removing the main bus connectors. Main lugs: Solderless type approved for copper and aluminum wire.
3. Bus Bars:
 - a. Main bus bars: Plated aluminum or copper sized to limit temperature rise to a maximum of 65 DegC above an ambient of 40 DegC. Drilled and tapped and arranged for sequence phasing of the branch circuit devices.
 - b. Neutral bus bars: Insulated 100 percent rated or 200 percent rated, when indicated on the Drawings and with solderless mechanical type connectors.
4. Enclosure:
 - a. Boxes: Code gage galvanized steel, furnish without knockouts.
 - b. Trim assembly: Code gage steel finished with rust inhibited primer and manufacturers standard paint inside and out.
 - c. Lighting panelboard: Trims supplied with hinged door over all circuit breaker handles. Trims for surface mounted panelboards, same size as box. Doors lockable with corrosion resistant chrome-plated combination lock and catch, all locks keyed alike. Nominal 20 IN wide and 5-3/4 IN deep with gutter space in accordance with NEC. Clear plastic cover for directory card mounted on the inside of each door.
5. Overcurrent and Short Circuit Protective Devices: Main overcurrent protective device to be a molded case circuit breaker. Branch overcurrent protective devices to be a mounted molded case circuit breaker.

2.09 LIGHTING FIXTURES AND CONTROLLER

- A. Lighting Control Panel
 1. 4 relay, 2 pole, 20 amp
 2. Programmable for time of day

3. Photocell
 4. Operator interface on front panel
 5. Nema 3r enclosure
 6. Outdoor, wall mounted
- B. Lighting Fixtures
- C. See lighting fixture schedule for requirements

2.010 ELECTRICAL ENCLOSURES AND BOXES

- A. Enclosures to be NEMA rated with fast access door latches. Enclosure construction shall be 14 gauge minimum with continuously welded seams. Outer door shall have provisions for locking enclosure with standard padlock. Provide white backpan in each box. Provide thermoplastic data pocket mounted on inside door. Provide enclosures with accessories consisting of breaker to disconnect incoming power, padlockable disconnect for breakers used in circuits above 120VAC.

PART 3 – EXECUTION

3.01 ELECTRICAL WORKMANSHIP

- A. All work in this Section shall conform to the codes and standards outlined herein.
- B. The Electrical Contractor shall employ personnel that are skilled and experienced in the installation and connection of all elements, equipment, devices, instruments, accessories, and assemblies. All installation labor shall be performed by qualified personnel who have had experience on similar projects. Provide first class workmanship for all installations.
- C. Ensure that all equipment and materials fit properly in their installations and all doors open a minimum of 90°.
- D. Perform any required work to correct improper installations at no additional expense to the Owner.
- E. The Engineer reserves the right to halt any work that is found to be substandard or being installed by unqualified personnel.

3.02 ELECTRICAL CONSTRUCTION METHODS, GENERAL

- A. All wiring shall be neatly bundled and laced with plastic tie-wraps, anchored in place by screw attached retainer. Where space is available, such as in electrical cabinets, all wiring shall be run in slotted plastic wireways or channels with dust covers. Wireways or channels shall be sized such that the wire fill does not exceed 60%. Wires carrying 100 volts and above shall be physically separated from lower voltage wiring by using separate bundles or wireways with sufficient distance to minimize the introduction of noise, crossing only at 90 degree angles. Tie-wraps shall be T & B TY-RAP's, or approved equal.

- B. All devices shall be permanently labeled and secured in accordance with subsections labeled "NAMEPLATES AND TAGS".
- C. All field wires and panel wires have wire markers as specified in the "WIRE" subsection.
- D. All components associated with a particular compartment's or enclosure's function shall be mounted in that compartment or enclosure.
- E. Spacing and clearance of components shall be in accordance with UL, JIC, and NEC standards.
- F. Wires shall not be spliced except where shown. Devices with pigtails, except lighting fixtures, shall be connected at terminal blocks. Equipment delivered with spliced wires shall be rejected and the Contractor required to replace all such wiring, at no additional cost to the Owner.
- G. No wires shall be spliced without prior approval by the Engineer.
- H. Where splices are allowed or approved by the Engineer they shall conform with the following:
 - 1. Splices of #10 and smaller, including fixture taps, shall be made with see-thru nylon self-insulated twist on wire joints; T & B "Piggys", Ideal "Wing Nut", or approved equal.
 - 2. Splices of #8 and larger shall be hex key screw two way connectors, with built in lock washers; T & B "Locktite", O-Z type XW, or approved equal, insulated with 3M Scotch Super #88, Plymouth, or approved equal.
 - 3. Splices in underground pullboxes shall be insulated and moisture sealed with 3M "Scotchcast" cast resin splice kits and shall have a date marking for shelf life. Do not use splice kits with a date marking for shelf life that has expired.
 - 4. Wire splicing devices shall be sized according to manufacturer's recommendations.
- I. Tapes shall conform to the requirements of UL 510 and be rated: 105 degrees C, 600V, flame retardant, hot and cold weather resistant. Vinyl plastic electrical tape shall be 7 mil black. Phase tape shall be 7 mil vinyl plastic, color coded as specified. Electrical insulation putty shall be rubber based, elastic putty in tape form. Varnished cambric shall be 9 mil cotton tape impregnated with yellow insulating varnish and adhesive backed.
- J. Equipment shall be wired and piped by the manufacturer or supplier. Major field modifications or changes are not allowed without the written "change order" authority by the Engineer. When field changes are made, the components, materials, wiring, labeling, and construction methods shall be identical to that of the original supplied equipment. Contractor's cost to replace or rework the equipment to match original manufacturer or supplier methods shall be done at no additional cost to the Owner.
- K. Mating fittings, bulkhead fittings, plugs, lugs, connectors, etc. required to field interface to the equipment and panels shall be provided by the supplier when

the equipment is delivered.

- L. All electrical and instrumentation factory as-built drawings associated with the equipment shall be provided with the equipment when it is delivered to the job site. Drawings for each piece of equipment shall be placed in clear plastic packets of sufficient strength that will not tear or stretch from drawing removal and insertion.

3.03 DAMAGED PRODUCTS

- A. Damage products will not be accepted. All damaged products shall be replaced with new products at no additional cost to the Owner.

3.04 FASTENERS & LUGS

- A. Fasteners for securing equipment shall be stainless steel. The fastener size shall match equipment mounting holes.
- B. All wire & cable lugs shall be copper; aluminum or aluminum alloy lugs shall not be used. The Electrical Contractor shall supply all lugs to match the quantity & size of wire listed in the conduit & wire routing schedule.

3.05 INSTALLATION, GENERAL

A. System

1. Install all products per manufacturer's recommendations and the Drawings.
2. Contract Drawings are intended to show the basic functional requirements of the electrical system and instrumentation system and do not relieve the Contractor from the responsibility to provide a complete and functioning system.

- B. Provide all necessary hardware, conduit, terminal blocks, wiring, fittings, and devices to connect the electrical equipment provided under other Sections. The following shall be done by the Contractor at no additional cost to the Owner:

1. Provide additional devices, wiring, terminal block, conduits, relays, signal converters, isolators, boosters, and other miscellaneous devices as required to complete interfaces of the electrical and instrumentation system.
2. Changing normally open contacts to normally closed contacts or vice versa.
3. Adding additional relays to provide more contacts as necessary.
4. Installing additional terminal blocks to land wires.

C. Panels and Enclosures

1. Install panels and enclosures at the location shown on the Plans or approved by the Engineer.
2. Install level and plumb.
3. Clearance about electrical equipment shall meet the minimum requirements of NEC 110-26.

4. Box supports shall be located and oriented as directed in field by Owner.

D. Conduits and Ducts

1. Care shall be exercised to avoid interference with the work of other trades. This work shall be planned and coordinated with the other trades to prevent such interference. Pipes shall have precedence over conduits for space requirements. Exposed conduits shall be neatly arranged with runs perpendicular or level and parallel to walls. Bends shall be concentric.
2. Install conduit free from dents and bruises.
3. All conduits shall be labeled on all ends; at junction boxes, pull boxes, enclosures, stub-outs, or other terminations.
4. A maximum of three equivalent 90 degree elbows are allowed in any continuous runs. Install pull boxes where required to limit bends in conduit runs to not more than 270 degrees or where pulling tension would exceed the maximum allowable for the cable.
5. Route all above grade outdoor conduits or conduits in rated areas parallel or perpendicular to structure lines and/or piping.
6. Conduit entrances: Seal each conduit entrance from below grade into the panels, and other electrical enclosures with plugging compound sealant to prevent the entrance of insects and rodents.
7. Special "Soft-Jaw" type pipe clamps shall be used to prevent damage to PVC-coated conduits while field threading, cutting to length, and coupling sections.
8. Conduits shall be painted to match the color of surface attached to as directed by Owner.
9. All spares shall be mandrel and have pull ropes installed.

E. Conduit and Wire Routing Schedule

1. Conduit material, wire size, and quantity listed in schedule take precedence over Division 16 Specifications.
2. All of the entries for each line in the conduit schedule apply to each conduit when multiple quantity of conduits multiple quantity of conduits (quantity of which are indicated by number entered in conduit no. column in schedule) are listed in the schedule.
3. Wire sizes listed are in AWG or Kcmil and are copper conductors.
4. Extra wire was intentionally placed in the "Conduit & Wire Routing Schedule" which shall be labeled on both ends with a unique wire label.
5. Contractor to supply and install all conduits and wiring as shown on Utility Engineered Design drawings. Utility primary and secondary conduit and wiring shown in "Conduit and Wire Routing Schedule" is for bid purposes only. A credit or add-on will be provided by Contractor based on the actual work performed by Contractor for the Utility service.
6. All control and signal wiring terminations shall have the correct wire label applied prior to making connection.
7. Vertical offsets and sloping of conduits are not detailed on plans, the Electrical Contractor shall include in his bid the price for the complete conduit run utilizing the civil & mechanical plans to measure vertical &

slope distances.

F. Excavation and Back Filling

1. The Electrical Contractor shall provide the excavation for equipment foundations, and trenches for conduits or buried cables. Repave any area that was paved prior to excavation.
2. Underground conduits outside of structures shall have a minimum cover of 24 inches except for utility conduits depth shall be as required by the governing utility requirements. Back filling shall be done only after conduits have been inspected.
3. Excavation and back fill shall conform to the requirements of the Earthwork Section of these Specifications, unless modified on plans.
4. At all times during the installation of the electrical distribution system, the Contractor shall provide barricades, fences, guard rails, etc., to safeguard all personnel, including small children, from excavated trenches.

G. Wiring, Grounding, and Shielding - It is important to observe good grounding and shielding practices in the generally noisy environment in this application. The shield of shielded cables shall be terminated to ground at one end only (source end), the shield at the other end (receive end) shall be encased in an insulated material to isolate it from ground.

H. Cutting and Patching - The Contractor shall do all cutting and patching required to install his work. Any cutting which may impair the structure shall require prior approval by the Engineer. Cutting and patching shall be done only by skilled labor of the respective trades. All surfaces shall be restored to their original condition after cutting and patching. Paint patched surfaces to match the original color.

I. Cleaning and Touch up

1. Vacuum and clean the inside of all enclosures prior to applying power and at the end of the project prior to final acceptance.
2. At the completion of the work, all parts of the installation, including all equipment, exposed conduit, and fittings, shall be thoroughly cleaned of grease and metal cuttings. Any discoloration or other damage to parts of the finish, or the furnishings, due to the Contractor's failure to properly clean the system, shall be repaired by the Contractor without cost to the Owner.
3. The Contractor shall paint scratched or blemished surfaces with the necessary coats of quick drying paint to match existing color, texture and thickness. This shall include all prime painted electrical equipment including but not limited to enclosures, poles, boxes, devices, etc.

3.06 ELECTRICAL TESTING

A. General requirements

1. It is the intent of these tests to assure that all equipment is operational within industry and manufacturer's tolerances and is installed in accordance with design plans and specifications.

2. All equipment setup and assembled by the Contractor shall be in accordance with the design plans and Drawings and the manufacturer's recommendations and instructions and shall operate to the Engineer's satisfaction. Follow all manufacturer's instructions for handling, receiving, installation, and pre-check requirements prior to energization. After energization, follow manufacturer's instructions for programming, set-up and calibration of equipment. The Contractor shall be responsible for, and shall correct by repair or replacement, at his own expense, equipment which, in the opinion of the Engineer, has been caused by faulty mechanical or electrical assembly by the Contractor. Necessary tests to demonstrate that the electrical and mechanical operation of the equipment is satisfactory and meets the requirements of these Specifications shall be made by the Contractor at no additional cost to the Owner.
3. The testing shall not be started until the manufacturer has completed fabrication, wiring, and setup; performed satisfactory checks and adjustments; and can demonstrate the system is complete and operational. Certification of completion of Contractor's in-house tests shall be submitted prior to scheduling of factory testing.
4. The first Pre-Energization tests shall be performed to determine the suitability for energization and shall be completed with all power turned off and complete prior to the start of any of the Post-Energization Tests. The Electrical Contractor shall have qualified personnel on the job site for all Pre-Energization and Post-Energization tests.
5. All tests shall be witnessed by the Engineer and/or Owner personnel. The test forms shall be completed by the testing person for field checkout, testing, and calibration of all equipment and instruments. All filled in test forms shall be given to the Engineer and/or Owner the day of the test. Fill in two sets of test forms if Contractor wants to keep a copy. All tests shall be documented in writing by the supplier and signed by the Engineer as satisfactory completed. The supplier shall keep a detailed log of all tests that failed or did not meet specifications, including date of occurrence and correction. Completed forms with proper signatures and dates shall be included and become a component of the Operations and Maintenance Manual for each of the respective systems.
6. Prior to any field testing, Interconnection Drawings and Operation & Maintenance Manuals shall have been submitted by the Contractor and approved by the Engineer.
7. The Contractor shall notify the Owner and the Engineer of the Supplier's readiness to begin all factory and field tests in writing (a minimum of ten working days prior to start), and shall schedule system checkout on dates agreed to by the Owner and the Engineer in order that the testing be scheduled and witnessed.
8. The supplier shall submit for approval, the proposed factory & field testing sheets at least 24 days prior to the start of the tests. Each testing sheet shall have a title giving the type of test and entry spaces for the name of the person who performed the test, name of the person who witnessed the

test, and the date. Tests performed without approved forms shall be retested at no additional cost to Owner.

9. Separate test procedures in separate binders shall be submitted for approval for the Factory and Field Tests. Testing shall not commence until the test procedures have been reviewed and approved by the Owner. Tests forms shall be similar to those shown on Appendix "A".
10. If the results of any of tests are unacceptable to the Engineer, the Contractor shall make corrections and perform the tests again until they are acceptable to the Engineering; these additional tests shall be done at no additional cost to the Owner.

B. Failure to Meet Test

1. Any system material or workmanship which is found defective on the basis of acceptance tests shall be reported to the Engineer. The Contractor shall replace the defective material or equipment and have tests repeated until test proves satisfactory to the Engineer without additional cost to the Owner.

C. Safety

1. Testing shall conform to the respective manufacturer's recommendations. All manufacturer's safety precautions shall be followed.
2. The procedures stated herein are guidelines for the intended tests, the Contractor shall be responsible to modify these tests to fit the particular application and ensure personnel safety. Absolutely no tests shall be performed that endanger personal safety.
3. The Contractor shall have two or more personnel present at all tests.
4. Two non-licensed portable radios are to be made available by the Contractor for the testing organization to conduct tests.
5. California Electrical Safety Orders (ESO) and Occupational Safety and Health Act (OSHA): The Contractor is cautioned that testing and equipment shall comply with ESO and OSHA as to safety, clearances, padlocks and barriers around electrical equipment energized during testing.
6. Field inspections and pre-energization tests shall be completed prior to applying power to equipment.

D. Electrical Field Tests

1. Pre-Energization Tests: These tests shall be completed prior to applying power to any equipment.
 - a. Inspections
 - 1) Visual and mechanical inspections
 - a) Inspect for physical damage, proper anchorage and grounding.
 - b) Compare equipment nameplate data with design plans and starter schedule.
 - c) Compare overload setting with motor full load current for proper size.

- 2) Performed NETA acceptance testing for each piece of equipment.
 - 3) The Contractor shall fill in, for each piece of equipment, NETA Test Form.
- b. Torque Connections
- 1) All electrical, mechanical and structural threaded connections inside equipment shall be tightened in the field after all wiring connections have been completed. Every worker tightening screwed or bolted connections shall be required to have and utilize a torque screwdriver/wrench at all times. Torque connections to the value recommended by the equipment manufacturer. If they are not available, use NEC 110-14 for torque values as guidelines.
- c. Wire Insulation & Continuity Tests
- 1) All devices that are not rated to withstand the 500V megger potential shall be disconnected prior to the megger tests.
 - 2) Megger insulation resistances of all 600 volt insulated conductors using a 500 volt megger for 10 seconds. Make tests with circuits installed in conduit and isolated from source and load. Each field conductor shall be meggered conductor to conductor and conductor to ground. These tests shall be made on cable after installation with all splices made up and terminators installed but not connected to the equipment.
 - 3) Each megger reading shall not be less than 10 Meg-ohms resistive. Corrective action shall be taken if values are recorded less than 10 Meg-ohms. Values of different phases of conductors in the same conduit run showing substantially different Meg-ohm values, even if showing above 10 Meg-ohms shall be replaced.
 - 4) Each instrumentation conductor twisted shielded pair shall have the conductor and shield continuity measured with an ohmmeter. Conductors with high ohm values, that do not match similar lengths of conductors the same size, shall be replaced at no additional cost to the Owner.
- d. Grounding System Tests
- 1) Visual and Mechanical Inspection
 - a) Verify ground system is in compliance with Drawings and Specifications.
 - 2) Electrical Tests
 - a) Before backfilling trenches, and placement of sidewalks, landscape and paving, measure the resistance of each electrode to ground using a ground resistance tester. Perform the test not less than two days after the most recent rainfall and in the afternoon after any ground condensation (dew) has evaporated.
 - b) After all individual ground electrode readings have been made, interconnect as required and measure the system's ground resistance.
 - c) The grounding test shall be in conformance with IEEE Standard 81.

- d) The current reference rod shall be driven at least 100 feet from the system under test.
 - e) Measurements shall be made at 10 feet intervals beginning 25 feet from the test electrode and ending 75 feet from it in a direct line between the system being tested and the test electrode.
 - 3) Point-to-Point
 - a) Perform point-to-point tests to determine the resistance between the main grounding system and all major electrical equipment frames, system neutral, and/or derived neutral points.
 - 4) Test Values
 - a) The resistance between the main grounding electrode and equipment ground shall be no greater than five ohms per IEEE Standard 142.
 - b) Investigate point-to-point resistance values that exceed 0.5 ohms.
 - e. Panelboard Test
 - 1) Visual and Mechanical Inspection
 - a) Inspect for physical damage, proper anchorage and grounding.
 - b) Compare equipment nameplate data with design plans.
 - c) Compare breaker legend for accuracy.
 - d) Check torque of bolted connections.
 - f. Breaker Tests
 - 1) All breakers shall be checked for proper mounting, conductor size, and feeder designation. Operate circuit breaker to ensure smooth operation. Inspect case for cracks or other defects. Check tightness of connection with torque wrench in accordance with manufacturer's recommendations.
 - 2) All breakers 100 amps and above shall be tested. Time current characteristic tests shall be performed bypassing three hundred percent (300%) rated current through each pole separately. Trip time shall be determined. Instantaneous pickup current shall be determined by run up or pulse method. Clearing times should be within four (4) cycles or less. All trip times shall fall within NETA Table values. Instantaneous pickup current levels should be within 20% of manufacturer's published values. Certification stickers, listing date and company who performed the tests, shall be attached to the inside of the breaker compartment door right after the breaker has passed all tests.
 - 3) Contact and Insulation Resistance: Contact resistance shall be measured and be compared to adjacent poles and similar breaker. Deviations of more than 50% shall be reported to Engineer. Insulation resistance shall be measured and shall not be less than 100 megohms.
 - 4) After the completion of all breaker tests, all TM & MCP breakers shall be set by Contractor to their proper settings to protect equipment.
 - 5) The Contractor shall fill in Breaker Test Form TF8 located in Appendix "A".
2. Post Energization Tests
- g. Panels and Electrical Enclosure Tests

- 1) During these tests, test all local and remote control operations and interlocks.
- 2) Electrical Tests
 - a) Per form operational tests by initiating control devices to affect proper operation.
 - b) The Contractor shall fill in Operational Device Checks and Tests Form TF6.
- h. Phase Rotation Tests
 - 1) Check connections to all equipment for proper phase relationship, this includes all three-phase panels and electrical enclosures and all motor loads. During this test, disconnect all devices which could be damaged by the application of voltage or reversed phase sequence. Three phase equipment shall be tested for the phase sequence "ABC" front to back, left to right, and top to bottom.
 - 2) All three phase motors shall be tested for proper phase rotation. Revise wire color codes to indicate correct phase color if wires are swapped.
- i. Trial Operations
 - 1) The entire electrical installation shall be either tested or trial operated to verify Contract compliance. That is, controls, heaters, fans, light switches, convenience receptacles, lights, etc. shall be trial operated. Contractor shall conduct trial operations in the presence of the Engineer and Operations and Maintenance personnel.

3.07 SPARE PARTS

- A. The Contractor shall supply all spare parts prior to start of field tests. All parts shall be sealed in plastic bags and delivered to each site in a heavy duty plastic storage bag. Bag shall be clearly labeled on the outside with part name and number and the corresponding equipment tagname.
- B. The Contractor shall make available any replacement parts that are not manufacturer's normal stock items for immediate service and repair of all the instrumentation equipment throughout the warranty period.
- C. The following spare parts shall be provided to the Owner as part of this Contract for each site:
 1. One light fixture of each type.
 2. One circuit breaker of each type and rating

3.08 WARRANTY

- A. The Contractor shall have a staff of experienced personnel available to provide service on 2 working days notice during the warranty period. Such personnel shall be capable of fully testing and diagnosing the hardware and software and implementing corrective measures.
- B. If the Contractor fails to respond in 2 working days, the Owner at its option will proceed to have the warranty work completed by other resources; the total cost for these other resources shall be reimbursed in full by the Contractor.

- “Fail to respond” shall be defined as: The Contractor has not shown a good faith effort and has not expended adequate resources to correct the problem. The use of other resources, as stated above, shall not relieve or change the Contractor from fulfilling the remainder of the warranty requirements.
- C. The Contractor shall reimburse Owner for all direct and indirect costs associated with Owner repairs.
 - D. The Contractor shall warrant all electrical equipment for a period of one (1) year from date of final acceptance. Standard published warranties of equipment which exceed the preceding specified length of time shall be honored by the manufacturer or supplier.
 - E. Prior to "final acceptance", the Contractor shall furnish to the Engineer a listing of warranty information for all manufacturers of materials, instruments, and equipment used on the project. The listing shall include the following:
 - 3. Manufacturer's name, service contact person, phone number, and address.
 - 4. Material and equipment description, equipment number, part number, serial number, and model number.
 - 5. Manufacturer's warranty expiration date.
 - F. The Contractor shall provide all labor and material to troubleshoot, program, replace, or repair any hardware or software that fails or operates unpredictably during the warranty period, at no additional cost to the Owner.
 - G. Each time the Supplier's repair person responds to a system malfunction during the warranty period, he or she must contact the designated Owner maintenance supervisor for scheduling of the work, access to the jobsite, and permission to make repairs. Operation of facilities necessary to test equipment shall only be performed by or under the direction Owner staff. Owner reserves the right at its sole discretion to deny operations requested by the Supplier. A written description of all warranty work performed shall be documented on a field service report to be given to Owner prior to the repair person leaving job site. This field service report shall detail and clearly state problem, corrective actions taken, additional work that needs to be done, data, repair person name and company.

3.09 FINAL ACCEPTANCE

- A. Final acceptance will be given by the Owner after the equipment has passed the "operational testing" trial period, each deficiency has been corrected, as-built documentation has been provided, and all the requirements of design documents have been fulfilled.
- B. Upon completion of the project, prior to final acceptance, remove all temporary services, equipment, material, and wiring from the site.
- C. At the end of the project, following the completion of the field tests, and prior to final acceptance, the Supplier shall provide the following to the Owner:
 - 6. Listing of warranty information.

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7. Each "operation and maintenance" manual shall be modified or supplemented by the Supplier to reflect all field changes and as-built conditions.
8. Two (2) CD disk copies or downloadable copies of all final documentation to reflect as-built conditions.

END OF SECTION

PLANS AND DRAWINGS

PLANS AND DRAWINGS

"THE FOLLOWING PLANS AND DRAWINGS ARE INCORPORATED HEREIN BY REFERENCE AS IF SET FORTH IN THEIR ENTIRETY:

- 1. CORPORATION YARD IMPROVEMENTS PROJECT – Dated May 2017**

PLANS AND DRAWINGS

- 1 -

APPENDICES

"THE FOLLOWING APPENDICES ARE INCORPORATED HEREIN BY REFERENCE AS IF SET FORTH IN THEIR ENTIRETY:

- 1. GEOTECHNICAL REPORT**
- 2. ENVIRONMENTAL DOCUMENTATION**
- 3. STORM WATER POLLUTION PREVENTION PLAN**

APPENDICES

- 1 -

**REPORT OF
GEOTECHNICAL INVESTIGATION**

**CHWD Corp. Yard Master Plan Ph. 1
6230 Sylvan Road
Citrus Heights, California**



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**REPORT OF
GEOTECHNICAL INVESTIGATION**

**CHWD Corp. Yard Master Plan Ph. 1
6230 Sylvan Road
Citrus Heights, California**

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January 31, 2017

Project Number: 1658-01-16

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INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed improvements at the existing Citrus Heights Water District's (CHWD's) facility yard located at 6230 Sylvan Road in Citrus Heights, California (Plate 1). Our work was conducted in accordance with our professional services agreement dated September 30, 2016. The report also contains the results of the field exploration and laboratory testing programs upon which our recommendations are based.

1.1 PROJECT DESCRIPTION

PGI understand that the proposed improvements at the site consist of:

- One vehicle wash station, pier-supported (about 1,000 square feet footprint);
- One vacuum excavation dump pit concrete structure (about 1,000 square feet footprint; up to about 6 feet deep);
- One material storage structure (about 3,3000 square feet footprint);
- Soundwall along eastern and southern site boundaries, pier-supported precast concrete panels (estimated total length of 500 feet; maximum height is 8 feet);
- 12-inch-diameter water line (approximately 200 feet in length);
- Storm drain and sewer pipelines; and
- Pavement (asphalt and/or concrete).

Additionally, a "Future Building" (footprint possibly on the order of 7,000 square feet; undetermined structure type) is identified for a future phase of the site improvements, located west-northwest of the Wash Station structure.

PGI's understanding of the project is based on: 1) our communications with Messrs. Joe Domenichelli and Daryl Heigher of Domenichelli & Associates, Inc.; 2) our review of a request for proposal, undated, provided to us by Domenichelli & Associates, Inc., via email on September 30, 2016; our review of a preliminary site plan "Renovation Site Plan", sheet C2, dated 11/07/2016; and our site meeting with Domenichelli & Associates and CHWD staff on December 13, 2016.

1.2 PURPOSE AND SCOPE OF WORK

The purpose of this investigation was to evaluate the suitability of the project site, from a geotechnical perspective, for the proposed improvements. The scope of our work included the following: 1) reviewing selected geologic references; 2) performing a reconnaissance of the site and surrounding vicinity; 3) drilling 4 exploratory borings; 4) laboratory testing of selected

samples of earth materials recovered from the borings; 5) engineering analyses; and 6) preparation of this report.

This report contains the results of the investigation including: 1) our findings regarding site geotechnical and groundwater conditions; 2) a site plan showing boring locations; 3) logs of the exploratory borings; 4) results of laboratory testing and engineering analyses; and 5) our geotechnical conclusions and recommendations for design and construction of the proposed project.

FIELD EXPLORATION AND LABORATORY TESTING

2.1 FIELD EXPLORATION

Four exploratory borings were drilled at the site at the approximate locations shown on the attached boring location plan (Plate 2). The borings were drilled to depths of approximately 16 to 20 feet using a truck-mounted drill rig. A complete description of our field investigation and the logs of the borings are presented in Appendix A.

2.2 LABORATORY TESTING

Laboratory testing was conducted on selected relatively undisturbed and disturbed soil samples recovered from the exploratory borings to evaluate their physical characteristics and engineering properties. The following testing was performed:

- Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock and Soil Aggregate Mixtures (ASTM D 2216);
- Standard Test Method for Amount of Material in Soils Finer Than the No. 200 Sieve (ASTM D 1140);
- Standard Test Method for Particle-Size Analysis of Soils (ASTM D 422);
- Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (ASTM D 4318);
- Standard Test Method for Resistance R-Value and Expansion Pressure of Compacted Soils (ASTM D 2844);
- pH and Minimum Resistivity (California Test 643);
- Sulfate Content (California Test 417); and
- Chloride Content (California Test 422).

Laboratory test results are presented in the boring logs at the corresponding locations of the samples tested, and in Appendix B.

3.0
FINDINGS

3.1 SITE CONDITIONS

The approximately rectangular shaped site is located near the northeast corner of Greenback Lane and Sylvan Road. The approximate coordinates of the project site are latitude 38.6791 degrees North and longitude 121.2892 degrees West. The site encompasses about 1 acre and is bordered by CHWD facility on the west and Sylvan Road beyond, CHWD facility on the north and commercial property beyond, public school on the east, and private/commercial property on the south and Greenback Lane beyond.

At the time of our field exploration the site contained the existing CHWD yard's material handling / storage area and two (2) unlined excavations for vacuum truck material unloading understood to be on the order of 5 feet deep. In general the site sloped down gradually from south to north with overall topographic relief of on the order of about 5 feet. The site contained several large, mature trees. Additionally, there were existing underground utilities (gas, sewer, storm drain).

3.2 SUBSURFACE CONDITIONS

3.2.1 Subsurface Materials

The project site is located within the Great Valley geomorphic province (Sacramento - San Joaquin Valley). The Great Valley is composed of thick sequences of alluvial deposits derived primarily from erosion from the adjoining Sierra Nevada mountain range. The site is mapped as being underlain by Quaternary age alluvial deposits of sand, silt and gravel of the Turlock Lake Formation (Wagner, 1981).

PGI's exploratory borings generally encountered between about 1.5 and 2.5 feet of fill or likely fill overlying native soils extending to the maximum depth explored of approximately 20.0 feet below existing grade, except that no fill was found in boring B1. The fill and likely fill appeared to consist of local native soils with gravel or crushed rock, and some rubble. The native soils generally consisted of about 1 to 4 feet of medium stiff to stiff clay (borings B2 and B4 only) overlying loose to very dense silts and sands, locally cemented, to the maximum depth explored.

The generalized profiles encountered in our exploratory borings are summarized below:

Boring No.	Depth (feet below existing grade)		
	Fill	Native Soils	Bedrock
B1	--	0.0 - 16.5+	not found
B2	0.0 - 2.5	2.5 - 16.0+	not found
B3	0.0 - 1.5	1.5 - 16.0+	not found
B4	0.0 - 1.5	1.5 - 20.0+	not found



A more detailed description of the subsurface conditions encountered is presented on the boring logs (Appendix A).

3.2.2 Groundwater Conditions

Free groundwater was not found in our borings. Groundwater data for the project vicinity indicates a historic high groundwater level in the site area of about 100 feet below the ground surface (Sacramento County Department of Water Resources, 2009).

Groundwater levels at the site may fluctuate over time due to variations in rainfall, irrigation practices (both on- and off-site), runoff conditions and other factors. The groundwater conditions presented in this report may not be representative of those found during, or subsequent to, construction.

3.3 GEOLOGIC HAZARDS

3.3.1 Fault Rupture

The site is not located within a current Alquist-Priolo Earthquake Fault Zone (EFZ), and PGI did not observe geomorphic features that would suggest the presence of active faulting at the site. Therefore, the probability of ground surface rupture along a fault trace at the site is considered to be low.

3.3.2 Ground Shaking

The project site is located in an area generally characterized as having low to moderate seismicity. The nearest mapped fault to the site considered capable of producing ground shaking at the site (U.S. Geological Survey, 2008) is Segment 5 of the Great Valley fault system; located approximately 45 km to the southwest. This 500-km-long fault system runs along the southwest side of the Sacramento and Central Valleys from near the town of Willows on the northern end, to the Kettleman Hills/Lost Hills area on the southern end. The 1892 Vacaville-Winters earthquake (M_w 6.4 to 6.8) is thought to be associated with a segment of this fault (Wong, et al.; 1988).

The nearest mapped active fault (defined as having experienced surface rupture within the past 11,000 years) to the site is the Green Valley fault, located about 80 km southwest. Consequently, we judge that the probability of the site being subjected to strong earthquake shaking during the life of the improvements is low.

3.3.3 Liquefaction

Seismic liquefaction occurs when excess pore pressures are generated in loose, saturated, generally cohesionless soil during earthquake shaking, causing the soil to experience a partial to complete loss of shear strength. Such a loss of shear strength can result in settlement and/or

horizontal movement (lateral spreading) of the soil mass. The occurrence of liquefaction is dependent on several factors, including the intensity and duration of ground shaking, soil density and particle size distribution, and position of the groundwater table.

Due to the historic depth of groundwater within the project site area, the depth and density of sandy soils and distance to significant fault sources, the potential for liquefaction to occur at the site is considered to be very low.

3.3.4 Densification

Seismic densification typically occurs in relatively loose, uniformly graded sandy soils above the groundwater table. Based on the generally medium dense to very dense state of the sands found in our borings, PGI judge that significant seismic densification due to ground shaking is unlikely to occur.

DISCUSSION AND CONCLUSIONS

Based on the results of our investigation, PGI conclude that the site is suitable, from a geotechnical standpoint, to receive the planned improvements provided the recommendations presented in this report are adhered to. The primary geotechnical concerns are discussed below:

4.1 FOUNDATION AND SLAB SUPPORT

The exploratory borings indicate the presence of near surface soils anticipated to be adequate for supporting both conventional spread foundations and driller pier foundations, and slab-on-grade. However, these materials will require overexcavation and replacement as engineered fill to provide uniform bearing conditions for shallow foundations and slab-on-grade, and reduce the potential for differential settlements and impacts from potentially expansive soils. For foundations and subgrade designed and prepared as recommended in this report, post-construction static differential settlements are expected to be on the order ½-inch in 40 feet.

4.1.1 Future Building

None of PGI's borings was located within the "Future Building" footprint. However, boring B4 was located about 20 feet to the east-southeast. Based on the materials found in our borings, and in particular boring B4, PGI judge that ground conditions in the Future Building area are likely to be generally consistent with those found in our borings, and generally suitable for a light single-story structure supported on shallow foundations with concrete slab-on-grade floor. However, site topography suggests this area is possibly relatively low and as such may contain greater amounts of fine grained soils including clays which may require additional overexcavation and replacement.

Geotechnical recommendations for design and construction of the Future Building should be developed after a structure type and foundation system have been selected, and possibly additional geotechnical investigation is conducted in the area, which are not included in this scope of work.

4.2 EXPANSIVE SOILS

Expansive soils are defined as soils that undergo large volume changes (shrink or swell) due to variations in moisture content. Such volume changes may cause damaging settlement and/or heave of foundations, slabs-on-grade, pavements, flatwork, etc. The soils found in PGI's borings B2 and B4 between depths of about 2 feet and extending to a depth of about 5 feet were generally of moderate plasticity. These materials are judged to be capable of generating significant expansive pressures.

Typical alternatives to address the effects of expansive soil include:

- removal and replacement of near-surface soils with non-expansive granular soils;
- chemical treatment of the near-surface soils;
- post-tensioned slab-on-grade (PT slab); and
- drilled pier foundations with suspended slab/floor system.

For small projects, soil replacement is often cost effective as it does not require a specialty contractor and additional design work (as do the other three alternatives).

It is assumed that overexcavation/replacement will be utilized for mitigation of the expansive soils, and the recommendations in this report reflect this. If one of the other alternatives is chosen for the project, PGI should be contacted for additional recommendations.

4.3 EXCAVATIONS

Based on the results of our field exploration, we anticipate that excavations will generally expose about 1.5 to 2.5 feet of gravelly fill (except boring B1 where no fill was found) overlying medium stiff clays and loose to very dense sands and silts, locally cemented, to a depth of about 20 feet.

We anticipate that excavations for the Vacuum Pit structure and underground utilities can be accomplished with a large backhoe or small to medium excavator. However, extra effort and/or a narrow bucket fitted with fresh sharp teeth or ripper shank may be required for economical excavation production extending into dense and very dense soils.

We anticipate that drilling for pier foundations for the Soundwall and Wash Station structure can be accomplished with a small to medium telescopic pier drilling rig mounted to a small to medium sized excavator. Due to proximity of Soundwall to large trees, a significant amount of large roots are expected. Given likelihood of encountering numerous and/or large roots, and the dense and locally cemented site soils, drilling of pier foundations will likely achieve superior production utilizing an excavator-mounted telescopic pier drilling head in lieu of non-telescoping (“dangle-drill”) system commonly mounted to a Bobcat or small backhoe which typically have significant difficulty passing through roots, rubble, and dense silts and sands.

4.4 WET SOILS

Based on the results of materials found in PGI’s exploratory borings and on laboratory testing, it appears that the existing subgrade soils will need to be dried back to achieve proper compaction; however this is largely dependent on the time of year of construction.

During the rainy season, infiltration of surface runoff may create wet or saturated soil conditions across the site. Such conditions may adversely impact grading operations. In addition, overly wet soils, if used for engineered fill, may require several days to dry back to a workable moisture

content. In the project area, it is common for the shallow dense soils underlying the surface soils to prevent infiltration of rainwater, thereby lengthening the time required for upper soils to dry naturally through evaporation. The time required for drying can often be reduced by discing, ripping or otherwise aerating the soil.

Chemical treatment may also be utilized to dry back overly wet soils. A designed approach is typically not required for the use of chemical treatment for drying only, and a specialty contractor is usually engaged by the general or grading contractor. However, coordination with PGI will be necessary to provide us opportunity to observe and test the treated materials.

4.5 GROUNDWATER

Groundwater was not encountered during drilling. Historic groundwater data for the project area suggest a groundwater depth of about 100 feet. However, soils judged to be relatively impermeable (clays, cemented silt and dense silty sands) were found in our borings which could create local perched groundwater conditions.

Should shallow groundwater be present during construction, groundwater control (i.e., dewatering, water-tight shoring) will be required for excavations extending into the groundwater table. Control of groundwater during construction should be contractually specified as solely the responsibility of the contractor.

4.5.1 Vacuum Pit Buoyancy

Due to a lack of long-term groundwater indicated by available records we were able to obtain, it is judged very unlikely that the structure will be subjected to buoyancy due to a long-term natural groundwater table. However, it is not possible to judge potential for structure buoyancy due to short-term groundwater conditions that could result from intrusion of surface water (e.g., stormwater, irrigation, etc.) into the adjacent area. Accordingly, risk of structure buoyancy will need to be evaluated by the designer and owner.

4.6 CORROSIVITY OF SUBSURFACE SOILS

Laboratory testing of a sample of the subsurface soil collected from one of our borings was conducted to evaluate the soil's corrosive potential to concrete, iron and steel. Testing conducted included sulfate and chloride content to determine the type of cement to use in concrete structures, and pH and minimum resistivity to evaluate the corrosivity of the subsurface materials to steel and ductile iron.

According to the California Department of Transportation (2003), a site is considered to be “corrosive” if one or more of the following conditions exist:

- chloride content ≥ 500 parts per million (ppm);
- Sulfate concentration $\geq 2,000$ ppm;
- pH ≤ 5.5 ; or
- minimum resistivity $\leq 1,000$ ohm-centimeters (ohm-cm).

Based on the above criteria, the materials tested would not be considered to be corrosive to buried metal or reinforced concrete structures. However, Paragon Geotechnical, Inc. are not corrosion experts. As such, we recommend that a corrosion engineer be consulted for recommendations concerning soil corrosion potential; including the need for cathodic protection and/or grounding systems.

5.0

RECOMMENDATIONS

5.1 SEISMIC DESIGN CRITERIA

Based on the information contained in this report, the following seismic design parameters for the site were developed in accordance with the *2016 California Building Code*:

Site Class	D
Risk Category	I/II/III
0.2 sec Spectral Acceleration, S_s	0.520
1.0 sec Spectral Acceleration, S_1	0.255
Site Coefficient, F_a	1.384
Site Coefficient, F_v	1.891
0.2 sec Max. Spectral Response, S_{MS}	0.719
1.0 sec Max. Spectral Response, S_{M1}	0.481

5.2 SITE PREPARATION

General site preparation should include complete removal of trash and debris, and stripping of surface vegetation. Removal of trees and shrubs should include complete removal of stumps and/or rootballs. Abandoned in-ground structures including pipes, culverts, utility vaults and foundations should be removed and replaced with engineered fill, placed and compacted as recommended in this report. Voids or depressions created by the removal of buried objects/rootballs should be cleaned of all loose soil and debris and backfilled with engineered fill.

5.2.1 Existing Vacuum Truck Dump Pits

Prior to drilling piers for Soundwall, the two existing dump pits should be abandoned, as follows. The pits should be cleaned of loose and/or wet material, and allowed to dry or pumped dry as needed. The pits should then be backfilled with engineered fill. Sidewalls should be benched horizontally a minimum of 2 feet at vertical intervals not exceeding 3 feet.

5.3 EARTHWORK

5.3.1 General

After site preparation, the areas to contain the new structures, and extending at least 3 feet beyond (Wash Station and Material Storage structures) and at least 6 feet beyond (Vacuum Pit structure), should be overexcavated below any fill and extending down to competent native soil.



The excavations should also extend deep enough to provide at least 12 inches without clay soils below bottom of foundation/structure/slab, as demonstrated by potholing as needed.

Additional overexcavation may be required depending on subsurface conditions present. The depth and extent of required overexcavation should be approved in the field by PGI during or immediately after excavation and prior to any further work (e.g., scarification, placement of fill or improvements, etc.).

Any clay soils encountered in overexcavations should be stockpiled separately and not used in building pad construction, structure backfill, or pavement.

The exposed subgrade should be level (uniform elevation across entire structure – including the Vacuum Pit ramp), and should be cross-scarified to a depth of at least 8 inches, moisture conditioned and compacted to between 88 and 92 percent (clay soils) and at least 90 percent (silt and sand soils) of the maximum dry density as determined by the ASTM D 1557 test method.

Clay subgrade should be moisture conditioning to at least 2 percent above the optimum moisture content, and all other soils should be moisture conditioned to at least the optimum moisture content. Any soft or loose areas should be excavated to firm, native material and replaced with engineered fill, placed and compacted as recommended in this report. After completion of overexcavation and subgrade preparation, the area should be constructed to finish pad grade with engineered fill.

Silty and sandy soils that lack sufficient cohesion to develop a well-defined moisture density curve should be compacted with a large vibratory compactor (minimum 20-ton dynamic impact). For estimating purposes, it should be anticipated that the compactor will need to make a minimum of 4 to 6 roundtrip passes in each of two perpendicular directions across the exposed subgrade. The actual number of passes required by a given piece of equipment should be determined in the field by a representative of PGI.

Material from foundation excavations, utility trenching, landscaping, etc., should be removed from the site, or placed and compacted as engineered fill. The building pad should be damp at the time concrete is placed. Cracks in foundation excavation soil, or building pad soil which is to support concrete slabs, should be closed by wetting prior to placing concrete. If foundations and slabs are not constructed within 15 days of pad construction, PGI should observe the site conditions and make additional recommendations as appropriate.

Pavement subgrade (including the Vacuum Pit, Wash Station, and Material Storage structures) should be scarified to a depth of at least 12 inches; moisture conditioned over the optimum moisture content, and compacted to a minimum of 95 percent of the maximum dry density as determined by the ASTM D 1557 test method.

5.3.2 Engineered Fill

All fill should be a non-plastic or low-plasticity homogenous mixture of soil and rock free of vegetation, organic material, rubbish, and/or rubble. PGI anticipate that some of the soils generated from on-site excavations will be suitable for use as engineered fill. However, moderate- and high-plasticity clay soils (plasticity index of 15 or greater) are not suitable for use as engineered fill in building pads, even when blended with low-plasticity and/or non-plastic materials; and provision should be made to off-haul these soils, or place them in landscape areas.

Import material to be used as engineered fill should be free of organic material and meet the specifications listed below:

R-value ¹ (ASTM D 2844)	Atterberg Limits (ASTM D 4318)	Particle Size (ASTM C 136 or D 422)
≥ 20	PI < 15 LL < 40	100% passing the 4 in. sieve minimum of 85% passing the 2-½ in. sieve maximum of 30% passing the #200 sieve

1. Required for import soil used in pavement areas.

Paragon Geotechnical, Inc. should approve all imported fill material prior to it being brought on site.

Engineered fill should be placed in horizontal loose lifts not exceeding 8 inches in thickness. Fill should be moisture conditioned over optimum, and compacted to a minimum of 90 percent of the maximum dry density as determined by the ASTM D 1557 test method. In areas to be paved, the top 12 inches of fill should be compacted to a minimum of 95 percent of the maximum dry density as determined by the ASTM D 1557 test method.

5.3.3 Utility Trenches

Trenches should be deep enough to provide at least 18 inches from top of pipe to pavement subgrade (bottom of AB).

Underground utilities should be bedded and initially backfilled in accordance with the pipe manufacturer’s recommendations, and applicable public agency requirements. Open-graded material (e.g., crushed rock, pea gravel) should not be used as backfill, including bedding and pipe-zone. **If open-graded material is required by public agency, it should be completely encased in non-woven geotextile filter fabric (such as Mirafi 140N) to prevent infiltration of soil and subsequent backfill.**



All trench backfill should be mechanically compacted to a minimum of 90 percent of the maximum dry density as determined by the ASTM D 1557 test method, except that the upper 12 inches of backfill in pavement areas should be compacted to at least 95 percent.

Public agency requirements that exceed those listed above should govern where applicable.

5.4 FOUNDATIONS

5.4.1 Spread Foundations

The Vacuum Pit, Wash Station, and Material Storage structures can be supported on conventional shallow spread foundations bearing on materials prepared as recommended in this report. Continuous foundations should be at least 12 inches wide and isolated foundations at least 18 inches wide, with the bases extending a minimum of 18 inches below the lowest final adjacent grade. The bases of all foundations should be located below an imaginary 2H:1V (horizontal:vertical) plane projected up from the bottom of adjacent foundations, retaining walls, parallel utility trenches or open excavations.

Spread foundations can be designed to impose a net bearing pressure of 2,000 psf, dead plus live load. The allowable bearing pressure can be increased by one-third for wind and seismic loads if allowed by applicable building codes.

Ultimate resistance to spread foundation lateral forces can be developed from passive pressures against sides of foundations, and friction along bottoms of foundations, using the following criteria for design:

Coefficient of Friction	=	0.25
Passive Pressures	=	300 pcf equivalent fluid pressure **

** Neglect top 12 inches of material unless paved or covered with concrete flatwork in front of the foundation for a distance of at least 5 feet.

5.4.2 Pier Foundations

The Soundwall and the Wash Station structure can be supported on drilled piers (if shallow spread foundations are not preferred for the Wash Station structure). Drilled cast-in-place reinforced concrete piers should be at least 18 inches in diameter. Piers should extend at least 6 feet below lowest adjacent grade and at least 1 foot into medium dense silts or sands. Required pier depths and diameters should be calculated by the project structural engineer using the criteria presented below. Wash Station structure piers should be interconnected structurally (e.g., by grade beams).

Design of pier foundations should neglect the top 1.5 feet of existing soils unless they are replaced with engineered fill.

Piers can impose a passive equivalent fluid pressure of 250 pounds per square foot per foot (psf/ft) acting over 2 pier diameters, and vertical dead plus code live loads of 3,000 psf in end bearing. Piers should be spaced no closer than 4 pier diameters (center to center). These values may be increased by 1/3 for seismic and wind loads. Uplift should be resisted by dead load alone; soil/pier friction should be neglected when computing uplift resistance of piers.

Due to the end-bearing nature of the piers, it is critical that the bottoms of the pier holes be thoroughly cleaned of loose materials. Provision for cleaning holes using other than the drill's flight auger should be provided (e.g., bucket auger, vacuum, etc.).

Caving of loose sandy soils may necessitate casing of the holes and provisions for casing should be made by the contractor. The piers should be poured on the same day they are drilled to reduce the potential for drying and slaking of the sides of the pier holes.

The materials encountered in pier excavations should be evaluated by our representative in the field during drilling. Drill spoils should be removed from the site or placed as engineered fill. The pier excavations should be observed by a representative of Paragon Geotechnical, Inc. immediately before concrete placement to confirm that the bottoms of the holes have been, and remain adequately cleaned.

5.5 LATERAL EARTH PRESSURES

The following recommendations are for undrained, cast-in-place concrete retaining walls of the Vacuum Pit structure. Retaining walls should be supported on continuous spread foundations designed in accordance with the recommendations presented in this report (Section 5.4), and should be designed to resist the following lateral earth pressures:

- Free-standing walls (i.e., free to rotate at least one-quarter percent of the wall height) should be designed to withstand an active lateral earth pressure of 95 pounds per square foot/foot (psf/ft) for level backfill.
- Walls that are restrained from sufficient movement at the top to achieve active conditions should be designed to resist an at-rest lateral earth pressure of 120 psf/ft for level backfill.

In addition to lateral earth pressures, retaining walls must be designed to resist horizontal pressures that may be generated by surcharge loads applied at the ground surface behind the walls. Where an imaginary 1-1/2H:1V plane projected downward from the base from the outermost edge of a surcharge load intersects a retaining wall, that portion of the wall below the intersection should be designed for an additional uniform horizontal pressure equal to 0.40 (active condition) or 0.55 (at-rest condition) times the maximum vertical surcharge load.

Where moisture migration through retaining walls would be detrimental or undesirable, the walls should be waterproofed as specified by the project architect or structural engineer.

Retaining walls will yield slightly during backfilling; therefore wall backfill should be placed prior to building onto or adjacent to the walls. Compaction within 3 feet of the back of retaining walls should be performed only with hand-operated equipment to avoid overstressing the walls, and the walls should be properly braced during backfill operations.

5.6 PAVEMENT

5.6.1 Subgrade and Aggregate Base

It is our understanding that portions of the site are to be paved with Asphalt Concrete (AC) and/or Portland Cement Concrete (PCC). Based on an R-value test performed on a sample of the site soils anticipated to be representative of the pavement subgrade, an R-value of 12 was used for pavement design.

Pavement subgrade should be prepared as described Section 5.3 of this report. **Final moisture conditioning and compaction of pavement subgrade should be performed after the underground utilities have been installed and completely backfilled, and – unless chemical treatment is used – immediately prior to placement of the Aggregate Base (AB).**

All AB beneath pavements should be moisture conditioned as necessary and compacted to a minimum relative compaction of 95 percent based on the ASTM D 1557 test method. Subgrade should be stable (not pumping/yielding) at the time AB is placed. AB should meet the requirements for Caltrans Class 2 AB (current Caltrans Standard Specifications). Prior to delivery of AB to the site, the contractor should submit to PGI for approval, certification that the AB meets Caltrans Class 2 requirements.

The performance of pavement is highly dependent on uniform and properly compacted subgrade, as well as proper compaction of trench backfill within the limits of the pavement. All earthwork within pavement areas should be performed in accordance with the recommendations contained in this report.

All pavement surfaces should have a minimum slope of 1 percent (away from structures) to reduce water infiltration and subsequent saturation of the subgrade.

5.6.2 Asphalt Concrete (Flexible) Pavement

The project civil engineer should design the Asphalt Concrete (AC) pavement based on Caltrans guidelines (2010). Materials, quality and construction of the structural pavement section should, at a minimum, conform to applicable provisions of the current Caltrans Standard Specifications.

The Caltrans Gravel Equivalency method (Caltrans, 2012) was used to develop the structural section recommendations for AC pavement. The following table presents recommended sections for AC pavements:

Recommended Flexible Pavement Sections

Traffic Index	Flexible Pavement (inches)	
	AC	AB
4.0	2.5	6.5
4.5	2.5	8.0
5.0	3.0	8.5
5.5	3.0	10.5
6.0	3.0	12.5

5.6.3 Portland Cement Concrete (Rigid) Pavement

The project civil engineer should design the Portland Cement Concrete (PCC) pavement based on American Concrete Pavement Association’s (ACPA) guidelines (ACPA, 2006). Materials, quality and construction of the PCC pavement section should, at a minimum, conform to applicable provisions of the ACPA guidelines. Construction plans should include specifications and/or details pertaining to the following:

- jointing types, depths, and spacing;
- dowels and/or reinforcing; and
- concrete minimum strength and maximum water-to-cement ratio

The ACPA’s guidelines were used to develop PGI’s structural sections for PCC pavement). PGI’s recommended PCC pavement thicknesses assume use of concrete with a 28-day compressive strength of 4,000 psi.

The PCC section thicknesses herein assume jointed plain concrete pavement, which does not require reinforcement and relies on aggregate interlock for load transfer at section joints. **Where aggregate interlock is not provided (e.g., at construction joints), the pavement designer should incorporate an alternative load transfer feature (e.g., dowels).** However, steel reinforcement and a thicker section are recommended for both the Vacuum Pit, Material Storage and Wash Station structures as the loading condition in these areas is considered relatively very high. Steel reinforcement is also recommended for drainage swales due to the generally wetter (and therefore softer/weaker) subgrade conditions and slender PCC pavement element.



The following table presents recommended sections for PCC pavements:

Recommended Rigid Pavement Sections

Area (note)	Rigid Pavement (inches)		Reinforcement (on-center both ways)
	Concrete	AB	
Site	6.5	6.0	Optional: #4 bars @ 18-in.
Vacuum Pit Material Storage Wash Station Drainage Swales	7.0	6.0	Recommended: #4 bars @ 12-in.

- 1 – Assumes Average Daily Truck Traffic (ADDT) = 3.
- 2 – Minimum of 3 longitudinal bars for drainage swales.

5.6.4 High Stress Areas

Due to summer heating, high wheel loads combined with shear stresses induced by sharply turned tires can cause failure in flexible (AC) pavement. The use of rigid (PCC) pavement in areas subject to high wheel loads (e.g., drive inlets, in front of trash enclosures) can prolong the life of pavement in these areas. The transition between rigid and flexible pavements can be problematic with respect to pavement durability. To increase the durability of the AC pavement at the transition, the edge of the AC pavement (where it meets the PCC pavement) can be gradually thickened by an additional two inches beginning two feet back from the transition.

5.7 STORM WATER DETENTION/INFILTRATION

The dense (sometimes cemented) sandy soils and clay soils at the site are judged to likely have low to very low permeability, and in PGI’s opinion, preclude the use of common on-site storm water infiltration system to percolate water into the ground efficiently. Furthermore, any action that creates moisture content changes within the clay soils will increase the likelihood of potentially damaging ground movements due to shrink/swell behavior.

If an on-site storm water detention/infiltration system is planned for the project, the detention/infiltration facility should be located as far from structures as possible, but not closer than 20 horizontal feet. **The system should be designed in a manner that does not introduce water beneath structure slab or foundations.** The infiltration of water into pavement subgrade may result in reduced performance of AC and concrete pavements; particularly in fine-grained (clayey or silty), and the dense granular and cemented materials found in our borings.



PGI does not guarantee or provide any assurance that structure foundations, site pavements or flatwork will perform to an acceptable standard in the event of subgrade saturation from a storm water infiltration system. If on-site storm water detention/infiltration is planned for the project, PGI should review the proposed system(s) and make additional recommendations as appropriate.

5.8 LANDSCAPING AND IRRIGATION

We recommend that landscaping be kept at least 5 feet away from the perimeter of structure foundations, and that in general, landscaping consist primarily of drought-tolerant vegetation. Landscape irrigation should be controlled at all times to apply only the amount of water necessary to maintain plant vigor. Landscape strips should be designed to minimize drainage beneath pavements and/or structure foundations.

5.9 SURFACE DRAINAGE/EROSION CONTROL

Drainage around structures should be constructed in a way such that soils near the structures do not become saturated. Positive drainage should be provided away from foundations, slopes and retaining walls. Ponding of surface water should not be allowed. All downspouts and area drains should convey water at least 5 feet from the perimeter of structures, and away from slopes and walls, or be tied into approved outlets. Downspouts, surface drains and drainage swales should be checked for blockages and cleared and maintained on a regular basis.

Erosion control measures should be implemented for all exposed surfaces which may be subject to soil erosion; particularly slopes. In general, all construction surfaces should be graded to drain to prevent water from ponding.

5.10 PLAN REVIEW AND CONSTRUCTION OBSERVATION

The conclusions and recommendations contained in this report are contingent upon Paragon Geotechnical, Inc. being retained to review project plans and specifications to evaluate if they are consistent with our recommendations. They are also contingent upon Paragon Geotechnical, Inc. being retained to provide intermittent observation, and appropriate field and laboratory testing during site preparation, grading, fill placement and final subgrade preparation to evaluate if the subsurface conditions are as anticipated and to check for conformance with our recommendations.

If the subsurface conditions are observed to be different from those described in this report, we should be notified immediately so that the changed conditions can be evaluated and our recommendations revised, if appropriate. The recommendations in this report are contingent upon our notification and review of changed conditions.

We should be notified a minimum of 48 hours before the start of construction requiring our observation, and upon resumption after interruptions. These services are performed on an as-requested basis and are in addition to this geotechnical investigation. We cannot provide comment on conditions, situations or stages of construction that we are not notified to observe.

6.0
LIMITATIONS

This report was prepared solely for the exclusive use of Domenichelli & Associates (the Client) and its consultants for the proposed project described in this report. No other entity or person shall use or rely upon this report, or any of Paragon Geotechnical, Inc.'s work products, unless expressly authorized by us.

Our services consist of professional opinions and conclusions developed in accordance with generally accepted geotechnical engineering principles and practices. There is no warranty, either expressed or implied. Our conclusions and recommendations are based on the information provided to us regarding the proposed construction, the results of our field investigation and laboratory testing programs, and professional judgment. Verification of our conclusions and recommendations is subject to our review of the project plans and specifications, and our observation of construction.

The exploratory boring logs represent subsurface conditions at the locations, and on the dates indicated. They are not warranted to be representative of subsurface conditions at other locations or at other times. Descriptions of site conditions and features presented in this report are those that existed at the time of our field exploration and they may differ at other times. The locations of our exploratory borings were established in the field based on distances to existing features and are approximate.

This report is considered valid for the proposed project for a period of 24 months from the report date provided that the site conditions and development plans remain unchanged. With the passage of time, changes in the conditions of a property can occur due to natural processes or the works of man on this or adjacent properties. Legislation or the broadening of knowledge may result in changes in applicable standards. In such a case, we should review this report to determine the applicability of the conclusions and recommendations considering the time elapsed and/or changed conditions. The recommendations in this report are contingent upon such a review.

Our scope of services was limited to the proposed work described in this report, and did not address other items or areas. Our scope of services did not include environmental site assessments or an investigation of the presence or absence of hazardous, toxic or corrosive (beyond the testing described in this report) materials in the soil, surface water, ground water or air, on or below, or around the site. Our scope of services did not include an evaluation or investigation of the presence or absence of wetlands. Our scope of services did not include an evaluation or mitigation of the presence of mold at the site.

7.0
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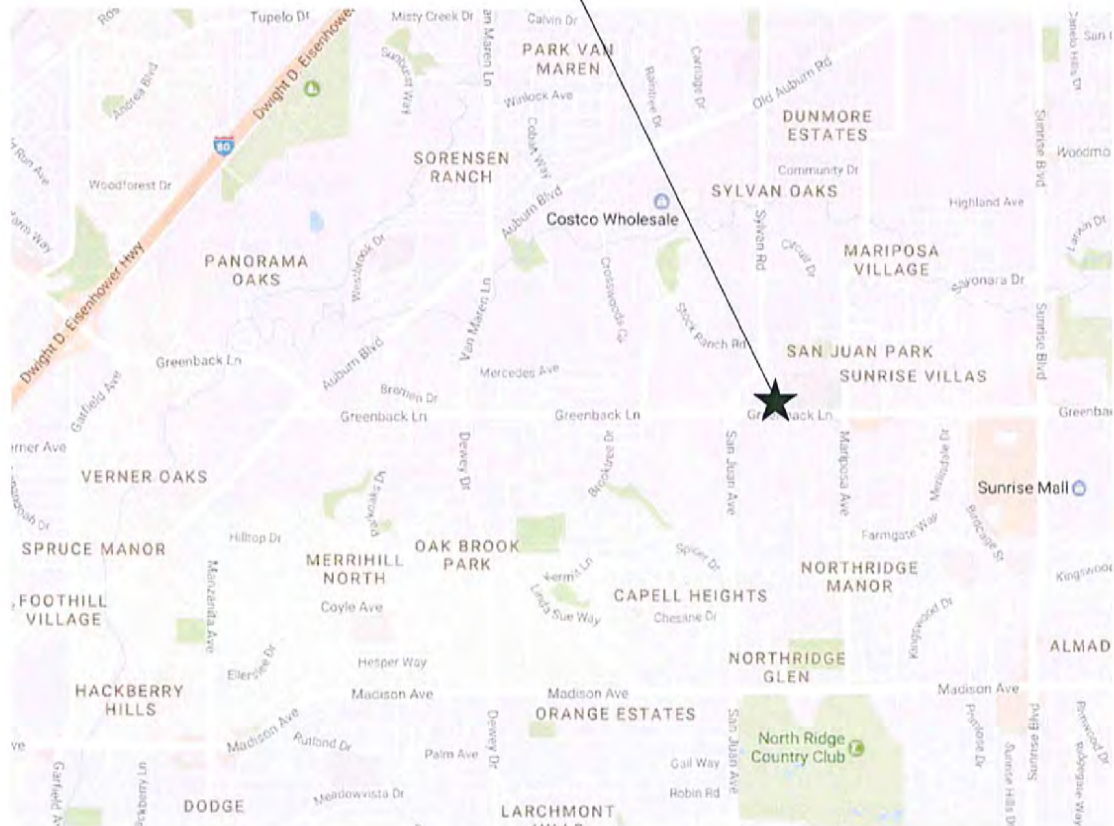
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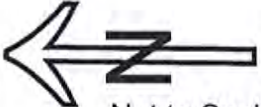
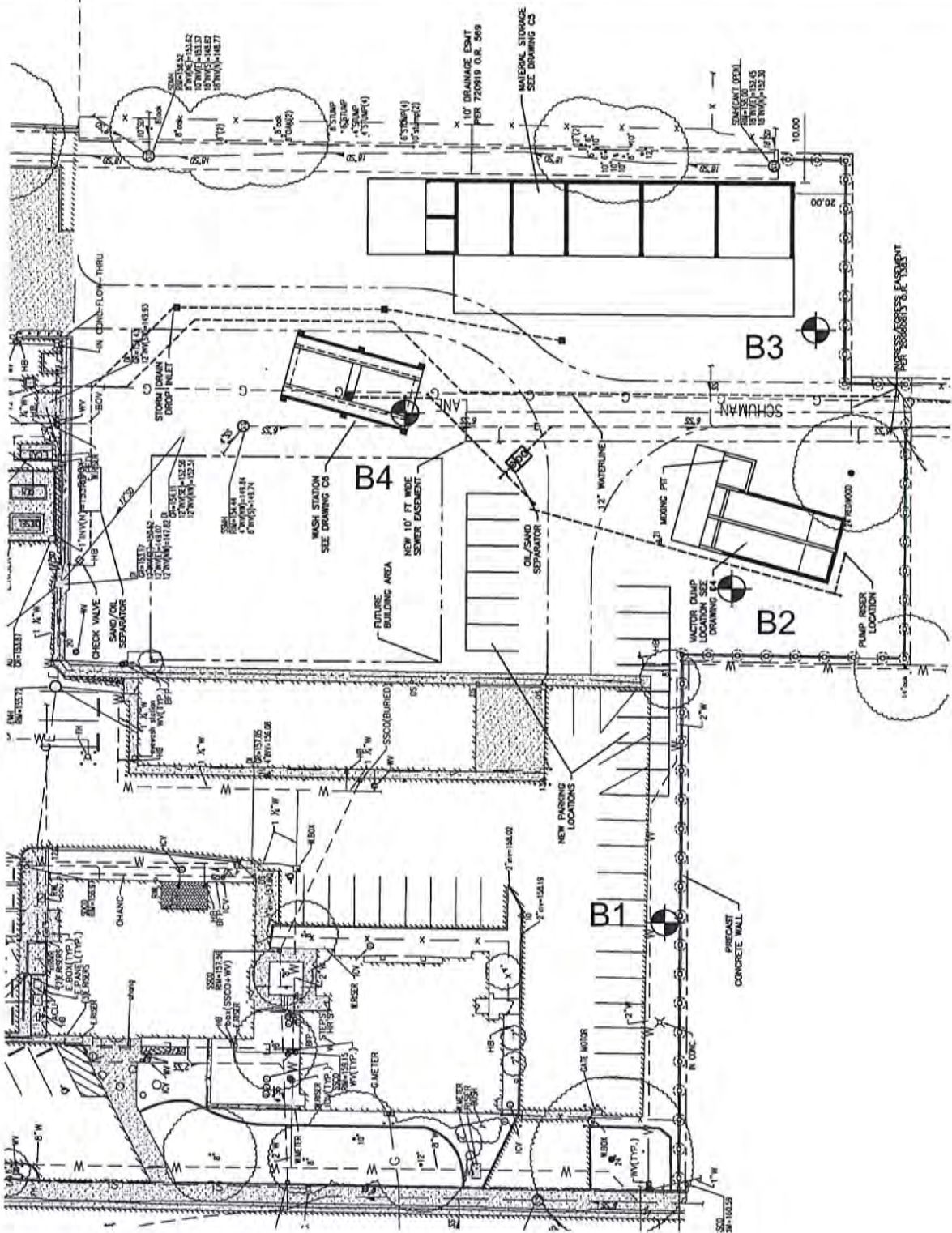
Site



Project No.: 1658-01-16
Reviewed: RW
Drawn: DD
Date: January 2017

VICINITY MAP
CHWD Corp. Yard Master Plan Ph. 1
Citrus Heights, California

PLATE
1



Not to Scale



B1 - Approximate Boring Location

Source: Renovation Site Plan, sheet C2, dated 11/07/2016, provided by Domenichelli & Associates on 9/30/2016.



Project No.: 1658-01-16
 Reviewed: DD
 Drawn: RW
 Date: January 2017

BORING PLAN

CHWD Corp. Yard Master Plan Ph. 1
 6230 Sylvan Road
 Citrus Heights, California

PLATE
















2

APPENDIX A
FIELD INVESTIGATION








Three exploratory borings were drilled on January 17, 2017 at the approximate locations shown on the attached boring location plan (Plate 2). The borings were drilled to depths of approximately 16 to 20 feet below existing grade under the supervision of our senior engineer utilizing a CME-55 truck-mounted drill rig equipped with 4-inch-diameter flight augers. Upon completion of drilling the borings were backfilled with drill cuttings.

During drilling, representative samples were obtained using California (2.5-inch I.D.) and Standard Penetration Test - SPT (1.5-inch I.D.) split- spoon samplers. The samplers were driven into the soil a distance of 18 inches using a 140-pound hammer dropped from a height of 30 inches. The number of blows required for each 6-inch increment of sampler drive was recorded. The California sampler blow counts were correlated to the equivalent SPT blow counts. The blow count for each 6-inch drive, and the cumulative blow count for the last 12 inches of drive, or fraction thereof, presented on the boring logs represent the number of SPT (or correlated) blows required to drive the sampler.

Logs of the borings were prepared based on the field logging, visual examination of the samples in the laboratory and the results of laboratory testing. The soils encountered are described in accordance with the criteria presented in Plate A-1. Logs of the exploratory borings are presented in Plates A-2 through A-5. The logs depict our interpretation of the subsurface conditions found in the borings on the date and at the depth indicated. The stratification lines on the logs represent approximate boundaries between soil types, and the actual transitions may be gradual.

MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS More Than Half > #200 Sieve	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW 	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP 	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM 	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC 	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW 	WELL GRADED SANDS, GRAVEL SAND-MIXTURES
			SP 	POORLY GRADED SANDS, GRAVEL-SAND MIXTURES
		SANDS WITH OVER 12% FINES	SM 	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC 	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS More Than Half < #200 Sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML 	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL 	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL 	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH 	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH 	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH 	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt 	PEAT AND OTHER HIGHLY ORGANIC SOILS

UNIFIED SOIL CLASSIFICATION SYSTEM

	Standard Penetration Test (1-3/8-inch I.D.)	UU-Tx	Unconsolidated Undrained Triaxial Shear
	Modified-California Sampler (2-inch I.D.)	UU-Tx Sat	Unconsolidated Undrained Triaxial Shear saturated prior to test
	California Sampler (2-1/2-inch I.D.)	CU-Tx	Consolidated Undrained Triaxial Shear
	Shelby Tube (3-inch I.D.)	UC	Unconfined Compressive Strength
	Bulk Sample	DS	Unconsolidated Undrained Direct Shear
	Water Level Measured At Time Of Drilling	Consol	Consolidation
	Water Level Measured After Specified Time	EI	Expansion Index
Rval	Rvalue Test	FS	Free Swell
SE	Sand Equivalent	Perm	Permeability
DI	Durability Index	MPC	Modified Proctor Compaction Curve
CE	Corrosivity Evaluation	SPC	Standard Proctor Compaction Curve

KEY TO TEST DATA

MATERIAL DESCRIPTION

MATERIAL DESCRIPTION	Depth	USCS Classification	Graphic Log	Sample Type	Sample Number	Blows/6" or Avg Push Press (psi)	N Value*	Water Content (%)	% Passing No. 200 Sieve
Brown silty sand (SM), wet, medium dense, locally weakly cemented, fine.	0								
	1	SM		CA	1	3 5	13	27.9	75.1
Light brown sandy silt (ML), moist, medium dense, fine.	2					8			
	3	ML		SS	2	3 5	13		
Light brown silty sand (SM), moist, medium dense, fine.	4					8			
As above.	5					7			
	6			SS	3	8 8	16	12.6	19.6
	7								
	8								
	9	SM							
As above.	10					8			
	11			SS	4	10 15	25	18.5	61.0
	12								
	13								
	14								
Light brown silt (ML) with fine sand, moist, dense, fine.	15					11			
	16	ML		SS	5	17 29	46		
Boring terminated.	17								
	18								
	19								
	20								

Start Date: 1/17/2017	Finish Date: 1/17/2017
Drilling Method: 4-inch Flight Auger	Drilling Contractor: Geo-Ex
Drill Rig: CME55 AT	Hammer Type: CME Auto-trip
Logged By: D. Dean	Reviewed By: R. Wentz
	Elevation: **

Comments:

* Converted to equivalent standard penetration blow counts.
 ** Existing ground surface at time of drilling.

PG COMMON PLATE A-X 1658-01-16.GPJ SOIL BORING.GDT 1/31/17



Project No.: 1658-01-16
 Reviewed by: R. Wentz
 Drawn by: D. Dean
 Date: 1/31/2017

LOG OF BORING 1
 CHWD Corp. Yard Master Plan Ph. 1
 Citrus Heights, CA

PLATE
A-2

MATERIAL DESCRIPTION

MATERIAL DESCRIPTION	Depth	USCS Classification	Graphic Log	Sample Type	Sample Number	Blows/6" or Avg Push Press (psi)	N Value*	Water Content (%)	% Passing No. 200 Sieve	Liquid Limit	Plasticity Index	Other Laboratory Tests
Brown silty sandy gravel (GM), moist, medium dense, fine to coarse ssand, gravel to 3/4-inch, angular (FILL). -- FILL --	0 - 2	GM										
Brown lean clay (CL), moist, medium stiff.	2 - 3	CL		SS	1	6	14	13.7	58.0	29	16	CE
	3 - 4			BK	A	8						
Brown silty clayey sand (SC/SM), moist, dense, fine to medium.	4 - 5			CA	2	8						
	5 - 8	SC SM				15 29	44	13.8	30.4			
Light brown to light gray sand with silt (SM), moist, medium dense, fine.	8 - 10			SS	3	7	20					
	10 - 12	SM				9 11						
Light brown silt (ML) with sand, moist, very dense, fine, locally weakly cemented.	12 - 15											
	15 - 16	ML		SS	4	15 25	50+					
Boring terminated.	16 - 20					25/2"						

Start Date: 1/17/2017	Finish Date: 1/17/2017
Drilling Method: 4-inch Flight Auger	Drilling Contractor: Geo-Ex
Drill Rig: CME55 AT	Hammer Type: CME Auto-trip
Logged By: D. Dean	Reviewed By: R. Wentz
	Elevation: **

Comments:

* Converted to equivalent standard penetration blow counts.
 ** Existing ground surface at time of drilling.

PG COMMON PLATE A-X 1658-01-16.GPJ SOIL BORING.GDT 1/31/17



Project No.: 1658-01-16
 Reviewed by: R. Wentz
 Drawn by: D. Dean
 Date: 1/31/2017

LOG OF BORING 2
 CHWD Corp. Yard Master Plan Ph. 1
 Citrus Heights, CA

PLATE
A-3

PG COMMON PLATE A-X 1658-01-16.GPJ SOIL BORING.GDT 1/31/17

MATERIAL DESCRIPTION	Depth	USCS Classification	Graphic Log	Sample Type	Sample Number	Blows/6" or Avg Push Press (psi)	N Value*	Water Content (%)	% Passing No. 200 Sieve
Brown gravelly silty sand (SM/GM), wet, loose, fine to coarse ssand, gravel to 3/4-inch, angular (FILL). -- FILL --	0 - 1	SM							
Brown silty sand (SM), wet, loose, fine.	1 - 3	SM		SS	1	2 3 4	7	15.0	48.0
Red-brown clayey sand (SC), moist, very dense, fine to medium.	3 - 8	SC		CA	2	8 25 25/2"	50+	13.4	31.4
Light gray sand (SM) with silt, dry, dense.	8 - 13	SM		SS	3	8 15 21	36		
Light brown silt (ML), moist, very dense.	13 - 15	ML		SS	4	15 25/3"	50+		
Boring terminated.	15 - 20								

Start Date: 1/17/2017	Finish Date: 1/17/2017
Drilling Method: 4-inch Flight Auger	Drilling Contractor: Geo-Ex
Drill Rig: CME55 AT	Hammer Type: CME Auto-trip
Logged By: D. Dean	Reviewed By: R. Wentz
	Elevation: **

Comments:

* Converted to equivalent standard penetration blow counts.
 ** Existing ground surface at time of drilling.



Project No.: 1658-01-16
 Reviewed by: R. Wentz
 Drawn by: D. Dean
 Date: 1/31/2017

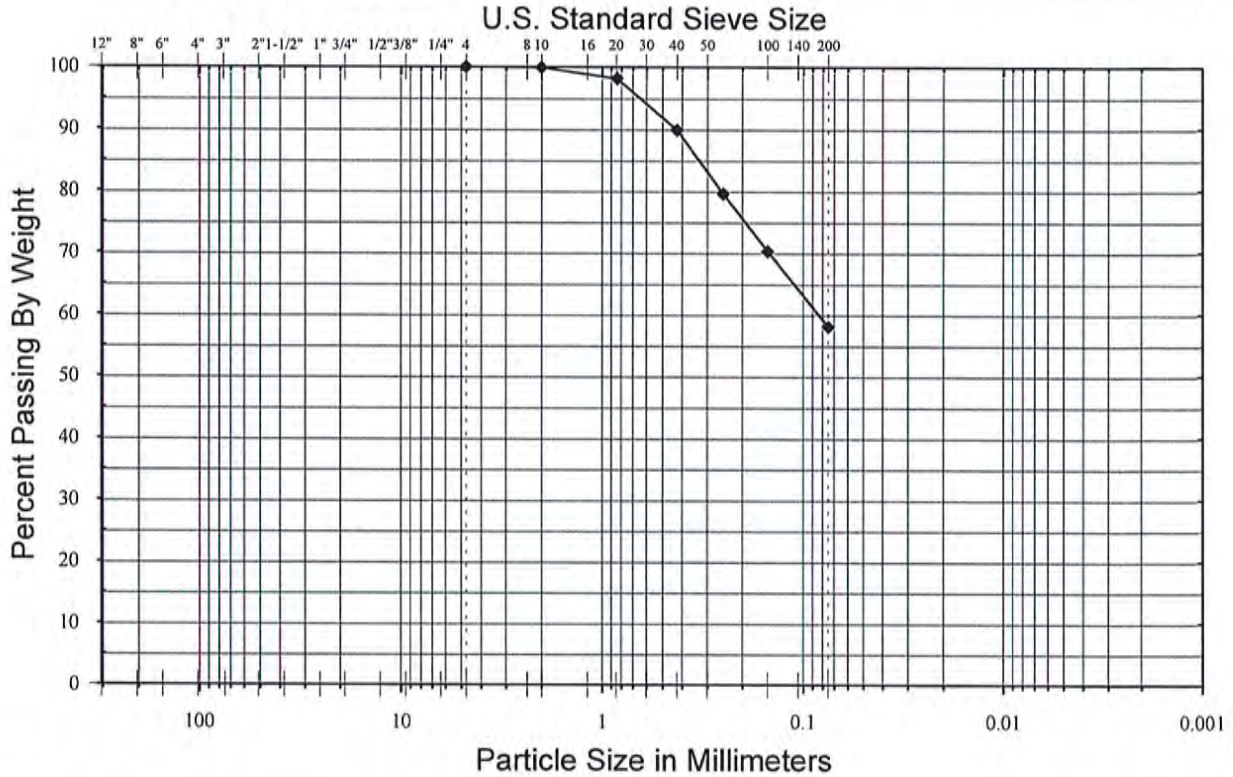
LOG OF BORING 3
 CHWD Corp. Yard Master Plan Ph. 1
 Citrus Heights, CA

PLATE
A-4

APPENDIX B
RESULTS OF LABORATORY TESTING

Particle-Size Distribution

COBBLE	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
0.0%	0.0%	0.0%	0.1%	10.1%	31.8%	58.0%



Sample No.: B2 1 Sample Depth: 3.0 - 4.0 ft.
 Sample Description: Brown sandy clay (CL)

Particle Size Coefficients

D₁₀: D₁₅: D₃₀:
 D₅₀: D₆₀: 0.09 D₈₅: 0.35
 C_u: C_c:

Atterberg Limits

LL: 29 PL: 12 PI: 13

Sieve No. / Particle Size	Percent Passing
8"	
6"	
4"	
3"	
2"	
1-1/2"	
1"	
3/4"	
1/2"	
3/8"	
#4	100.0
#8	--
#10	99.9
#16	--
#20	98.1
#40	89.8
#60	79.5
#100	70.2
#200	58.0

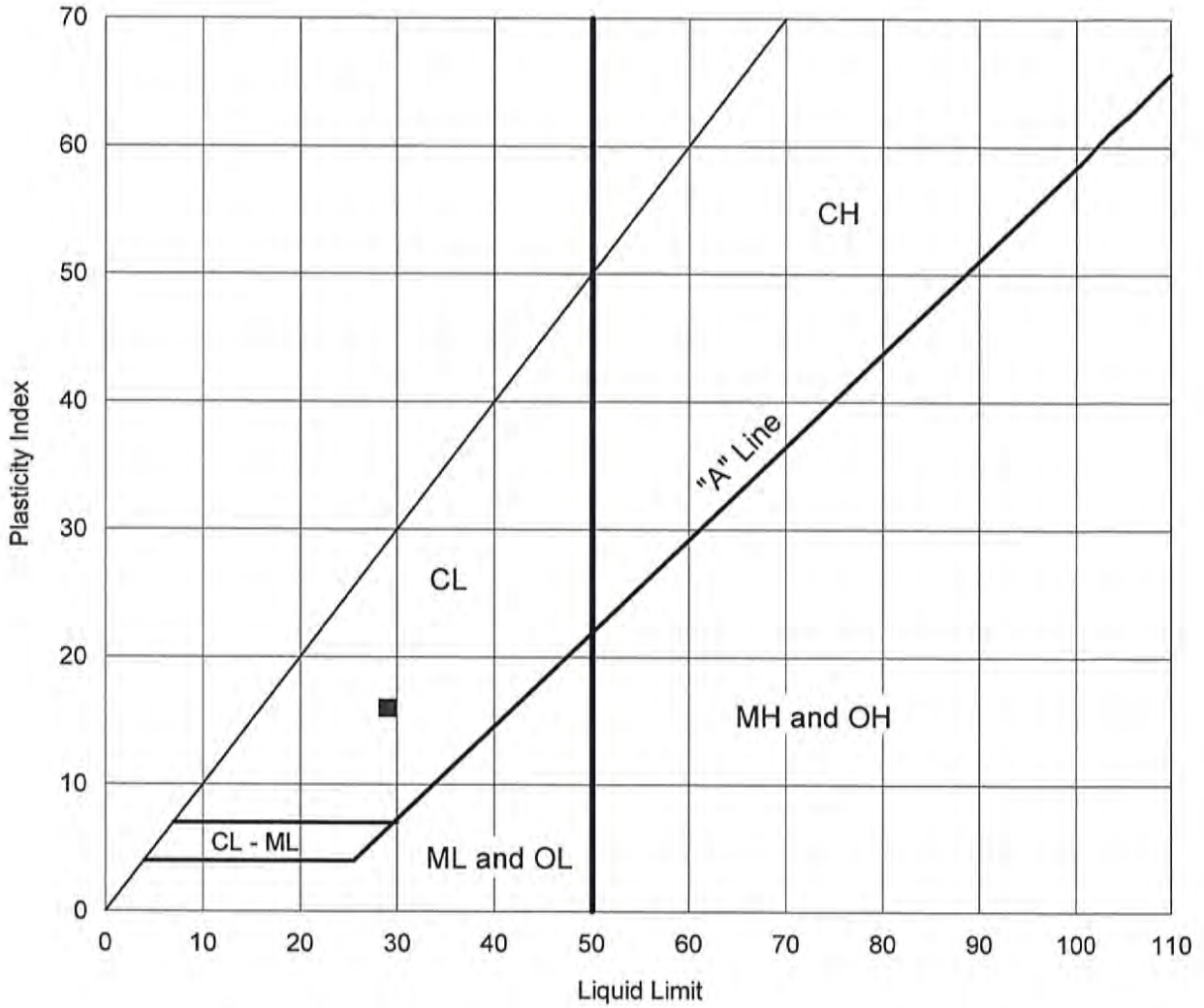


Project No.: 1658-01-16
 Tested By: GC
 Test Date: January 2017
 Reviewed By: DD

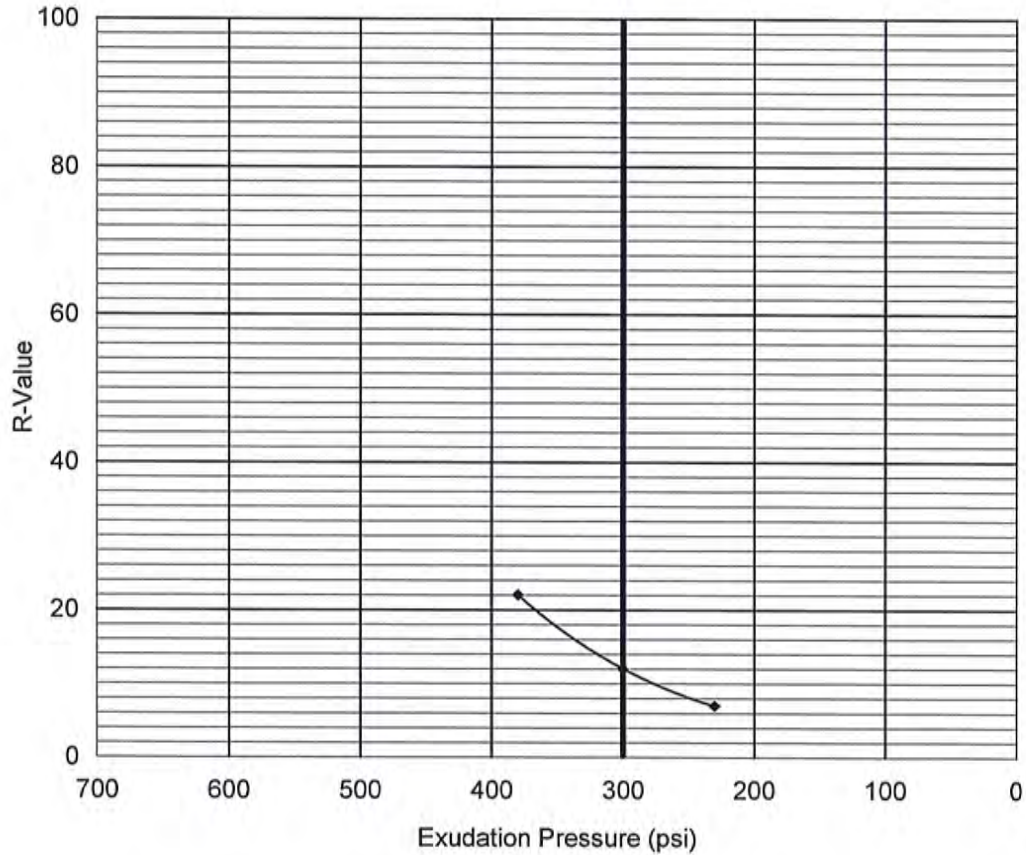
PARTICLE SIZE DATA

CHWD Corp. Yard Master Plan Ph. 1
 Citrus Heights, California

PLATE
B-1



SYMBOL	SAMPLE NO.	DEPTH (FT.)	NATURAL MOISTURE CONTENT (%)	ATTERBERG LIMITS		% PASSING NO. 200 SIEVE	UNIFIED SOIL CLASSIFICATION SYMBOL
				Liquid Limit (%)	Plasticity Index (%)		
■	B2 1	3.0 - 4.0	13.7	29	16	58	CL



Specimen Number:	A	B	C	D
Moisture at Test (%)	16.4	15.4	14.5	
Dry Unit Weight at Test (pcf)	116.1	116.5	117.2	
Expansion Pressure (psi)	0	0	0	
Exudation Pressure (psi)	230	300	380	
Resistance Value	7	12	22	
			R-Value	12

NOTE: Bulk B

Sample Location: Boring B4
 Sample Depth: 1.0 - 2.0 ft
 Material Description: Brown silty fine sand (ML)



Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 01/25/2017
Date Submitted 01/20/2017

To: Dana Dean
Paragon Geotechnical, Inc. (Sac)
7979 Wente Way
Sacramento, CA 95829

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 1658-01-16 Site ID : BULK A.
Thank you for your business.

* For future reference to this analysis please use SUN # 73530-153391.

EVALUATION FOR SOIL CORROSION

Soil pH	7.70		
Minimum Resistivity	2.63	ohm-cm (x1000)	
Chloride	16.8 ppm	00.00168	%
Sulfate	130.2 ppm	00.01302	%

METHODS

pH and Min. Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sample Location: Boring B2
Sample Depth: 3.0 - 5.0 ft
Material Description: Brown sandy clay (CL)



Project No.: 1658-01-16
Reviewed: RW
Drawn: DD
Date: January 2017

CORROSION DATA

CHWD Corp. Yard Master Plan Ph. 1
Citrus Heights, California

PLATE
B-4



State of California - Department of Fish and Wildlife
2017 ENVIRONMENTAL FILING FEE CASH RECEIPT
 DFW 753.5a (Rev. 01/01/17) Previously DFG 753.5a

Print **Finalize&Email**

RECEIPT NUMBER:
 34 — 03222017 — 154
 STATE CLEARINGHOUSE NUMBER (if applicable)

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY.

LEAD AGENCY CITRUS HEIGHTS WATER DISTRICT	LEAD AGENCY EMAIL	DATE 03222017
COUNTY/STATE AGENCY OF FILING Sacramento	DOCUMENT NUMBER 170165	

PROJECT TITLE
CORPORATION YARD MASTER PLAN PHASE I IMPROVEMENT PROJECT

PROJECT APPLICANT NAME Citrus Heights Water District, Paul Dietrich Project Manager	PROJECT APPLICANT EMAIL	PHONE NUMBER (916) 725-6873
--	-------------------------	---------------------------------------

PROJECT APPLICANT ADDRESS 6230 Sylvan Road	CITY Citrus Heights	STATE CA	ZIP CODE 95611-0286
--	-------------------------------	--------------------	-------------------------------

PROJECT APPLICANT (Check appropriate box)

Local Public Agency
 School District
 Other Special District
 State Agency
 Private Entity

CHECK APPLICABLE FEES:

<input type="checkbox"/> Environmental Impact Report (EIR)	\$3,078.25	\$	<u>0.00</u>
<input type="checkbox"/> Mitigated/Negative Declaration (MND)(ND)	\$2,216.25	\$	<u>0.00</u>
<input type="checkbox"/> Certified Regulatory Program document (CRP)	\$1,046.50	\$	<u>0.00</u>

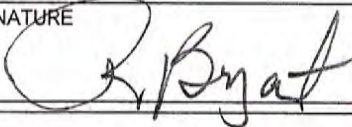
- Exempt from fee
 Notice of Exemption (attach)
 CDFW No Effect Determination (attach)
 Fee previously paid (attach previously issued cash receipt copy)

<input type="checkbox"/> Water Right Application or Petition Fee (State Water Resources Control Board only)	\$850.00	\$	<u>0.00</u>
<input checked="" type="checkbox"/> County documentary handling fee		\$	<u>40.00</u>
<input type="checkbox"/> Other		\$	<u> </u>

PAYMENT METHOD:

- Cash
 Credit
 Check
 Other

TOTAL RECEIVED \$ 40.00

SIGNATURE X 	AGENCY OF FILING PRINTED NAME AND TITLE Rosalyn Bryant-Deputy Clerk
---	---

Notice of Exemption

Appendix E

To: Office of Planning and Research
P.O. Box 3044, Room 113
Sacramento, CA 95812-3044
County Clerk
County of: Sacramento
600 8th Street, Room 101
Sacramento, CA 95814

From: (Public Agency): Citrus Heights Water District
6230 Sylvan Road
Citrus Heights, CA 95611-0286
(Address)

Project Title: Corporation Yard Master Plan Phase I Improvement Project

Project Applicant: Citrus Heights Water District

Project Location - Specific: Existing Corporation Yard adjacent to Citrus Heights Water District headquarters at 6230 Sylvan Road in the City of Citrus Heights.

Project Location - City: Citrus Heights Project Location - County: Sacramento

Description of Nature, Purpose and Beneficiaries of Project: Project would include new and improved facilities: a covered vehicular wash station, covered material storage areas, security/lighting, open vacuum excavation dump pits, and water, oil, and sand separation systems to connect with existing sewer. New truck access via existing easement would also connect to Greenback Lane.

Name of Public Agency Approving Project: Citrus Heights Water District

Name of Person or Agency Carrying Out Project: Paul Dietrich, Project Manager

Exempt Status: (check one):

- Ministerial (Sec. 21080(b)(1); 15268);
Declared Emergency (Sec. 21080(b)(3); 15269(a));
Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
[X] Categorical Exemption. State type and section number: Class 3, Sec 15303(c)(d)
Statutory Exemptions. State code number:

Reasons why project is exempt:

The Project would meet the provisions for Class 3 projects. The Project also would meet the criteria of no exceptions to the exemption: the project is not within a sensitive environment, the project would not have cumulative or significant impacts, the project would not damage scenic resources, the project is not located on an identified hazardous waste site, and the project would not cause an adverse change to a historical resource.

Lead Agency Contact Person: Paul Dietrich, Project Manager Area Code/Telephone/Extension: 916 725-6873

If filed by applicant:

- 1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? Yes No

Signature: Paul Dietrich Date: 3/21/17 Title: Project Manager

[X] Signed by Lead Agency [] Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR:

ENDORSED
SACRAMENTO COUNTY

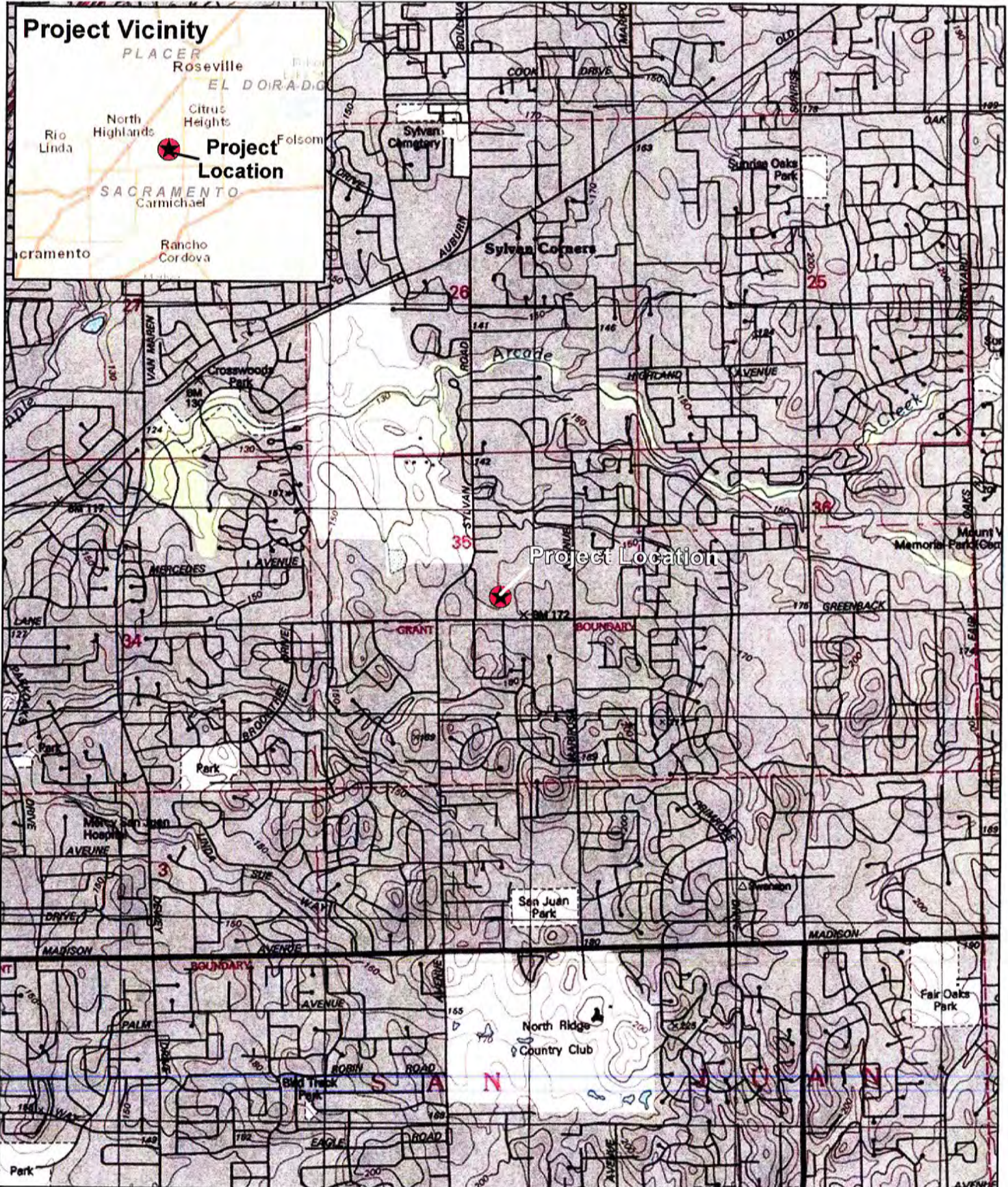
MAR 22 2017

DONNA ALLRED, CLERK/RECORDER
BY [Signature] DEPUTY

Project Vicinity



Project Location



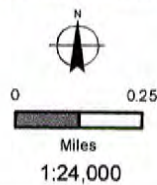
ENDORSED
SACRAMENTO COUNTY

Citrus Heights Water District
Corporation Yard
Phase 1 Improvements

MAR 22 2016

USGS 7.5 min. Topographic
Quadrangle: Citrus Heights
Township 10 North Range 6 East
Section 35
121°17'19.809"W 38°40'45.744"N
Sacramento County, California

BY *Donna Alford* CLERK/RECORDER
DEPUTY



EN2 Water and Energy
RESOURCES, INC. Consulting Services

Date: 11/30/2016

Notice of Exemption

Appendix E

To: Office of Planning and Research
P.O. Box 3044, Room 113
Sacramento, CA 95812-3044
County Clerk
County of: Sacramento
600 8th Street, Room 101
Sacramento, CA 95814

From: (Public Agency): Citrus Heights Water District
6230 Sylvan Road
Citrus Heights, CA 95611-0286
(Address)

Project Title: Corporation Yard Master Plan Phase I Improvement Project

Project Applicant: Citrus Heights Water District

Project Location - Specific: Existing Corporation Yard adjacent to Citrus Heights Water District headquarters at 6230 Sylvan Road in the City of Citrus Heights.

Project Location - City: Citrus Heights Project Location - County: Sacramento

Description of Nature, Purpose and Beneficiaries of Project: Project would include new and improved facilities: a covered vehicular wash station, covered material storage areas, security/lighting, open vacuum excavation dump pits, and water, oil, and sand separation systems to connect with existing sewer. New truck access via existing easement would also connect to Greenback Lane.

Name of Public Agency Approving Project: Citrus Heights Water District

Name of Person or Agency Carrying Out Project: Paul Dietrich, Project Manager

Exempt Status: (check one):

- Ministerial (Sec. 21080(b)(1); 15268);
Declared Emergency (Sec. 21080(b)(3); 15269(a));
Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
[X] Categorical Exemption. State type and section number: Class 3, Sec 15303(c)(d)
Statutory Exemptions. State code number:

Reasons why project is exempt:

The Project would meet the provisions for Class 3 projects. The Project also would meet the criteria of no exceptions to the exemption: the project is not within a sensitive environment, the project would not have cumulative or significant impacts, the project would not damage scenic resources, the project is not located on an identified hazardous waste site, and the project would not cause an adverse change to a historical resource.

Lead Agency Contact Person: Paul Dietrich, Project Manager Area Code/Telephone/Extension: 916 725-6873

If filed by applicant:

- 1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? [] Yes [] No

Signature: Paul Dietrich Date: 3/21/17 Title: Project Manager

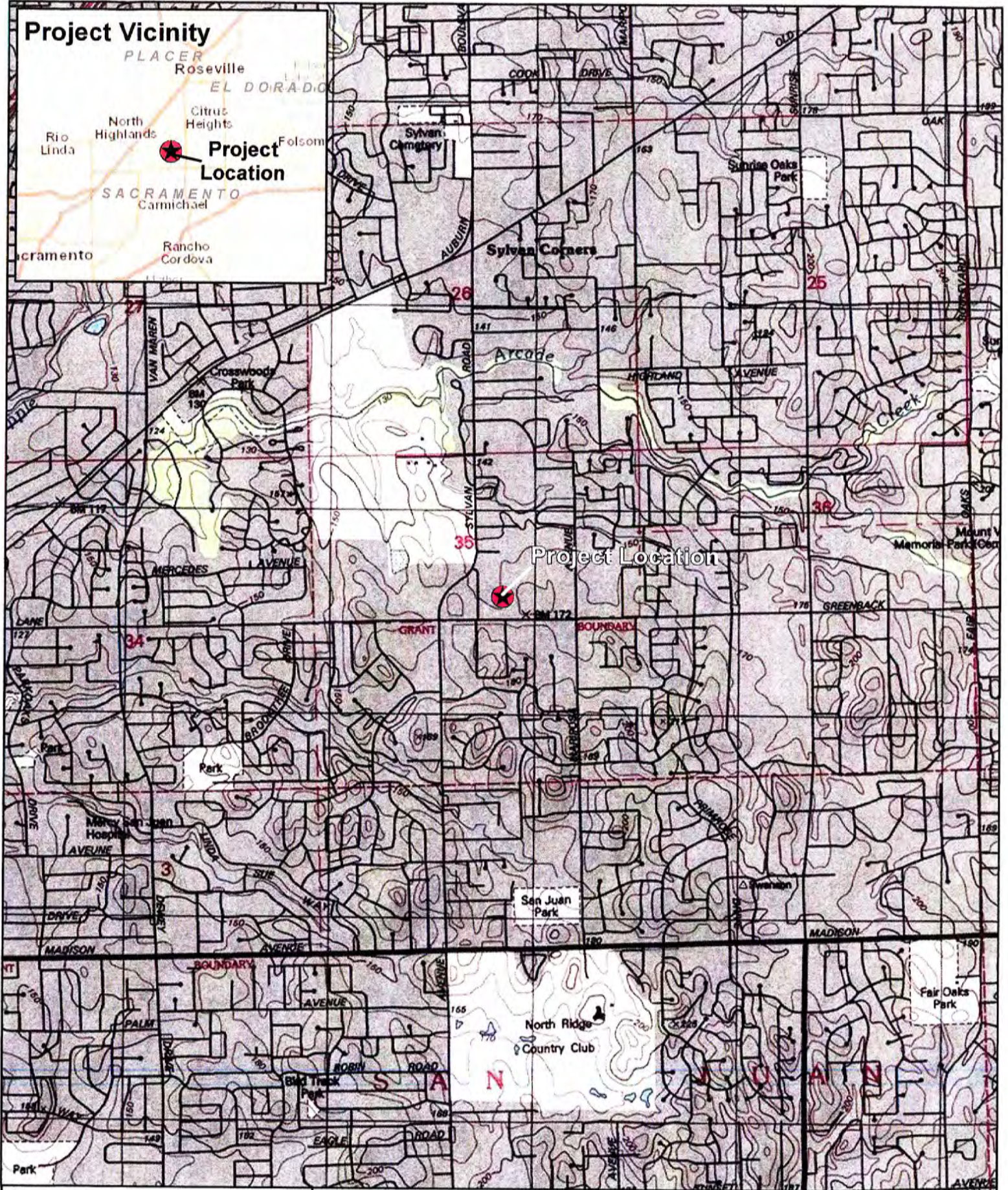
[X] Signed by Lead Agency [] Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR:

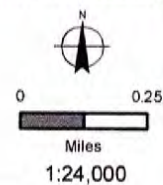
Governor's Office of Planning & Research
MAR 22 2017
STATE CLEARINGHOUSE

Project Vicinity



Citrus Heights Water District
 Corporation Yard
 Phase 1 Improvements

USGS 7.5 min. Topographic
 Quadrangle: Citrus Heights
 Township 10 North Range 6 East
 Section 35
 121°17'19.809"W 38°40'45.744"N
 Sacramento County, California



EN2 Water and Energy
 Consulting Services
RESOURCES, INC.

CITRUS HEIGHTS WATER DISTRICT
ENVIRONMENTAL INFORMATION FORM

1. **Project Name:** Corporation Yard Master Plan Phase I Improvement Project
2. **Project Number:** N/A
3. **Location of project:** Adjacent to Citrus Heights Water District headquarters at 6230 Sylvan Road in the City of Citrus Heights
4. **Assessor's Parcel Number (APN):** 243-0180-011, 243-0180-009, 243-0180-007, 243-0180-006, and 243-0180-005
5. **Description of Project:** The Project would include designing and constructing a covered vehicular wash station, two open vacuum excavation dump pits, and a new connection to sewer pipeline for wash station and dump pit water. Covered material storage areas for AB, sand, concrete and asphalt would also be constructed, parking and paving would be expanded, and site access and security would be improved. Water pipeline and drainage improvements, including an additional separation system for water, oil, and sand, would also be part of the Project. The Project area encompasses approximately 1.3 acres of land, is within an existing developed area of operations, and would be accessed via existing roadways.

6. **Which exemption might be appropriate for this project:**

- Ministerial (Sec 21080(b)(1); 15268);
- Declared Emergency (Sec 2080(b)(3); 15269(a));
- Emergency Project (Sec 21080(b)(4); 15269(b)(c));
- Categorical Exemption (Sec 15303(c)(d)):

Class 1 consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. The key consideration is whether the project involves negligible or no expansion of an existing use.

Class 2 consists of replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced.

Class 3 consists of construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure.

Class 4 consists of minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes.

Class 5 consists of minor alterations in land use limitations in areas with an average slope of less than 20%, which do not result in any changes in land use or density.

Statutory Exemption. State Code Reference: _____

CITRUS HEIGHTS WATER DISTRICT
ENVIRONMENTAL INFORMATION FORM

7. Anticipated Time Scheduling of Project:

Design initiated: October 17, 2016
Design completed: April 15, 2017
Construction Start: May 15, 2017
Construction Complete: November 13, 2017

8. Project Purpose and Beneficiaries: The layout of existing facilities does not provide the most efficient use of the space. Current areas do not have adequate lighting or security for use outside of regular working hours. Existing pits and storage areas are not in compliance with the most recent waste water environmental regulations.

9. Exceptions: In order to be included in a categorical exemption, a project must meet all the following criteria:

a. Location. Classes 3, 4, 5, 6, and 11 are qualified by consideration of where the project is to be located. A project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant. Therefore, these classes are considered to apply to all instances, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.

Meets
 Does not meet

b. Cumulative Impact. All exemptions for these classes are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant.

Meets
 Does not meet

c. Significant Effect. A categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.

See items 10 through 23 below.

d. Scenic Highways. A categorical exemption shall not be used for a project which may result in damage to scenic resources, including but not limited to, trees, historic buildings, rock outcroppings, or similar resources, within a highway officially designated as a state scenic highway. This does not apply to improvements which are required as mitigation by an adopted negative declaration or certified EIR.

Meets
 Does not meet

e. Hazardous Waste Sites. A categorical exemption shall not be used for a project located on a site which is included on any list compiled pursuant to Section 65962.5 of the Government Code.

Meets
 Does not meet

f. Historical Resources. A categorical exemption shall not be used for a project which may cause a substantial adverse change in the significance of a historical resource.

Meets
 Does not meet

CITRUS HEIGHTS WATER DISTRICT
ENVIRONMENTAL INFORMATION FORM

Complete numbers 10 through 23 by marking "A" through "D" and briefly discuss any items marked "A" "B" or "C" (attach additional sheets as necessary). Items marked "D" do not need discussion.

- A. Potentially Significant
- B. Potentially Significant Unless Mitigated
- C. Less than Significant
- D. No Impact

10. Aesthetics: Would the proposed project:

- D a. Affect a scenic vista?
- C b. Have a demonstrable negative aesthetic effect?
- D c. Create light or glare?

Discussion: Prior tree removal within the project site removed a small amount of tree canopy/visual screening, but will not substantially affect the aesthetics of the site. Proposed Project activities would not negatively affect aesthetics by conflicting with any established recreation, religious, education, or scientific uses of the area. The project would not conflict with aesthetic considerations in promoting tourism. Project activities would not create light or glare.

11. Air Quality: Would the proposed project:

- C a. Affect air quality or contribute to an existing or projected air quality violation?
- D b. Create or cause smoke, ash, or fumes in the vicinity?
- C c. Create objectionable odors?

Discussion: Project grading activities would temporarily result in small amounts of elevated heavy equipment emissions and fugitive dust emissions. Operations would generate minor amounts of fugitive dust associated with the materials storage containers, which would be offset by extending pavement in the areas of material storage, thereby lessening the amount of dust emissions during operations.

12. Biological Resources: Would the proposed project:

- C a. Remove any existing trees or landscaping?
- D b. Affect area in or adjacent to an area of undisturbed, unique, or high quality habitat?
- D c. Affect area on or adjacent to wildlife migration routes?

Discussion: Eighteen trees (listed below) would be removed and a few other trees would be pruned for clearance. Much of the vegetation in the project site is non-native and/or invasive. The City of Citrus Heights ordinance specifies that native oak trees and other mature trees 19 inches or greater in diameter are protected and require a permit for removal. CHWD has obtained the permits required for tree removal.

- 1 - 2" DBH and 2- 5" DBH valley oak trees near north fence line.*
- 1 - 22" DBH multi-stem valley oak tree and 1- 14"DBH live oak tree near the center of the yard. The valley oak tree is growing through a fence and the live oak tree has poor structure.*
- 1 - 22" DBH and 1- 16" DBH non-native sycamore trees located in the center of the yard.*
- 1 - 36" DBH redwood tree located near southern fence line.*
- 9 elm trees, range of 6"-16"DBH, along east fence line.*
- 2 - 14" DBH ash trees near the east property line.*
- 2 - 24" DBH fruitless mulberry trees near employee parking.*

The existing project site does not represent suitable habitat for any rare, endangered, or other special status species. Except for the uncontrolled storm water runoff from upslope street drainages, no wetland areas are present on site, and the wetted surface area does not qualify as a wetland. Pre-construction surveys for nesting birds in the project vicinity would be performed if construction occurs during the nesting season between March and August.

CITRUS HEIGHTS WATER DISTRICT
ENVIRONMENTAL INFORMATION FORM

The Project would not adversely affect sensitive species such as federally and/or state listed plants and animals. Habitat such as vernal pools, streams, and other wetlands that could support nearby sensitive species does not exist on site. No fisheries would be adversely affected by Project activities. No fish habitat exists within or near the Project boundaries.

The Project site is enclosed by a fence and surrounded by roads with moderate traffic to the south and west, a storage facility to the north, and a high school to the east. The Project site and these areas are not conducive to wildlife routes. The Project would not adversely affect wildlife migration routes.

13. Geology and Soils: Would the proposed project:

- C a. Result in erosion, changes in topography or unstable soil conditions from excavation, grading or fill?
- D b. Result in changing unique geologic or physical features?
- D c. Involve grading in a waterway or wetland?
- D d. Involve a substantial alteration of ground contours?

Discussion: Ground work would increase erosion potential. Erosion control measures including wattles and silt fences would be in place during construction. The Project site does not contain any wetland or waterway features. Project activities would not alter ground contours substantially. Only minor alteration to direct stormwater runoff would take place.

14. Hazards: Would the proposed project:

- D a. Create a risk of accidental explosion or release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation)?
- D b. Create the use or disposal of potentially hazardous materials (i.e. toxic or flammable substances)?
- D c. Create the creation of any health hazard or potential health hazard?
- D d. Expose people to existing sources of potential health hazards?

Discussion: The Project would not include the permanent or temporary storage of hazardous materials that could pose a potential risk to workers or to the public.

15. Hydrology and Water Quality: Would the proposed project:

- C a. Change water drainage patterns?
- D b. Change the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations or through substantial loss of groundwater recharge capabilities?
- D c. Impact groundwater quality?
- D d. Substantially reduce the amount of groundwater otherwise available for public water supplies?
- D e. Affect area on or adjacent to unique stream or water body?

Discussion: The project site receives drainage from the adjacent parcels. Storm drains located within the project boundary would continue to drain surface and groundwater. Minor relocation of the storm drain from project activities would not affect drainage patterns substantially. There are no unique streams or water bodies in or adjacent to the Project site.

16. Land Use and Planning: Would the proposed project:

- D a. Conflict with the Zoning or General Plan designation?
- C b. Be incompatible with existing land use in the vicinity?
- D c. Disrupt or divide the physical arrangement of an established community?

Discussion: The proposed project would not conflict with existing zoning, land use, or general plan designation from the City of Citrus Heights or from Sacramento County. Access to the

CITRUS HEIGHTS WATER DISTRICT
ENVIRONMENTAL INFORMATION FORM

site would be located on the existing parcel designated as Miscellaneous/Private Road. The other parcels in the project site are designated Public/Utility and Single Family/Residential.

17. **Mineral and Energy Resources:** Would the proposed project:
- D a. Conflict with the conservation of water?
 - D b. Use non-renewable resources in a wasteful and/or inefficient manner?
 - C c. Substantially increase energy consumption (i.e. electricity, oil, natural gas, etc.)?
- Discussion: Construction and operation of the project would increase CHWD equipment and vehicle fuel use, but such amounts would be minor compared to existing fuel use.*
18. **Noise:** Would the proposed project result in:
- C a. An increase to existing noise levels?
 - D b. Exposure of people to severe noise levels?
- Discussion: A sound wall consisting of 8-ft tall concrete panels would be constructed along the southern property line and around the covered material storage area (up to 21-ft high), which will minimize operation noise impacts to the adjacent school. Short-term increases in noise would occur during project construction activities.*
19. **Population and Housing:** Would the proposed project:
- D a. Induce substantial growth in an area either directly or indirectly (i.e. through population growth or infrastructure use)?
 - D b. Displace existing housing, especially affordable housing?
- Discussion: No impact. There would be no change or inducement to housing with the project.*
20. **Public Services:** Would the proposal result in a need for new or altered government services for any of the following public services:
- D a. Fire protection?
 - D b. Police protection?
 - D c. Schools?
 - D d. Maintenance of public facilities, including roads?
 - C e. Other governmental services?
- Discussion: The project would not result in new or altered services for fire protection, police protection, schools, maintenance of public facilities, or other governmental services except for the CHWD project facility itself.*
21. **Recreation:** Would the proposed project:
- D a. Increase the demand for neighborhood or regional parks or other recreational facilities?
 - D b. Affect existing recreational opportunities?
- Discussion: No impacts would result to existing or future recreational facilities or opportunities.*
22. **Transportation and Traffic:** Would the proposed project:
- C a. Increase vehicle trips or traffic congestion?
 - D b. Increase hazards to safety from design features (i.e. sharp curves or dangerous intersections)?
 - D c. Create inadequate access to nearby uses?
 - D d. Reduce on-site parking capacity?
 - D e. Create hazards or barriers for pedestrians or bicyclists?
- Discussion: The proposed project would not significantly increase traffic on local roads or vehicle trips. The additional access to be constructed to the Project site would be located on an existing easement on Schuman Lane, which would not conflict with circulation/level of service for local roads and would not pose an increased safety risk to vehicles or*

CITRUS HEIGHTS WATER DISTRICT
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pedestrians, including students attending the high school. The increase in vehicle trips to and from the project site would occur on Greenback Lane instead of Sylvan Road, thereby reducing truck and other traffic within the local neighborhood. Only small passenger vehicles would continue to enter and exit the Project site from Sylvan Road.

23. Utilities and Service Systems: Would the proposed project result in a need for new systems or supplies, or alterations to the following utilities:

- a. Power or natural gas?
- b. Communications systems?
- c. Local or regional water treatment or distribution facilities?
- d. Sewer or septic tanks?
- e. Storm water drainage?
- f. Solid waste disposal?
- g. Local or regional water supplies?

Discussion: Minor, but not substantial, increases in electricity use would result with the operation of the wash station and other new buildings. Minor increases in the quantity of wastewater to be delivered to the sewer system and regional treatment facility would result with operation of the wash station and expanded pavement area from which storm water would be collected. Minor increases in the volume of solid waste disposal would also be associated with the expanded site operations, including materials separated through the oil/water/sand separator and the excavation dump pits. Minor, but not substantial, increases in demand for on-site water use would result from the wash station and dust control operations of the new facilities.

CERTIFICATION: I hereby certify that the statements furnished above and in the attached plans present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements and information presented are true and correct to the best of my knowledge and belief.

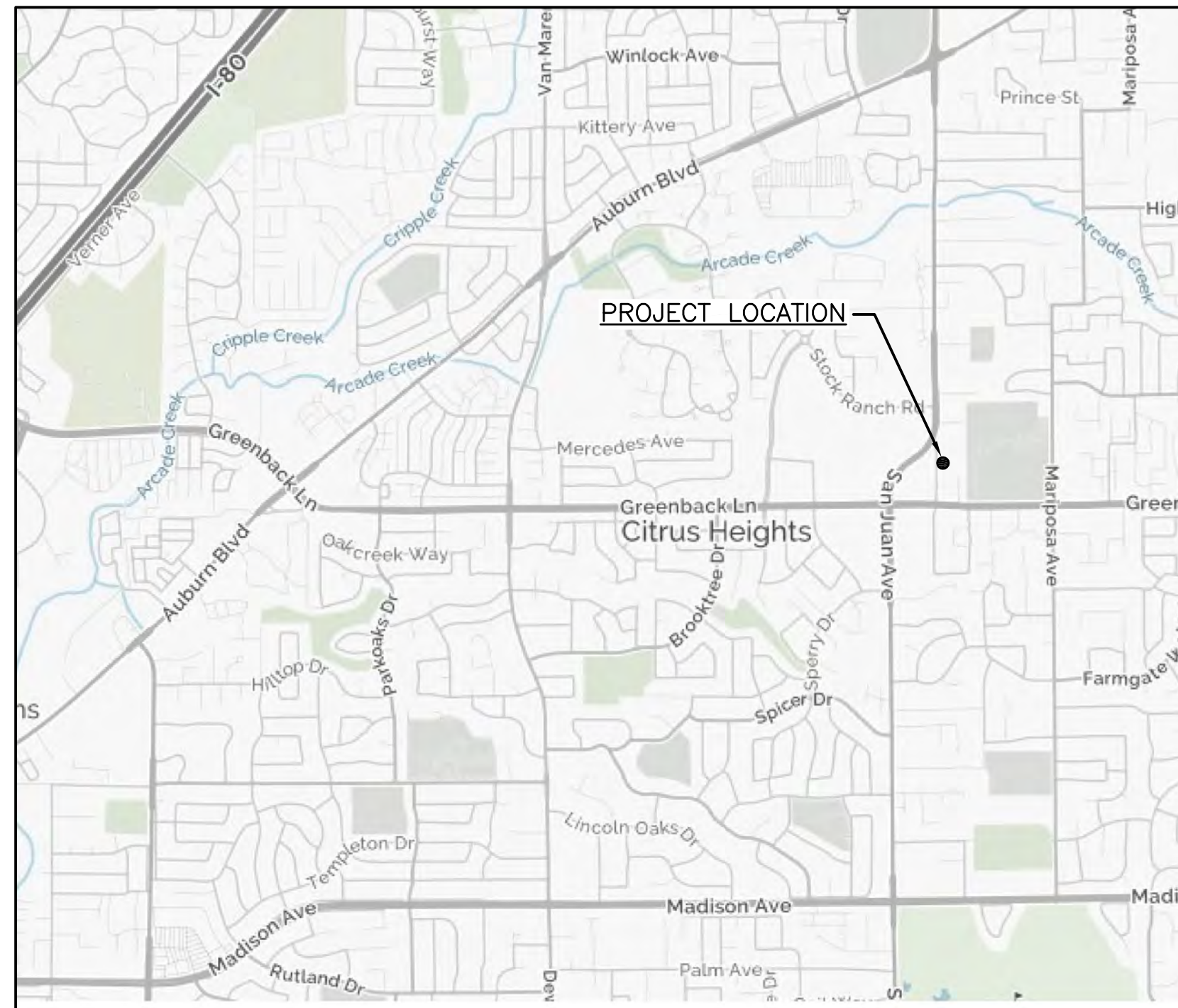
CHWD Review: _____ Date: _____

CITRUS HEIGHTS WATER DISTRICT CORPORATION YARD IMPROVEMENT PROJECT

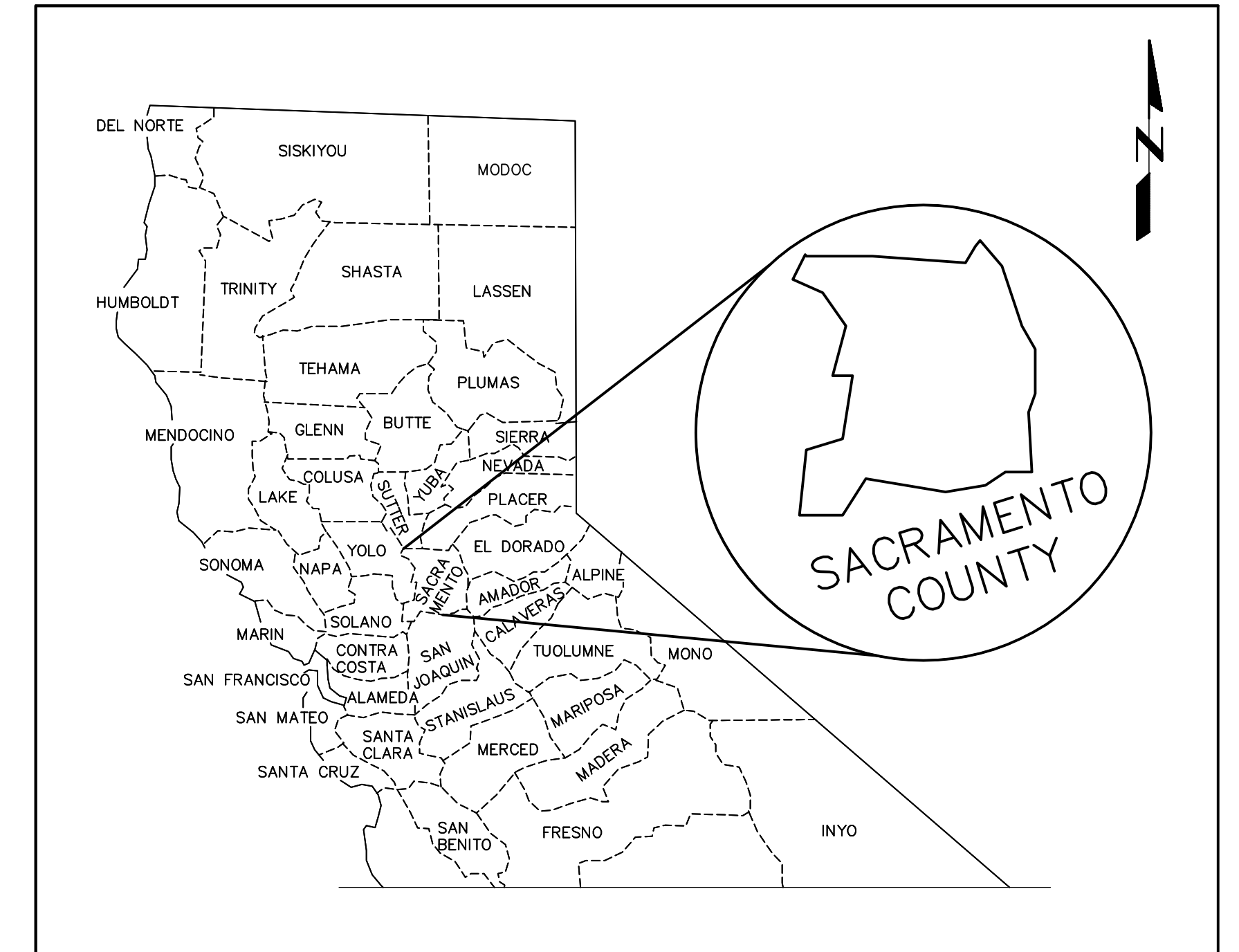
PROJECT NO. C15-102

6230 SYLVAN RD. CITRUS HEIGHTS, CA
APN 24301800460000

MAY, 2017
100% SUBMITTAL



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

INDEX OF DRAWINGS

SHEET NO.	DWG. NO.	TITLE
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2	G2	GENERAL NOTES
3	G3	STRUCTURAL NOTES, SYMBOLS & ABBREVIATIONS
4	C1	EXISTING/DEMOLITION SITE PLAN
5	C2	OVERALL RENOVATION PLAN
6	C3	GRADING, DRAINAGE & PAVING PLAN
7	C4	UNDERGROUND PIPING PLAN
8	C5	FIRE LANE PLAN
9	C6	VECTOR PIT PLAN & SECTIONS
10	C7	MATERIAL STORAGE PLAN
11	C8	MATERIAL STORAGE SECTIONS & DETAILS
12	C9	WASH STATION PLAN & SECTIONS
13	A1	MATERIAL STORAGE - ARCHITECTURAL ELEVATIONS
14	A2	WAS STATION - ARCHITECTURAL ELEVATIONS
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18	T1	TYPICAL DETAILS 1
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20	T3	TYPICAL DETAILS 3
21	T4	TYPICAL DETAILS 4
22	T5	TYPICAL DETAILS 5
23	E1	ELECTRICAL LEGEND
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25	E3	MATERIAL STORAGE ELECTRICAL PLAN & SECTION
26	E4	WASHDOWN STATION ELECTRICAL PLAN & SECTION
27	E5	ELECTRICAL DETAILS I
28	E6	ELECTRICAL DETAILS II

CODE REQUIREMENTS

MINIMUM BASIC WIND SPEED OF 85 MPH
EXPOSURE B: COMMERCIAL BUILDINGS
LIVE LOAD: 20 PSF
SOIL BEARING PRESSURE: 2,000 PSF
CLIMATE ZONE: 12
APPLICABLE CODE STANDARDS
2013 CALIFORNIA BUILDING CODE
2013 CALIFORNIA MECHANICAL CODE
2013 CALIFORNIA PLUMBING CODE
2013 CALIFORNIA ELECTRICAL CODE
2013 CALIFORNIA FIRE CODE
2013 CALIFORNIA GREEN BUILDING STANDARDS CODE

SACRAMENTO AREA SEWER DISTRICT

PLAN CHECKER _____	DATE _____
ORDER NUMBER _____	

SACRAMENTO AREA SEWER DISTRICT

O.K. TO SUBMIT FOR MANHOLE NUMBERING AFTER ALL SEWER CONSTRUCTION IS COMPLETE	
SEWER INSPECTOR _____	DATE _____

APPROVED FOR CONSTRUCTION

MISSY PIERI, P.E.
DISTRICT ENGINEER
CITRUS HEIGHTS WATER DISTRICT

DATE _____

CITY OF CITRUS HEIGHTS

DATE _____

SACRAMENTO METROPOLITAN FIRE DISTRICT PLAN APPROVAL

DATE _____ GREGORY CASSENTINI, AC/FIRE MARSHALL

I:\ASERVER\PROJECTS\PROJECT FILES\CHWD - CORP YARD\DWGS\CHWD001-GS.DWG

DATE	DESCRIPTION

SCALE: NONE	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17
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DOMENICHELLI & ASSOCIATES

1101 Investment Blvd, Suite 115
El Dorado Hills, CA 95762

Ph: (916) 933-1997
Fax: (916) 933-4778

BENCHMARK INFORMATION:
A.P.N. 243-0180-005, 006, 007, 009, 011, 046
BENCHMARK NO. 14-61 ELEV. 163.13
7/8" METAL DISC STAMPED "CO. B.M. 14-61"
LOCATED IN CHISELED SQUARE IN TOP OF
VERTICAL CURB ABOVE D.I. N END OF CURB
RETURN AT THE NORTHWEST CORNER OF
GREENBACK LANE & SYLVAN RD.
VERTICAL DATUM - NAVD 29

6230 Sylvan Rd, Citrus Heights, CA 95610

CORPORATION YARD IMPROVEMENT PROJECT	DRAWING G1
TITLE SHEET & INDEX OF DRAWINGS	SHEET 1 of 28

CITRUS HEIGHTS WATER DISTRICT WATER SYSTEM NOTES:

WS-1. THE CONTRACTOR SHALL POSSESS A STATE OF CALIFORNIA CLASS 'A' GENERAL ENGINEERING CONTRACTOR LICENSE AND SHALL MAINTAIN SAME THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE THE DISTRICT WITH VALID CONTRACTOR'S LICENSE INFORMATION INCLUDING LICENSE NUMBER, NAME OF LICENSE HOLDER, CLASSIFICATION AND EXPIRATION DATE. THE CONTRACTOR SHALL BE SKILLED AND REGULARLY ENGAGED IN CONSTRUCTING PUBLIC WATER DISTRIBUTION SYSTEMS.

WS-2. ALL MATERIALS AND INSTALLATION OF THE WATER DISTRIBUTION SYSTEM SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITRUS HEIGHTS WATER DISTRICT.

WS-3. N/A

WS-4. N/A

WS-5. CITRUS HEIGHTS WATER DISTRICT REQUIRES A CURRENT CERTIFICATE OF COMPLETION FOR TRAINING THAT QUALIFIES INDIVIDUALS TO PERFORM ASBESTOS CONSTRUCTION WORK WITH ASBESTOS CEMENT PIPE (ACP). THE APPROVED TRAINING MUST BE IN AGREEMENT WITH LOCAL, STATE AND FEDERAL REGULATIONS AND CITRUS HEIGHTS WATER DISTRICT'S ASBESTOS CEMENT PIPE SAFETY PLAN. ALL ASBESTOS MATERIALS SHALL BE LESS THAN FOUR FEET (4') LONG, PROPERLY DOUBLE WRAPPED WITH MINIMUM SIX-MIL (6-MIL) PLASTIC, SECURELY TAPED CLOSED WITH A CITRUS HEIGHTS WATER DISTRICT WARNING LABEL AFFIXED BETWEEN PLASTIC LAYERS, AND DELIVERED TO THE CITRUS HEIGHTS WATER DISTRICT FOR PROPER DISPOSAL.

WS-6. THE CONTRACTOR SHALL CONTACT THE CITRUS HEIGHTS WATER DISTRICT FIVE (5) WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION FOR A PRE-CONSTRUCTION CONFERENCE.

WS-7. LOCATION OF WATER FACILITIES SHALL BE ESTABLISHED AND STAKED BY THE CONTRACTOR UTILIZING A LICENSED CIVIL ENGINEER OR LAND SURVEYOR, INCLUDING FINISH GRADE AT FIRE HYDRANTS, MAIN VALVES, TEES, CROSSES, ANGLE POINTS, WATER SERVICES AND RELATED APPURTENANCES.

WS-8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES MAINTAINED IN OR ACROSS A PUBLIC RIGHT-OF-WAY OR COMMON AREA. THE CONTRACTOR SHALL EXPOSE AND VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION OF NEW IMPROVEMENTS CONNECTING TO OR IN THE VICINITY OF SAME.

WS-9. N/A

WS-10. N/A

WS-11. N/A

WS-12. MINIMUM COVER FOR WATER MAINS SHALL BE THIRTY-SIX INCHES (36") INCHES BELOW FINISH GRADE. DUCTILE IRON PIPE (DIP) SHALL BE USED WHEREVER COVER BECOMES LESS THAN THE MINIMUM SUBJECT TO PRIOR APPROVAL.

WS-13. WATER LINES SHALL BE CLASS 350 DIP UNLESS OTHERWISE NOTED. PIPE SHALL BE FREE OF DEFECTS AND DISCOLORATION. FIRE HYDRANT LATERALS SHALL BE CLASS 350 DIP UNLESS OTHERWISE NOTED.

WS-14. ALL WATER MAINS IN THE PIPE ZONE SHALL BE BACKFILLED WITH NO. 2 WASHED SAND COMPACTED TO A RELATIVE COMPACTION OF NOT LESS THAN NINETY PERCENT (90%) TO A MINIMUM OF SIX INCHES (6") BELOW AND TWELVE INCHES (12") ABOVE THE MAIN. BACKFILL SHALL BE DEVOID OF DEBRIS AND CONCRETE, PAVEMENT, STONES, SOLID EARTH CHUNKS AND PARTICULATE LARGER THAN THREE INCHES (3") IN GREATEST DIMENSION. WITHIN EXISTING ROADWAYS AND EXISTING TRAFFIC AREAS, THE REMAINING TRENCH BACKFILL ABOVE THE SAND SHALL ALL BE THREE-QUARTER INCH (3/4") CLASS 2 AGGREGATE BASE COMPACTED TO CITY/COUNTY ROADWAY REQUIREMENTS.

WS-15. THE METHODS FOR OBTAINING COMPACTION SHALL BE AS SPECIFIED BY THE MOST CURRENT EDITIONS OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK") AND THE COUNTY OF SACRAMENTO PUBLIC WORKS STANDARD CONSTRUCTION SPECIFICATIONS. NUCLEAR DENSITY METER TESTING BY A LICENSED GEOTECHNICAL ENGINEER IN ACCORDANCE WITH ASTM STANDARD TEST METHODS FOR LABORATORY COMPACTION SHALL BE REQUIRED OF THE CONTRACTOR FOR IN-PLACE SOIL AND THREE-QUARTER-INCH (3/4") CLASS 2 AGGREGATE BASE.

WS-16. A NO. 10 INSULATED COPPER LOCATOR WIRE SHALL BE AFFIXED TO WATER MAINS, FIRE HYDRANTS, MAIN AND HYDRANT VALVES, WATER SERVICES, AND APPURTENANCES, INCLUDING ALL PIPING BEYOND THE METER TO THE VARIOUS 2" HYDRANT RISERS. THE WIRE SHALL BE AFFIXED TO THE TOP OF PIPE WITH TEN-MIL (10-MIL) VINYL TAPE EVERY FIVE FEET (5'). THE CONTRACTOR SHALL CONDUCT A CONTINUITY TEST ON ALL LOCATOR WIRE SPLICES. A MINIMUM OF TWO (2) STRANDS OF THREE INCH (3") WIDE NON-DETECTABLE BLUE TAPE MARKED "WATER" SHALL BE PLACED TWELVE INCHES (12") ABOVE MAIN AND SERVICE PIPING AT THE TRENCH EDGES.

WS-17. ALL AWWA KEY-OPERATED VALVES TWELVE INCH (12") AND SMALLER SHALL BE EPOXY-COATED RESILIENT WEDGE GATE VALVES (RWGV) UNLESS OTHERWISE SPECIFIED. VALVES FOURTEEN INCH (14") AND LARGER SHALL BE EPOXY-COATED BUTTERFLY VALVES (BFV) UNLESS OTHERWISE SPECIFIED. MAIN AND HYDRANT VALVES SHALL BE FLANGED TO FITTINGS UNLESS OTHERWISE NOTED.

WS-18. N/A

WS-19. ALL MAIN VALVES AND FIRE HYDRANT VALVES SHALL BE PROVIDED WITH AN OLDCASTLE PRECAST NO. G04 TRAFFIC VALVE BOX AND NO. G04C CAST IRON LID MARKED "WATER." THE TRIANGULAR LID SHALL POINT IN THE DIRECTION OF THE WATER MAIN THAT IS ISOLATED BY THE VALVE. THE VALVE OPERATING NUT SHALL BE FULLY ACCESSIBLE AND CENTERED IN THE VALVE ACCESS RISER. MAIN VALVES, SERVICE VALVES, AND BLOW-OFF VALVE BOXES SHALL AVOID CONFLICTS WITH CURBS, GUTTERS, SIDEWALKS AND DRIVEWAYS UNLESS APPROVED BY THE DISTRICT, AND BE VISIBLE AND ACCESSIBLE AFTER YARD GRADING/LANDSCAPING IS COMPLETED BY THE CONTRACTOR/DEVELOPER.

SASD SANITARY SEWER NOTES

REVISED 10/31/2014

1. ALL CONSTRUCTION AND MATERIALS USED WITHIN THE PIPE ZONE SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE SASD DESIGN STANDARDS AND SPECIFICATIONS. THE LATEST EDITION SHALL TAKE PRECEDENCE. THE CONTRACTOR SHALL OBTAIN AND USE ALL APPLICABLE ADDENDUMS. INTERMEDIATE BACKFILL, FINAL BACKFILL, AND ALL ROAD SECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE GOVERNING JURISDICTION STANDARD CONSTRUCTION SPECIFICATIONS.

2. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE INSPECTION OFFICE FIVE (5) WORKING DAYS IN ADVANCE OF BEGINNING WORK:

- 2.1. FOR COLLECTOR FACILITIES
 - 2.1.1. FOR PROJECTS LOCATED WITHIN THE UNINCORPORATED COUNTY, CITY OF CITRUS HEIGHTS, CITY OF RANCHO CORDOVA AND THE CITY OF ELK GROVE CONTACT THE SACRAMENTO COUNTY CONSTRUCTION MANAGEMENT AND INSPECTION DIVISION AT 875-2700.
 - 2.1.2. FOR PROJECTS LOCATED WITHIN THE CITY OF SACRAMENTO LIMITS CONTACT THE PUBLIC UTILITIES DEPARTMENT AT 808-6810.
- 2.2. FOR TRUNK FACILITIES
 - 2.2.1. CONTACT THE SACRAMENTO COUNTY CONSTRUCTION MANAGEMENT AND INSPECTION DIVISION AT 875-2700.

3. PLANS SHALL BE RESUBMITTED FOR APPROVAL IF CONSTRUCTION OF SEWER FACILITIES HAS NOT BEGUN WITHIN ONE YEAR AFTER THE FINAL APPROVAL DATE OF THESE IMPROVEMENT PLANS.

4. ALL WORK SHALL BE INSPECTED BY THE SASD INSPECTION STAFF PRIOR TO BACKFILLING THE PIPE ZONE.

5. DIMENSIONS SHOWN ON PLANS ARE TO THE CENTERLINE OF PIPE AND OR MANHOLES, UNLESS OTHERWISE NOTED.

6. ALL MANHOLES SHALL BE 48" IN DIAMETER, UNLESS OTHERWISE SHOWN.

7. SANITARY SEWER MAINS SHALL BE CONSTRUCTED OF EXTRA STRENGTH VCP PIPE WITH TYPE II BEDDING AND BACKFILL, UNLESS OTHERWISE NOTED.

8. CONTRACTOR SHALL USE SIX-FOOT (6') PIPE LENGTHS IN CURVED SECTIONS, UNLESS OTHERWISE NOTED.

9. COMMERCIAL AND RESIDENTIAL LOWER LATERALS SHALL BE CONSTRUCTED PER SASD DESIGN STANDARDS DRAWING LL-01A.

10. CONSTRUCTION OF A CLEANOUT TO GRADE FOR ALL LOWER LATERALS IS REQUIRED PER SASD DESIGN STANDARD DRAWING LL-02A.

11. ANY WATER ENTERING THE SANITARY SEWER SYSTEM TO BE CONSTRUCTED UNDER THESE PLANS SHALL NOT BE DISCHARGED TO THE EXISTING SYSTEM. PLUGS MUST BE INSTALLED IN EXISTING MANHOLES AS NECESSARY TO PERMIT PUMPING THE NEW SYSTEM CLEAR OF WATER AND DEBRIS PRIOR TO ACCEPTANCE. CARE SHALL BE EXERCISED IN LOCATING PLUGS TO AVOID INTERRUPTING SERVICE CONNECTIONS. MORTAR AND BRICKS OR MECHANICAL DEVICE PLUGS MUST BE USED; INFLATABLE DEVICES ARE NOT SATISFACTORY.

12. SASD REQUIRES TELEVISION INSPECTION OF ALL CONSTRUCTED SEWER LINES IN ACCORDANCE WITH SECTION 333 OF THE SASD STANDARDS AND SPECIFICATIONS. THE SEWER INSPECTOR SHALL SIGN PLANS ON PROVIDED SIGNATURE BLOCK "OK TO SUBMIT FOR GRID NUMBERING" AFTER INSTALLATION OF ALL SEWER FACILITIES AND PRIOR TO OBTAINING DISTRICT GRID NUMBERS FOR TELEVISION INSPECTION.

13. FOR THE CURRENT LIST OF SASD APPROVED TV CONTRACTORS GO TO [HTTP://WWW.SACSEWER.COM/PDF/APRV-TV-CON.PDF](http://www.sacsewer.com/pdf/APRV-TV-CON.PDF) OR CALL 916-876-PLAN (7526)

14. DEWATERING SHALL BE PERFORMED AS NECESSARY TO PROVIDE A STABLE TRENCH BOTTOM FOR PLACEMENT OF SEWER FACILITIES. PRIOR TO THE CONTRACTOR PLACING MATERIALS IN THE TRENCH, THE BOTTOM OF THE TRENCH SHALL BE CERTIFIED BY A GEOTECHNICAL ENGINEER VERIFYING THAT THE TRENCH MEETS THE REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT. ADDITIONAL REQUIREMENTS FOR UNSTABLE CONDITIONS SHALL BE AT THE WRITTEN DIRECTION OF THE PROJECT GEOTECHNICAL ENGINEER OF RECORD. GEOTEXTILE FABRIC WILL BE REQUIRED AS DESCRIBED IN NOTE 2: SASD DESIGN STANDARD DRAWING P-01.

15. ANY DEVIATIONS FROM THE APPROVED PLANS SHALL BE SUBMITTED TO SASD FOR APPROVAL. ALL DEVIATIONS SHALL BE APPROVED IN WRITING BY SASD AS A PLAN REVISION PRIOR TO CONSTRUCTION. THE REQUEST FOR DEVIATION FORM CAN BE FOUND AT [HTTP://WWW.SACSEWER.COM/PDF/FOR-REQUEST-FOR-DEVIATION.PDF](http://www.sacsewer.com/pdf/FOR-REQUEST-FOR-DEVIATION.PDF)

I:\ASER\PROJECTS\PROJECT FILES\CHWD - CORP YARD\DWGS\CHWD001-GS.DWG

SCALE:				DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17						BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29				CORPORATION YARD IMPROVEMENT PROJECT		DRAWING G2	
NONE		IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.				1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762		Ph: (916) 933-1997 Fax: (916) 933-4778				GENERAL NOTES		SHEET 2 of 28			
DATE	DESCRIPTION																

STRUCTURAL NOTES:

SEE PROJECT SPECIFICATIONS FOR FURTHER REQUIREMENTS.

DESIGN CRITERIA:

- BUILDING CODE: 2016 CALIFORNIA BUILDING CODE
- WIND LOADS:
 - BASIC WIND SPEED, V=100 MPH
 - EXPOSURE CATEGORY = B
- SEISMIC LOADS:
 - IMPORTANCE FACTOR = 1.0
 - RISK CATEGORY - I
 - GROUP = U, UTILITY
 - SS = 0.52
 - S1 = 0.255
 - SITE CLASS D
 - SDS = 0.480
 - SM1 = 0.321
 - SEISMIC DESIGN CATEGORY = D
- VERTICAL LOADS:
 - ROOF DEAD LOAD = PER BUILDING DESIGNER
 - ROOF LIVE LOAD = 20 PSF
 - SNOW LOADS = 0 PSF

GENERAL NOTES:

- ALL CONSTRUCTION SHALL CONFORM TO THE 2016 EDITION OF THE CALIFORNIA BUILDING CODE AND ALL OTHER APPLICABLE CODES AND REGULATIONS.
- DETAILS AND NOTES SHOWN ON THIS SHEET ARE TYPICAL AND SHALL APPLY UNLESS OTHERWISE SHOWN OR NOTED. DETAILS OF CONSTRUCTION NOT FULLY SHOWN SHALL BE OF THE SAME NATURE SHOWN FOR SIMILAR CONDITIONS.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS, ELEVATIONS, EXISTING CONDITIONS AND OTHER RELATED ITEMS. THE CONTRACTOR SHALL REVIEW THE CONTRACT DOCUMENTS PRIOR TO CONSTRUCTION AND SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE FOUND. IF CONFLICTS ARE FOUND THE MOST STRINGENT CONDITION SHALL GOVERN.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH THE PERTINENT SECTIONS, AS THEY APPLY TO THIS PROJECT OF THE "CONSTRUCTION SAFETY ORDERS" ISSUED BY THE STATE OF CALIFORNIA AND ALL THE OSHA REQUIREMENTS. THE ARCHITECT, THE ENGINEER AND THE OWNER DO NOT ACCEPT ANY RESPONSIBILITY FOR THE CONTRACTOR'S FAILURE TO COMPLY WITH THESE REQUIREMENTS.
- IT IS THE CONTRACTOR'S RESPONSIBILITY FOR ADEQUATE DESIGN AND CONSTRUCTION OF ALL FORMS, BRACING AND SHORING REQUIRED. THE CONTRACTOR SHALL PROVIDE ADEQUATE STAYS AND BRACING OF ALL FRAMING UNTIL ALL ELEMENTS OF DESIGN HAVE BEEN INCORPORATED IN THE PROJECT.

FOUNDATION NOTES:

- FOUNDATIONS ARE DESIGNED BASED ON SOILS REPORT BY: PARAGON GEOTECHNICAL, INC., JANUARY 2017. ALL SITE PREPARATION SHALL BE IN ACCORDANCE WITH SOILS REPORT UNLESS NOTED OTHERWISE IN CONTRACT DOCUMENTS.
- ALLOWABLE BEARING PRESSURE OF 2000 PSF, FOR DEAD AND LIVE LOADS AND 2600 PSF TOTAL LOAD (INCLUDING WIND AND SEISMIC)
- FOOTINGS SHALL BEAR ON FIRM, DRY, UNDISTURBED SOIL AS CLASSIFIED IN NOTE #2 ABOVE. DEPTHS INDICATED ON THE PLANS SHALL BE THE MINIMUM DEPTH OF FOOTING. THE CONTRACTOR SHALL NOTIFY THE ENGINEER WHEN CONDITIONS ON THE JOB SITE DIFFER FROM THOSE INDICATED IN THE CONTRACT DOCUMENTS.
- ALL FOOTINGS NOT FORMED SHALL BE POURED INTO NEAT EXCAVATIONS AND THE FOOTING WIDTH SHALL BE INCREASED BY 2 INCHES. PRECAUTIONS SHALL BE TAKEN TO PREVENT SLOUGHING OF SOIL INTO THE FOOTING EXCAVATION PRIOR TO AND DURING THE PLACING OF CONCRETE.

CONCRETE NOTES:

- ALL CONCRETE SHALL MEET THE FOLLOWING MINIMUM SPECIFICATIONS:
 - DESIGN STRENGTH AT 28 DAYS 3,000 PSI.
 - MAXIMUM SLUMP SHALL BE 4 INCHES.
 - AGGREGATE SIZE SHALL BE COMPATIBLE WITH POURING, PLACING AND FINISHING CONDITIONS. W/C RATIO NOT TO EXCEED 0.45.
- ALL CONCRETE SHALL CONFORM TO REQUIREMENTS OF THE

CURRENT EDITION OF THE ACI CODE.

- CEMENT SHALL CONFORM TO ASTM C-150, TYPE 1 OR 2.
- CONCRETE AGGREGATES SHALL CONFORM TO ASTM C-33.
- REMOVE ALL DEBRIS FROM THE FORMS BEFORE POURING ANY CONCRETE. NO WOOD FORM SPREADERS OR WOOD STAKES SHALL BE USED IN AREAS TO BE CONCRETED.
- REINFORCING DOWELS, BOLTS, ANCHORS AND ON OTHER ITEMS TO BE EMBEDDED IN CONCRETE SHALL BE SECURELY POSITIONED BEFORE PLACING CONCRETE.
- MAXIMUM FREE FALL OF CONCRETE SHALL NOT EXCEED 5 FEET IN HEIGHT.
- CONSOLIDATE CONCRETE BY MECHANICAL VIBRATION SUPPLEMENTED BY HAND RODDING OR TAMPING. USE EQUIPMENT AND PROCEDURES FOR CONSOLIDATION OF CONCRETE IN ACCORDANCE WITH THE RECOMMENDATIONS OF ACI 309 TO SUIT THE TYPE OF CONCRETE AND PROJECT CONDITIONS.
- CONSTRUCTION JOINTS SHALL BE ROUGH AND ALL LAITANCE REMOVED FROM THE SURFACE. CONCRETE MAY BE ROUGHENED BY CHIPPING THE ENTIRE SURFACE, SAND BLASTING OR HOSING THE SURFACE AFTER THE POUR WITH A FINE WATER SPRAY. OBTAIN STRUCTURAL ENGINEER'S APPROVAL FOR ANY CJ'S NOT DETAILED ON PLANS.
- WALLS SHALL BE POURED IN HORIZONTAL LAYERS OF 2 FEET MAXIMUM.
- CONCRETE IN WALLS, PIERS OR COLUMNS SHALL SET AT LEAST 2 HOURS BEFORE PLACING CONCRETE BEAMS, SPANDRELS OR SLABS SUPPORTED THEREON.
- ALL FORMWORK SHALL REMAIN IN PLACE FOR THE PERIODS OF TIME SPECIFIED IN THE ACI CODE AS A MINIMUM.
- ALL CONCRETE SHALL BE CURED BY AN APPROVED METHOD.
- FOLLOW THE ACI RECOMMENDATIONS FOR PLACING AND CURING CONCRETE DURING HOT OR COLD WEATHER CONDITIONS.
- UNLESS NOTED OTHERWISE ON PLANS THE CONTRACTOR SHALL PROVIDE SLAB JOINTS AT A MAXIMUM SPACING OF 25' IN EACH DIRECTION.

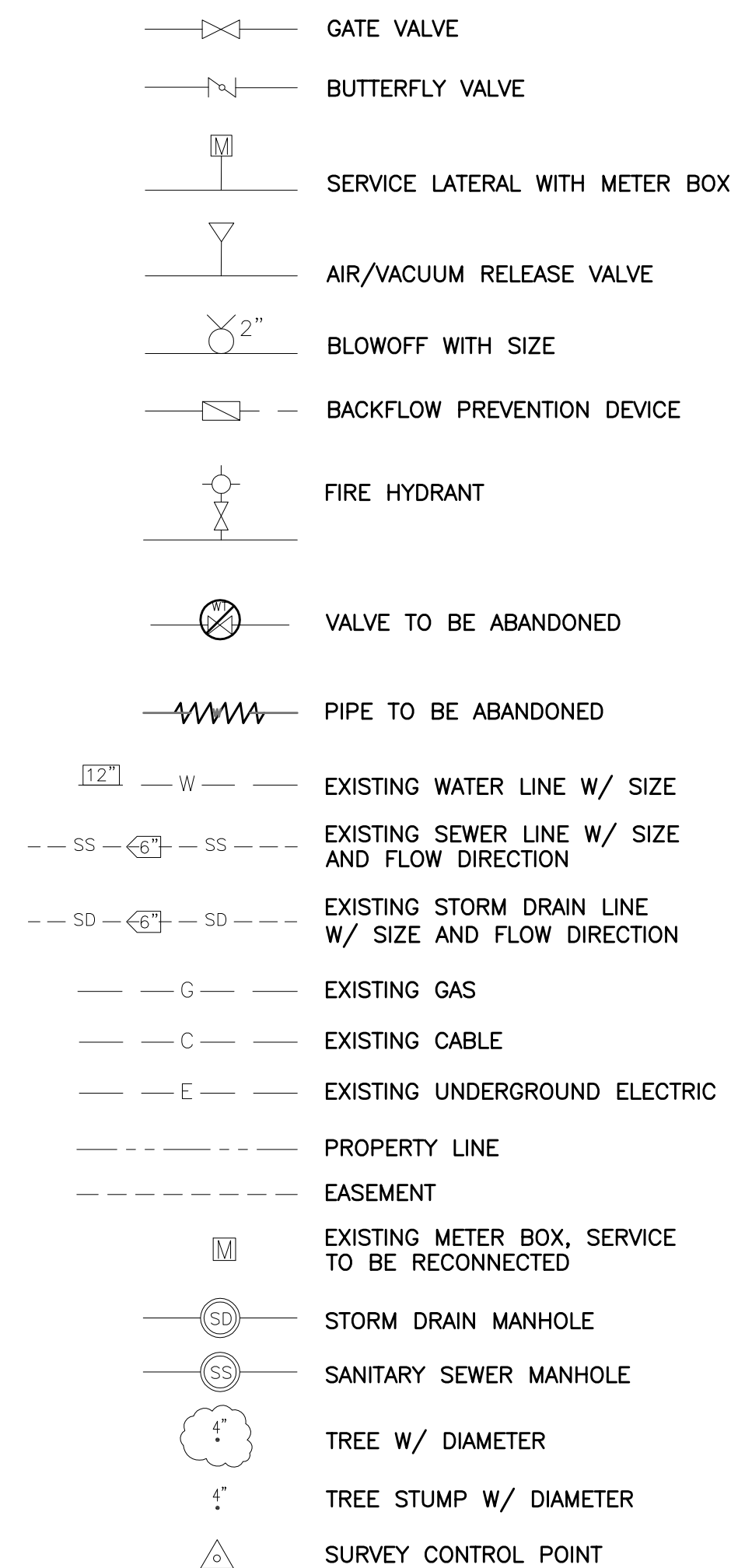
MASONRY NOTES:

- ALL MASONRY WORK SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT EDITION OF THE CALIFORNIA BUILDING CODE, ACI 530 AND ACI 530.1.
- HANDLE MASONRY UNITS TO PREVENT SOILING, CHIPPING, OR DAMAGE OF ANY KIND.
- COLD WEATHER CONDITIONS: IMPLEMENT COLD WEATHER PROCEDURES PER ACI 530.1, 1.8, C.
- HOT WEATHER CONDITIONS: IMPLEMENT HOT WEATHER PROCEDURES PER ACI 530.1, 1.8, D.
- HOLLOW LOAD-BEARING UNITS:
 - ASTM, GRADE N, LIGHTWEIGHT.
 - SPLIT FACE.
 - NOMINAL FACE DIMENSIONS: 8 INCHES BY 16 INCHES.
 - COLOR: PER DISTRICT REPRESENTATIVE.
- MORTAR AND GROUT:
 - MORTAR: ASTM C270 M.
 - MAXIMUM AIR CONTENT: 12 PERCENT.
 - AVERAGE COMPRESSIVE STRENGTH: 2,500 PSI AT 28 DAYS.
 - GROUT: MINIMUM COMPRESSIVE STRENGTH: 2,000 PSI AT 28 DAYS.

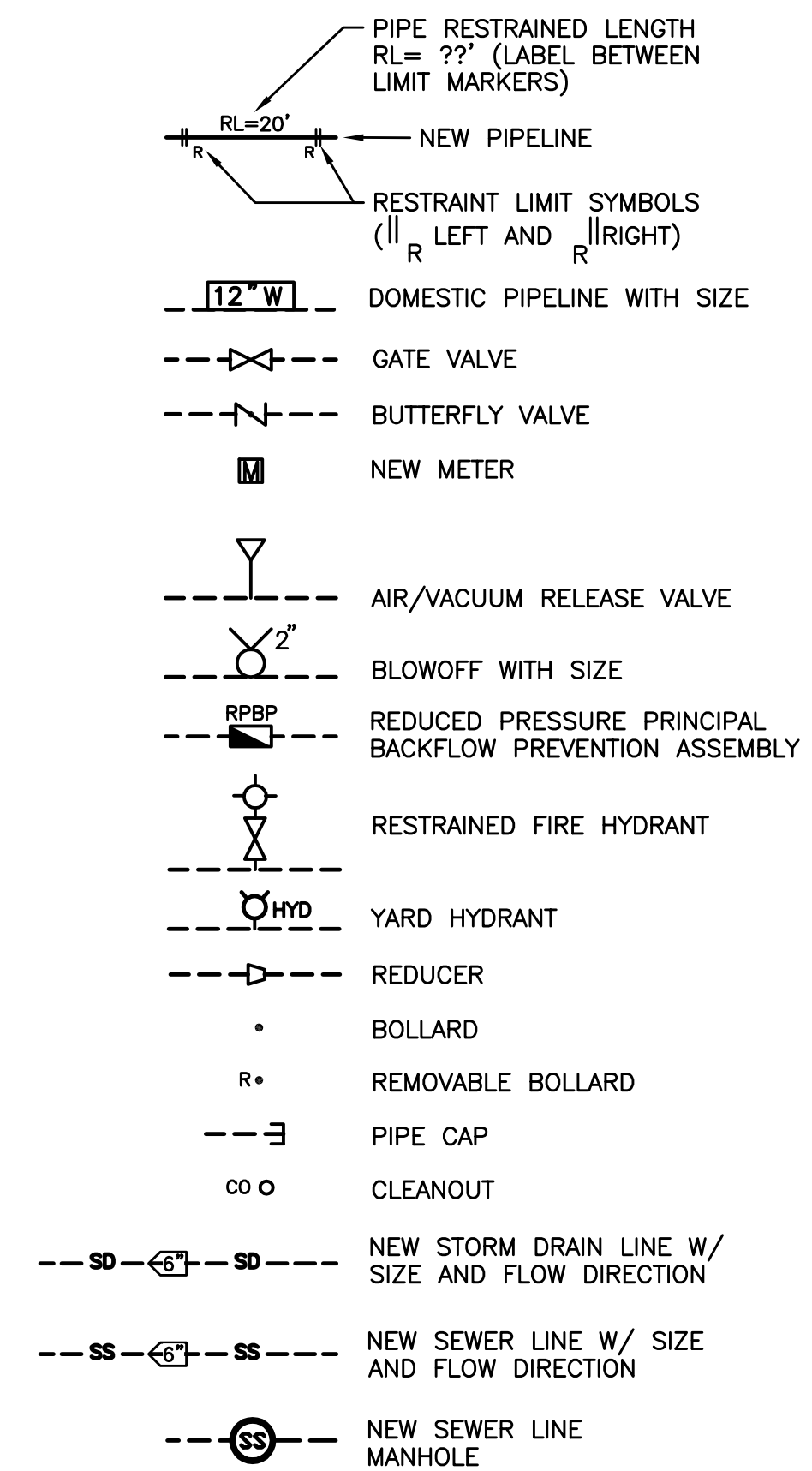
ANCHOR NOTES:

- ASTM A307: CARBON STEEL EXTERNALLY THREADED.
- 3/4-INCH MINIMUM, EXCEPT AS INDICATED.
- CONTRACTOR'S OPTION:
 - IF CAST-IN ANCHOR BOLTS ARE SHOWN, THEN CAST-IN ANCHOR BOLTS SHALL BE USED.
 - IF EPOXY-SET ANCHORS ARE SHOWN, THEN EPOXY-SET ANCHORS OR CAST IN ANCHORS MAY BE USED.
 - IF EXPANSION ANCHORS ARE SHOWN, THE CONTRACTOR MAY USE CAST-IN ANCHOR BOLTS, EPOXY-SET ANCHORS OR EXPANSION ANCHORS.
- IF BOLT MATERIALS ARE NOT NOTED ON PLANS, THE MATERIALS SHALL BE:
 - SUBMERGED: 316 STAINLESS STEEL
 - ENCASED IN CONCRETE: CARBON STEEL
 - EXPOSED OUTDOORS: GALVANIZED

EXISTING



PROPOSED



ABBREVIATIONS

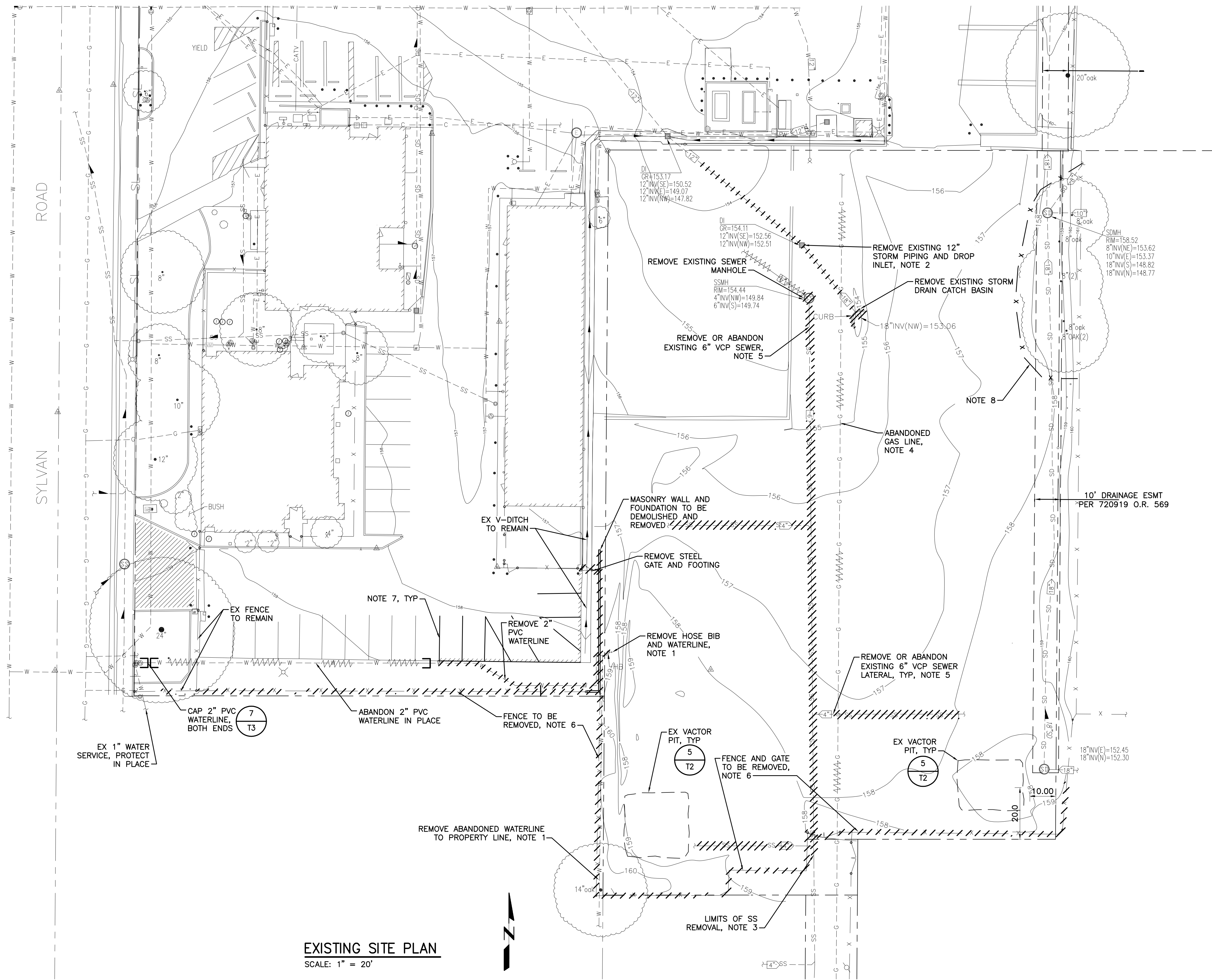
AB	AGGREGATE BASE
ABAN	ABANDON
AC	ASPHALT CONCRETE
APPROX	APPROXIMATE
ARV	AIR RELEASE VALVE
AVRV	AIR VACUUM RELEASE VALVE
BFV	BUTTERFLY VALVE
BFP	BACKFLOW PREVENTER
BOV	BLOWOFF VALVE
BV	BALL VALVE
BW	BACK OF WALK
C&G	CURB AND GUTTER
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CL	CENTERLINE / CLASS
CMP	CORRUGATED METAL PIPE
CONC	CONCENTRIC
CPL	COUPLING
DI	DRAIN INLET
DS	DOWNSPOUT
DT	DITCH (CENTER "V")
DIP	DUCTILE IRON PIPE
EF	EACH FACE
EL	ELEVATION
EOP	EDGE OF PAVEMENT
ESMT	EASEMENT
EW	EYEWASH OR EACH WAY
EXT	EXTERIOR
(E)/EX	EXISTING
FF	FINISH FLOOR
FG	FINISH GRADE
FL	FLOWLINE
FH	FIRE HYDRANT
FOC	FACE OF CURB
GALV	GALVANIZED
GB	GRADE BREAK
GV	GATE VALVE
HB	HOSE BIB
HP	HIGH POINT
HR	HOSE RACK
HYD	HYDRANT
IE	INVERT ELEVATION
INV	INVERT
L	LENGTH
MANF	MANUFACTURER
MAX	MAXIMUM
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
P	PAD ELEVATION
PL	PROPERTY LINE
PP	POWER POLE
PRV	PRESSURE RELIEF VALVE
PVMT	PAVEMENT
PVC	POLYVINYL CHLORIDE PIPE
PVT	PRIVATE
R	RADIUS
REINF	REINFORCEMENT
REPL	REPLACE
RIM	RIM ELEVATION
ROW	RIGHT OF WAY
RPBP	REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY
RS	RESILIENT SEATED
S/O	SAND OIL SEPARATOR
SASD	SACRAMENTO AREA SEWER DISTRICT
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
STL	STEEL
TC	TOP OF CURB
TOC	TOP OF CONCRETE
TYP	TYPICAL
T&B	TOP AND BOTTOM
UE	UNDERGROUND ELECTRICAL
UG	UNDERGROUND GAS
UT	UNDERGROUND TELEPHONE
VCP	VITREOUS CLAY PIPE
W	WATER MAIN
W/-	WITH
WM	WATER METER
WS	WATER SERVICE

NOTE - REFERENCE SHEET E1 FOR ELECTRICAL SYMBOLS AND ABBREVIATIONS

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	SCALE: NONE	<p>IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.</p>	DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17	<p>1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762 Ph: (916) 933-1997 Fax: (916) 933-4778</p>		BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29	<p>6230 Sylvan Rd, Citrus Heights, CA 95610</p>	CORPORATION YARD IMPROVEMENT PROJECT STRUCTURAL NOTES, SYMBOLS AND ABBREVIATIONS	DRAWING G3 SHEET 3 of 28	
DATE	DESCRIPTION									

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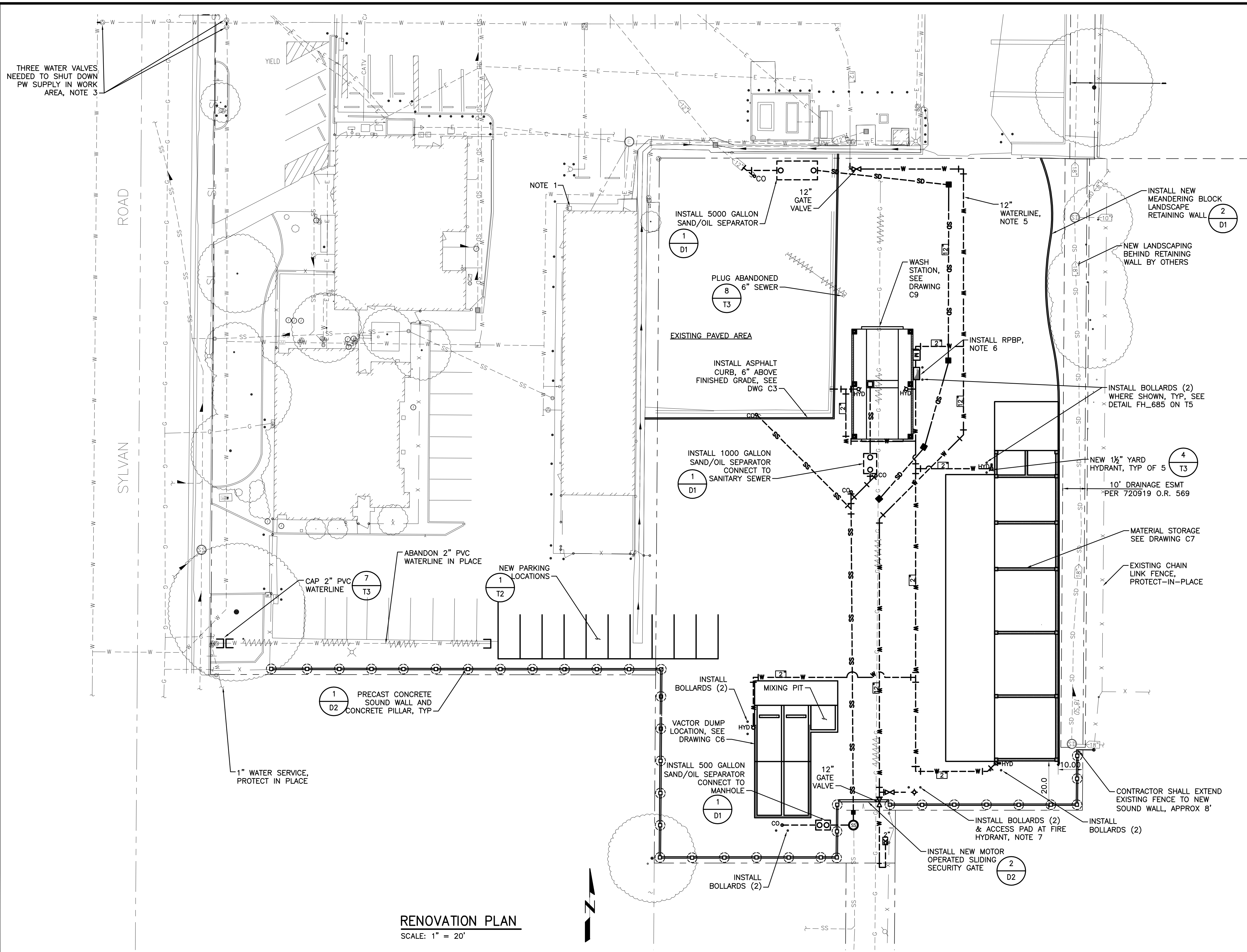


EXISTING SITE PLAN
SCALE: 1" = 20'

- NOTES:**
1. REMOVE EXISTING WATERLINE AND HOSE BIB TO A POINT OUTSIDE OF NEW WALL FOOTING, APPROXIMATELY 60 FEET.
 2. REMOVE EXISTING 12-INCH STORM DRAIN PIPING TO THE TIE-IN POINT OF THE NEW STORM DRAIN FROM THE NEW SAND/OIL SEPARATOR, APPROXIMATELY 85- FEET.
 3. REFER TO DRAWING C4 FOR FINAL SEWER LINE CONNECTION.
 4. ABANDONED GAS LINE DISCONNECTED AT MAIN PER PG&E. CONTRACTOR TO VERIFY. REMOVE AS REQUIRED.
 5. EXISTING SEWER PIPE AND LATERALS ARE VITREOUS CLAY PIPE. CONTRACTOR TO VERIFY. CONTRACTOR SHALL EITHER REMOVE PIPE OR BREAK-UP PIPE AND BURY. CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE EXISTING SEWER PIPELINE DOES NOT INTERFERE WITH THE NEW FACILITIES AND IT IS PROPERLY DISPOSED OF.
 6. CONTRACTOR SHALL PROVIDE TEMPORARY SECURITY FENCING AT ALL TIMES WHEN THE EXISTING FENCE IS MOVED.
 7. REMOVE EXISTING STRIPING WHERE NEW STALLS ARE TO BE MARKED, SEE DRAWINGS C2 AND C3.
 8. PROTECT AREA WITH ORANGE FENCING. SET FENCING AT A MINIMUM OF 1'-0" BEYOND THE TREE DRIP LINE.

DATE		DESCRIPTION		SCALE: AS NOTED	<p>WARNING 0 1/2 1</p> <p>IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.</p>	<p>DESIGNED DARYL W. HEIGHER</p> <p>DRAWN JIM CADE</p> <p>CHECKED SARA ROGERS</p> <p>DATE 05/03/17</p>	<p>DOMENICHELLI & ASSOCIATES</p> <p>1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762</p> <p>Ph: (916) 933-1997 Fax: (916) 933-4778</p>	<p>REGISTERED PROFESSIONAL ENGINEER CIVIL STATE OF CALIFORNIA</p> <p>NO. 064226 Exp. 6/30/17</p>	<p>BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. IN END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29</p>	<p>CITRUS HEIGHTS WATER DISTRICT</p> <p>6230 Sylvan Rd, Citrus Heights, CA 95610</p>	<p>CORPORATION YARD IMPROVEMENT PROJECT</p> <p>EXISTING SITE/DEMOLITION PLAN</p>	<p>DRAWING C1</p> <p>SHEET 4 of 28</p>
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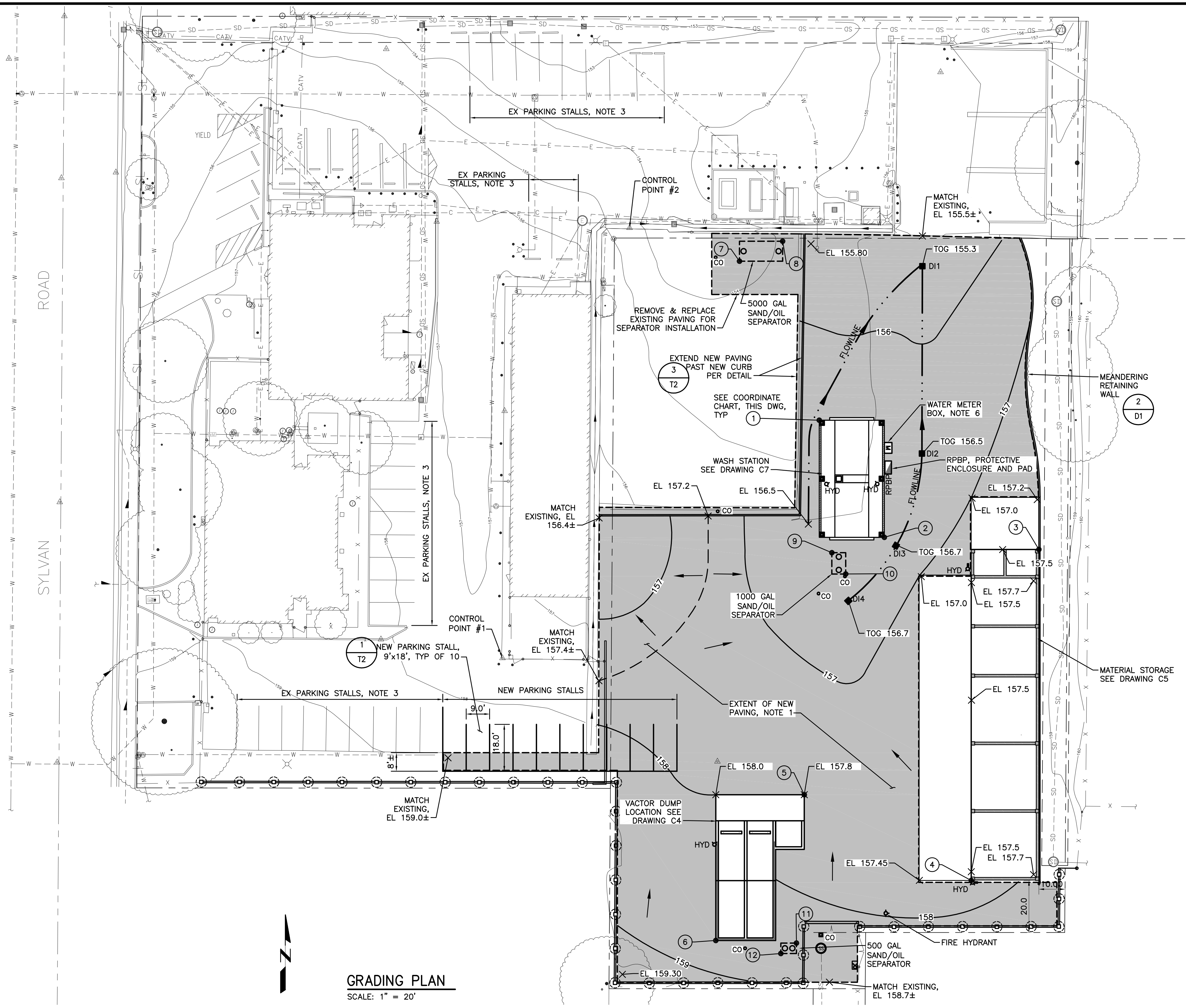


- NOTES:**
- IF THE EXISTING EYEWASH IS DISCONNECTED OR TEMPORARILY OUT OF SERVICE FOR ANY REASON, PROVIDE A TEMPORARY SELF CONTAINED EYEWASH AND INSTALL NEAR THE EXISTING LOCATION.
 - CONTRACTOR SHALL PROVIDE TEMPORARY SECURITY FENCING AT ALL TIMES WHEN THE EXISTING FENCE IS MOVED.
 - CONTRACTOR SHALL COORDINATE WITH THE DISTRICT A MINIMUM OF TWO WEEKS PRIOR TO NEEDING ANY WATER SUPPLY TEMPORARILY SHUT OFF.
 - CONTRACTOR SHALL RE-STRIPE EXISTING PAVING MATCHING EXISTING PATTERN. SEE DRAWING C3.
 - DISTRICT CREWS WILL INSTALL 12-INCH DIP WATERLINE, FIRE HYDRANT, BLOWOFF AND 2-INCH WATER SERVICE UP TO AND INCLUDING THE METER AND REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY (RPBP). THE CONTRACTOR SHALL INSTALL ALL OTHER WATER SYSTEM PIPING BEYOND RPBP INCLUDING 1 1/2-INCH YARD HYDRANTS. SEE DRAWING C4.
 - DISTRICT SHALL INSTALL THE NEW REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY PER CHWD STANDARD DETAIL RP_312 AS SHOWN ON DRAWING T5. CONTRACTOR SHALL INSTALL CONCRETE PAD AND PROTECTIVE ENCLOSURE PER CHWD STANDARD DETAIL RP_312.
 - DISTRICT WILL INSTALL FIRE HYDRANT ASSEMBLY. CONTRACTOR SHALL INSTALL FIRE HYDRANT ACCESS PAD AND PROTECTION BOLLARDS. SEE DETAILS FH_684 AND FH_685 ON DRAWING T5.

RENOVATION PLAN
SCALE: 1" = 20'

DATE	DESCRIPTION	SCALE:	WARNING	DESIGNED DARYL W. HEIGHER	DOMENICHELLI & ASSOCIATES 1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762 Ph: (916) 933-1997 Fax: (916) 933-4778	BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29	 CITRUS HEIGHTS WATER DISTRICT 6230 Sylvan Rd, Citrus Heights, CA 95610	CORPORATION YARD IMPROVEMENT PROJECT	DRAWING C2
		AS NOTED	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	CHECKED SARA ROGERS				DATE 05/03/17	OVERALL RENOVATION PLAN

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- NOTES:**
1. SHADED AREA REPRESENTS THE EXTENT OF NEW PAVING. APPROXIMATE PAVING AREA: 33,800 FT².
 2. BOLLARDS NOT SHOWN FOR CLARITY. SEE DRAWING C2.
 3. CONTRACTOR SHALL REPAINT EXISTING PARKING STALL MARKINGS AS NOTED.
 4. ALL BOLLARDS SHALL BE INSTALLED BY CONTRACTOR PRIOR TO PAVING. SEE DRAWING C2.
 5. ALL WATER VALVE BOXES AND BLOW-OFF BOX ARE TO BE INSTALLED AS SHOWN ON DETAILS VB_815 ON DRAWING T4 AND XB_811 ON DRAWING T5.
 6. WATER METER BOX AND RBPB TO BE INSTALLED BY DISTRICT PRIOR TO PAVING.

DRAIN INLET CHART

DI #	GRADE EL. FT	INVERT FT	COVER FT	NORTHING/EASTING AT CENTER OF DRAIN INLET	APPROX DISTANCE BETWEEN DI CENTER LOCATIONS
1	155.3	151.4	3.1	N:9921.44 E:10362.14	S/O TANK-DI1: 54'
2	156.5	152.1	3.4	N:9849.46 E:10361.97	DI2-DI2: 72'
3	156.7	152.4	3.3	N:9814.05 E:10351.98	DI2-DI3: 37'
4	156.7	152.6	3.1	N:9792.84 E:10333.67	DI3-DI4: 28'

COORDINATES CHART

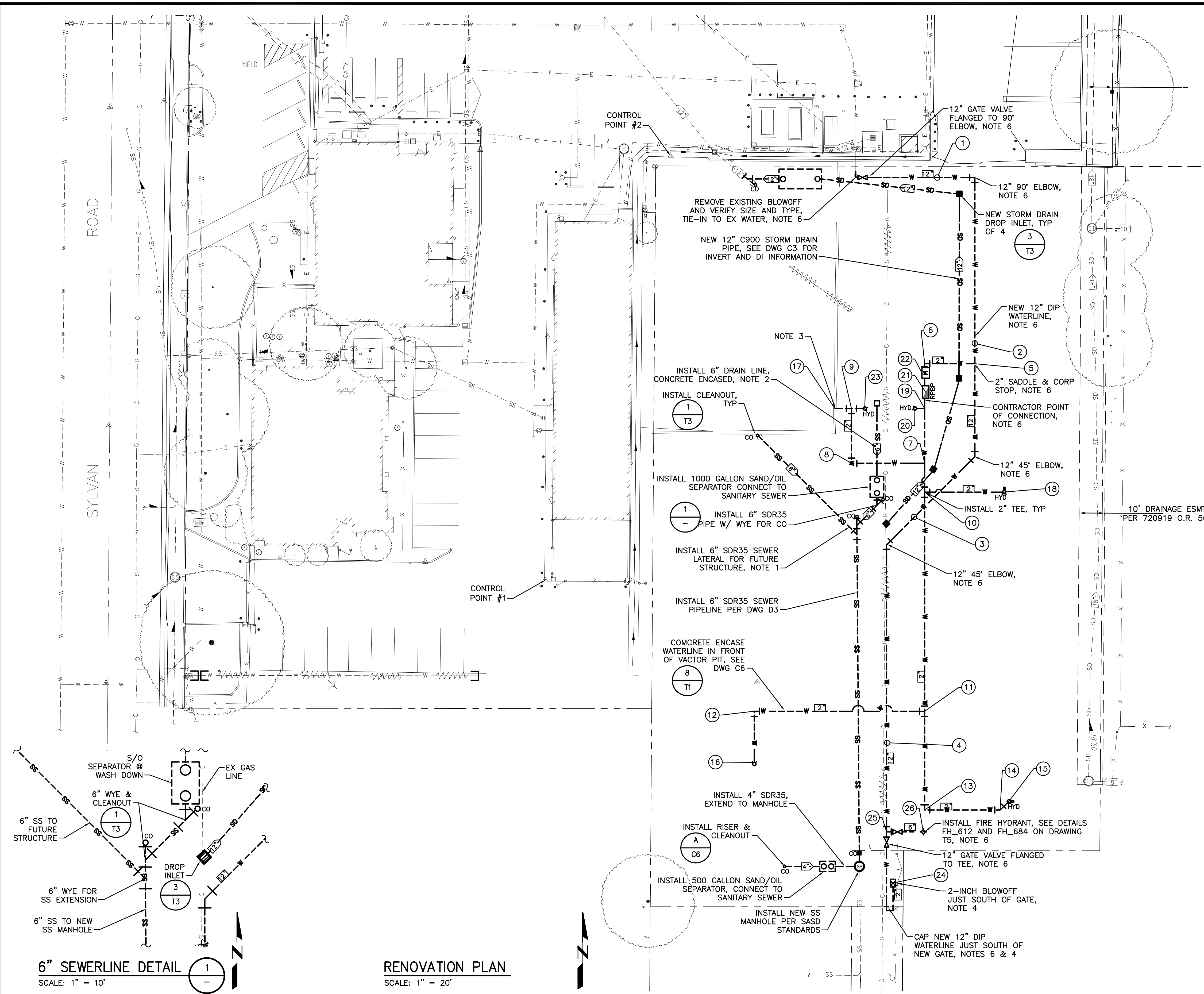
CONTROL PT #1 N:9770.87 E:10200.75 EL 157.24 CHISELED "+\" IN CONCRETE
 CONTROL PT #2 N:9936.14 E:10249.60 EL 154.41 CHISELED "+\" IN CONCRETE

MARK	NORTHING	EASTING	DESCRIPTION
1	N:9862.26	E:10322.52	NW CORNER WASH STATION
2	N:9817.26	E:10347.52	SE CORNER WASH STATION
3	N:9812.61	E:10406.92	NE CORNER MATERIALS STORAGE
4	N:9685.44	E:10380.92	SW CORNER MATERIALS STORAGE
5	N:9718.38	E:10316.75	NE CORNER VACTOR PIT
6	N:9662.38	E:10282.75	SW CORNER VACTOR PIT
7	N:9923.36	E:10291.85	SW CORNER OF 5000 GAL SEPARATOR
8	N:9931.03	E:10308.43	NE CORNER OF 5000 GAL SEPARATOR
9	N:9811.36	E:10327.35	NW CORNER OF 1000 GAL SEPARATOR
10	N:9803.18	E:10332.68	SE CORNER OF 1000 GAL SEPARATOR
11	N:9661.38	E:10313.74	NE CORNER OF 500 GAL SEPARATOR
12	N:9657.38	E:10307.74	SW CORNER OF 500 GAL SEPARATOR

GRADING PLAN
SCALE: 1" = 20'

	SCALE: AS NOTED	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17	DOMENICHELLI & ASSOCIATES 1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762 Ph: (916) 933-1997 Fax: (916) 933-4778		BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE DI. IN END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29	 6230 Sylvan Rd, Citrus Heights, CA 95610	CORPORATION YARD IMPROVEMENT PROJECT GRADING, DRAINAGE & PAVING PLAN	DRAWING C3 SHEET 6 of 28	
DATE	DESCRIPTION									

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DATE	DESCRIPTION

SCALE: AS NOTED	WARNING 1/2 1	DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17
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DOMENICHELLI & ASSOCIATES
 1101 Investment Blvd, Suite 115
 El Dorado Hills, CA 95762
 Ph: (916) 933-1997
 Fax: (916) 933-4778

REGISTERED PROFESSIONAL ENGINEER
 CIVIL
 STATE OF CALIFORNIA
 No. 064226
 Exp. 6/30/17

BENCHMARK INFORMATION:
 A.P.N. 243-0180-005, 006, 007, 009, 011, 046
 BENCHMARK NO. 14-61 ELEV. 163.13
 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29

CITRUS HEIGHTS WATER DISTRICT
 6230 Sylvan Rd, Citrus Heights, CA 95610

CORPORATION YARD IMPROVEMENT PROJECT		DRAWING C4
PIPING PLAN		SHEET 7 of 28

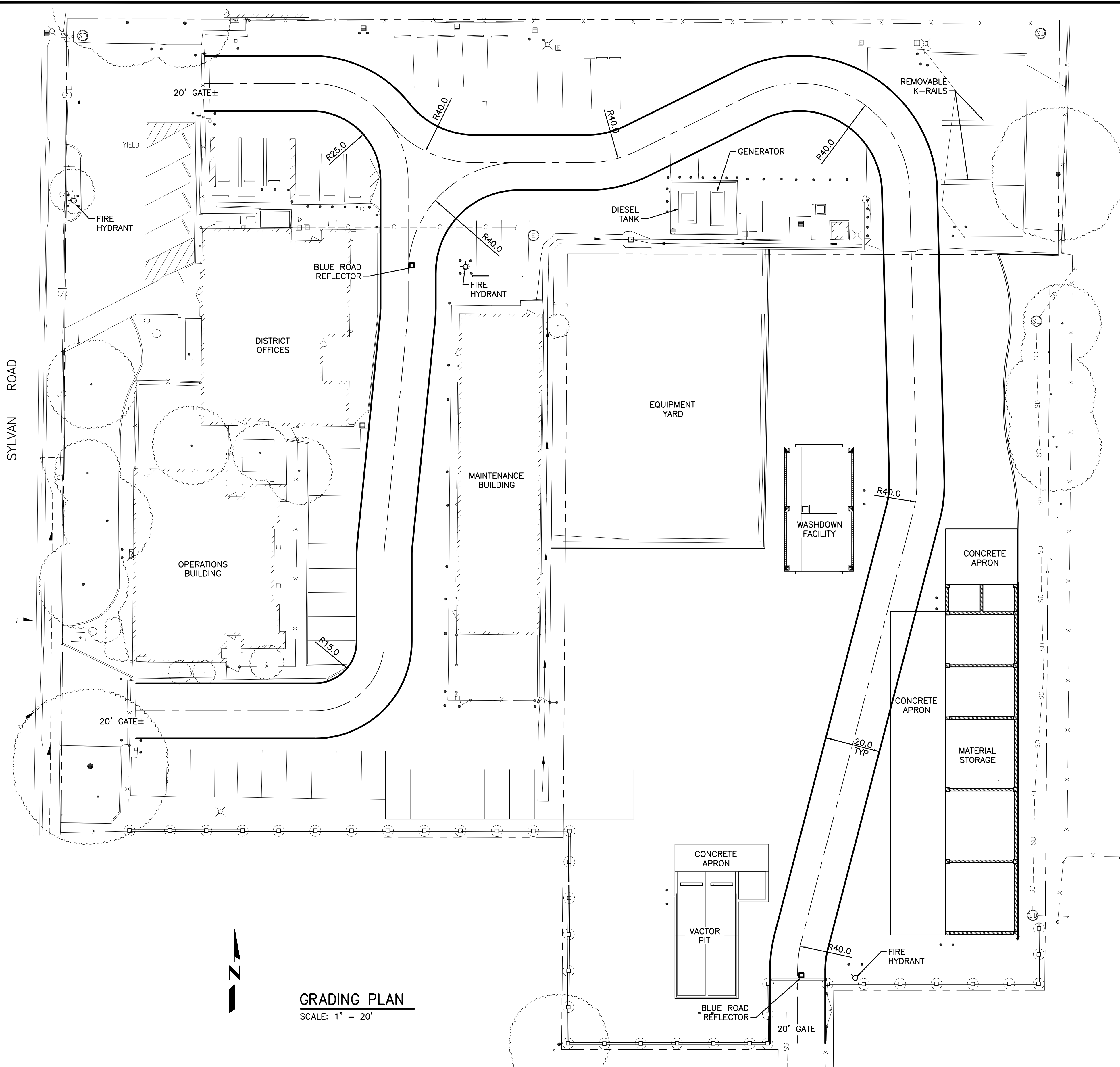
SACRAMENTO METROPOLITAN FIRE DISTRICT NOTES:

1. THE REQUIRED FIRE FLOW FOR PROTECTION OF THE PROPOSED PROJECT IS _____ GALLONS PER MINUTE (GPM), AT 20 POUNDS PER SQUARE INCH (PSI), FOR A DURATION OF _____ HOURS. THIS FLOW IS BASED ON A STRUCTURE OF TYPE _____ CONSTRUCTION OF NOT MORE THAN _____ TOTAL SQUARE FEET WITH A 50% REDUCTION FOR THE INSTALLATION OF A FULL COVERAGE AUTOMATIC FIRE SPRINKLER SYSTEM. THIS REQUIRED FIRE FLOW IS IN ADDITION TO ANY DOMESTIC WATER DEMANDS. A CHANGE IN ANY OF THESE CONDITIONS MAY INCREASE OR DECREASE THE REQUIRED FIRE FLOW.
2. REQUIRED FIRE HYDRANTS CAPABLE OF PROVIDING THE REQUIRED FIRE FLOW SHALL BE INSTALLED, TESTED, FLUSHED AND APPROVED PRIOR TO ANY CONSTRUCTION OR STORAGE OF ANY COMBUSTIBLE MATERIALS.
3. REQUIRED PRIVATE STREETS AND FIRE APPARATUS ACCESS ROADS SHALL BE INSTALLED TO THE "FIRST LIFT" (UP TO THE LAST ONE INCH OF PAVEMENT), IDENTIFIED AND APPROVED PRIOR TO CONSTRUCTION OR STORAGE OF COMBUSTIBLE MATERIALS. PRIVATE STREETS AND FIRE APPARATUS ACCESS ROADS SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOAD OF THE FIRE APPARATUS - 80,000 POUNDS.
4. THE FOLLOWING METHODS OF FIRE APPARATUS ACCESS ROAD IDENTIFICATION ARE TAKEN FROM SECTION 22500.1 OF THE CALIFORNIA VEHICLE CODE AND AMENDED BY FIRE DISTRICT POLICY. ONE OF THE THREE METHODS PRESENTED BELOW MUST BE PRESENT FOR ALL AREAS DESIGNATED AS A FIRE APPARATUS ACCESS ROAD:
 - a. POSTING OF A SIGN EVERY 50' ALONG AND IMMEDIATELY ADJACENT TO, AND VISIBLE FROM, THE DESIGNATED FIRE ACCESS LANE CLEARLY STATING IN LETTERS NOT LESS THAN ONE INCH IN HEIGHT THAT THE PLACE IS A FIRE LANE AND NO PARKING IS PERMITTED.
 - b. BY OUTLINING OR PAINTING THE PAVEMENT RED WITH APPROVED PAVEMENT PAINT AND, IN CONTRASTING COLOR, MARKING THE PAVEMENT EVERY 25' WITH WORDS "FIRE LANE - NO PARKING" WHICH ARE CLEARLY VISIBLE FROM A VEHICLE.
 - c. BY A RED CURB OR RED PAINT ON THE EDGE OF THE ROADWAY UPON WHICH IS CLEARLY MARKED EVERY 25' WITH THE WORDS "FIRE LANE - NO PARKING".
- 4.5. THE INSTALLATION OF PERIMETER FENCING, GATES, OR BARRIERS, THAT OBSTRUCTS VEHICULAR OR PEDESTRIAN INGRESS OR EGRESS TO A PROJECT SITE, BUILDING, ETC., SHALL REQUIRE A SEPARATE PLAN SUBMITTAL, REVIEW, AND APPROVAL BY THE FIRE DISTRICT PRIOR TO INSTALLATION.
6. BLUE REFLECTIVE HYDRANT MARKERS SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING:
 - a. ON UNSTRIPED ROADWAYS, BLUE MARKERS SHALL BE SET IN THE CENTER OF THE ROADWAY.
 - b. ON UNDIVIDED STRIPED ROADWAYS, BLUE MARKERS SHALL BE SET 6" TO THE HYDRANT SIDE OF THE CENTER STRIPE.
 - c. ON DIVIDED ROADWAYS, THE BLUE MARKER SHALL BE SET 6" TO THE SIDE OF THE MEDIAN OR LANE STRIPING, WHICH IS CLOSEST TO THE HYDRANT.
 - d. IN LOCATIONS WHERE HYDRANTS ARE SITUATED ON CORNERS, BLUE MARKERS SHALL BE INSTALLED ON BOTH APPROACHES FRONTING THE HYDRANT.
7. UNDERGROUND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 24, STANDARD FOR THE INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES AND THE APPROVED PLANS PREPARED BY A CIVIL ENGINEER OR PIPING INSTALLATION CONTRACTOR. THE UNDERGROUND FIRE SERVICE INSTALLATION CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL A SCHEMATIC DRAWING SHOWING THE PART FOR PART INSTALLATION ARRANGEMENT OF THE UNDERGROUND PIPING AND APPURTENANCES AND A PARTS LIST WITH LISTING INFORMATION FOR ALL PARTS PRIOR TO INSTALLATION. A TRENCH CROSS SECTIONAL DETAIL SHALL BE INCLUDED ON THE PLANS.
8. PLASTIC PIPING APPROVED FOR UNDERGROUND INSTALLATIONS SHALL BE PVC, C900, CLASS 150 OR GREATER, AND BE LISTED FOR SUCH USE.
9. ALL RUNS OF NON-METALLIC WATER PIPE SHALL HAVE A NO. 10 GAUGE SOLID SOFT DRAWN COPPER LOCATOR WIRE TAPED ON TOP OF THE PIPE TO FACILITATE LOCATING THE PIPE AT A LATER DATE. THE WIRE SHALL BE STUBBED UP INSIDE EACH VALVE BOX. CONTINUITY TEST SHALL BE CONDUCTED ON EACH SPLICE AT ALL LOCATIONS.
10. GALVANIZED PIPE IS NOT APPROVED FOR UNDERGROUND SUPPLY PIPING.
11. NON-METALLIC PIPE SHALL NOT BE USED WITHIN FIVE FEET OF A BUILDING.
12. ABOVE GRADE VALVES FOR CONTROLLING THE WATER SUPPLY FOR ON-SITE FIRE HYDRANTS AND AUTOMATIC FIRE SPRINKLER SYSTEMS SHALL BE ELECTRICALLY SUPERVISED.
13. ALL PIPING SHALL BE LAID IN A SIX INCH BED OF SAND OR NATURAL GRAVEL NOT OVER ONE INCH IN DIAMETER AND HAVE A TWELVE INCH FILL OF SAND OR NATURAL GRAVEL NOT OVER ONE INCH IN DIAMETER.
14. A STRAND OF 3" WIDE NON-DETECTABLE BLUE TAPE MARKED "WATER" SHALL BE PLACED 12 INCHES ABOVE ALL PIPING.
15. ALL SECTIONS OF DUCTILE IRON PIPE OR DUCTILE IRON FITTINGS SHALL BE ENCASED IN EITHER 8-MIL LINEAR LOW DENSITY (LLD) OR 4-MIL HIGH-DENSITY, CROSS-LAMINATED (HDCL) POLYETHYLENE SHEETS OR TUBES IN ACCORDANCE WITH AMERICAN WATER WORKS ASSOCIATION STANDARD C105/A21.5-05, POLYETHYLENE ENCASEMENT FOR DUCTILE-IRON PIPE SYSTEMS. ANY FASTENERS SHALL BE MADE OF LOW-ALLOY STEEL.
16. CONCRETE THRUST BLOCKS OR OTHER APPROVED RETAINING, SHALL BE INSTALLED AT ALL LOCATIONS WHERE PIPING CHANGES DIRECTION.
17. A 200-PSI HYDROSTATIC PRESSURE TEST SHALL BE PERFORMED ON ALL INSTALLED PIPING AND APPURTENANCES FOR A PERIOD OF TWO HOURS. THE PIPING SHALL BE CENTER-LOADED DURING PRESSURE TESTING WITH ALL JOINTS, FITTINGS AND APPURTENANCES UNCOVERED. FAILURE TO COMPLY WITH THIS SECTION WILL RESULT IN A TEST FAILURE AND THE UNCOVERING OF THE PIPING FOR A VISUAL INSPECTION AND RETESTING.
18. A FIRE SPRINKLER UNDERGROUND SUPPLY PIPING FLUSH, USING A FULL PIPE DIAMETER DISCHARGE, SHALL BE CONDUCTED AND WITNESSED BY THE FIRE DISTRICT PRIOR TO CONNECTION TO THE ABOVE GROUND FIRE SPRINKLER SYSTEM. THE FIRE DEPARTMENT CONNECTION PIPING SHALL ALSO BE FLUSHED IF CONNECTED TO THE FIRE SPRINKLER SUPPLY PIPING BELOW GRADE. PIPING SHALL BE FLUSHED UNTIL ALL FOREIGN OBJECTS HAVE BEEN DISCHARGED AND THE WATER IS CLEAR.
19. A FIRE HYDRANT FLUSH, USING A FULL PIPE DIAMETER DISCHARGE, SHALL BE CONDUCTED AT ALL HYDRANT LOCATIONS AND WITNESSED BY THE FIRE DISTRICT. PIPING SHALL BE FLUSHED UNTIL ALL FOREIGN OBJECTS HAVE BEEN DISCHARGED AND THE WATER IS CLEAR.

SACRAMENTO METROPOLITAN FIRE DISTRICT PLAN APPROVAL

DATE _____ GREGORY CASSENTINI, AC/FIRE MARSHAL

EXPIRES ONE YEAR AFTER SIGNATURE.

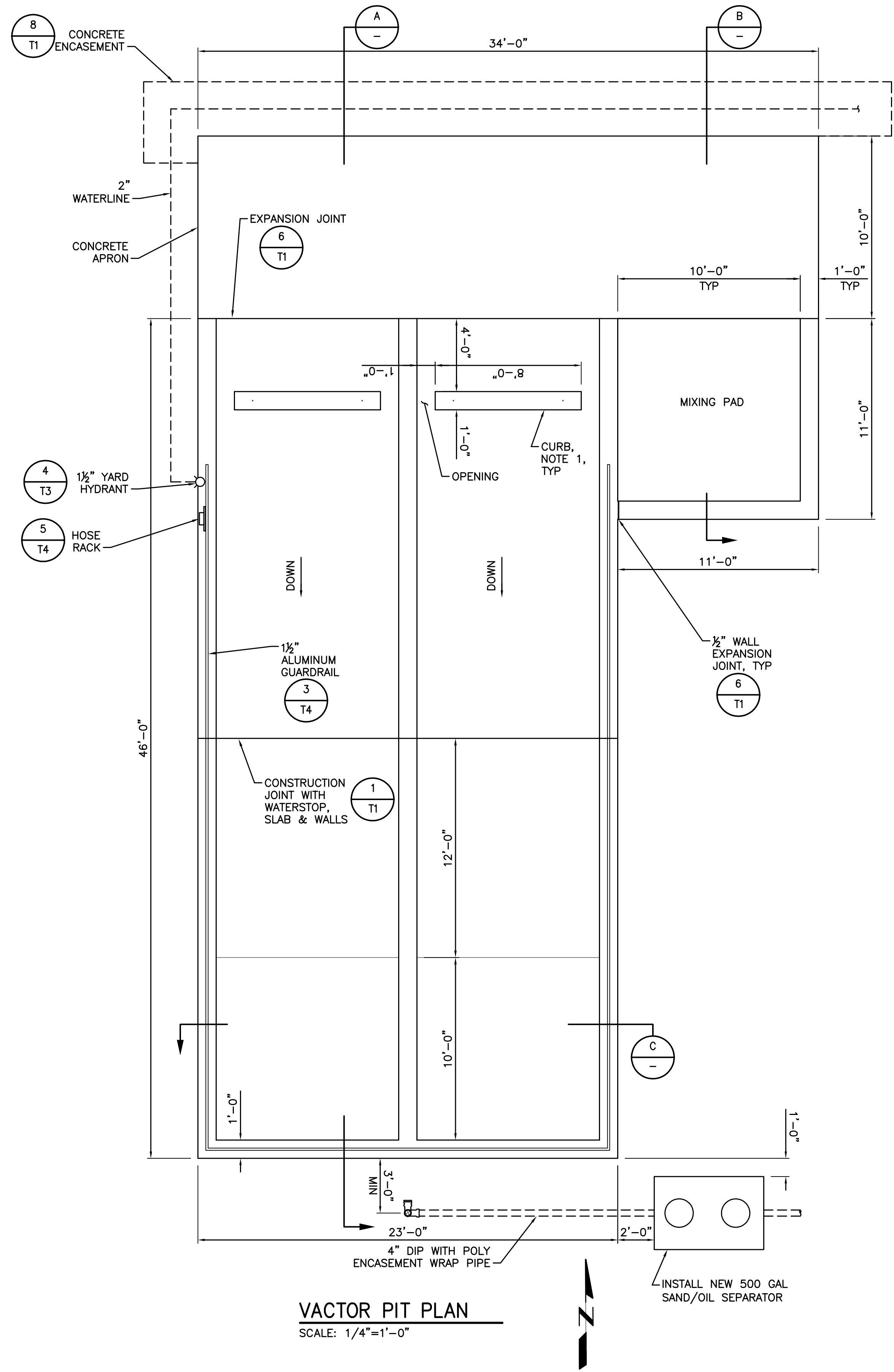


GRADING PLAN
SCALE: 1" = 20'

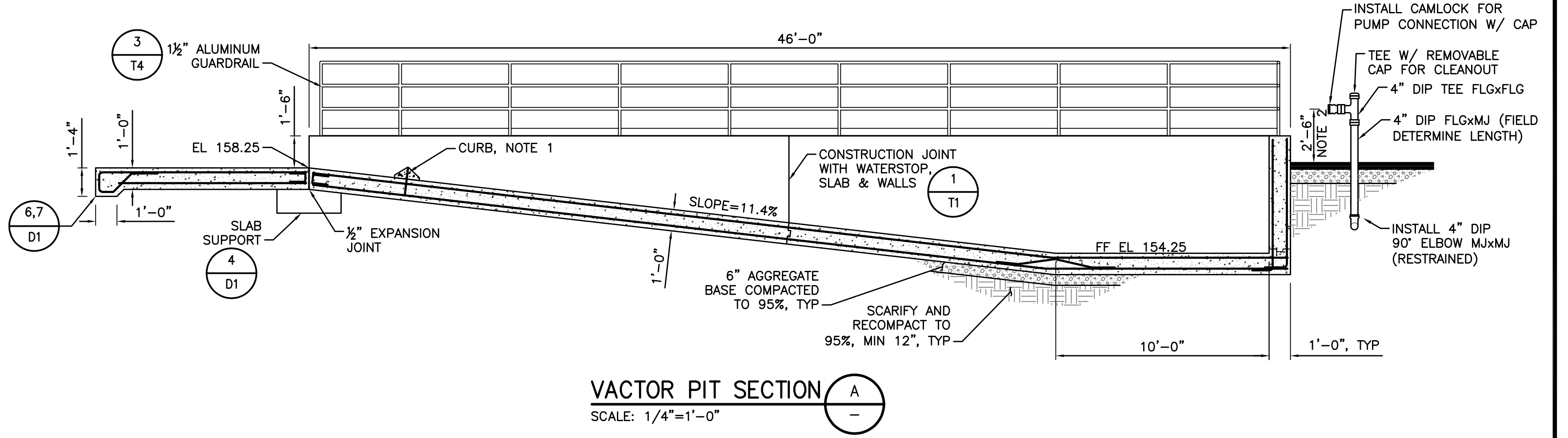
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DATE	DESCRIPTION	SCALE:	WARNING	DESIGNED DARYL W. HEIGHER	DOMENICHELLI & ASSOCIATES 1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762 Ph: (916) 933-1997 Fax: (916) 933-4778	BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29	 CITRUS HEIGHTS WATER DISTRICT 6230 Sylvan Rd, Citrus Heights, CA 95610	CORPORATION YARD IMPROVEMENT PROJECT		DRAWING
		AS NOTED	0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DRAWN JIM CADE				CHECKED SARA ROGERS	DATE 05/03/17	FIRE LANE PLAN
								SHEET	of 28	
								8	of 28	

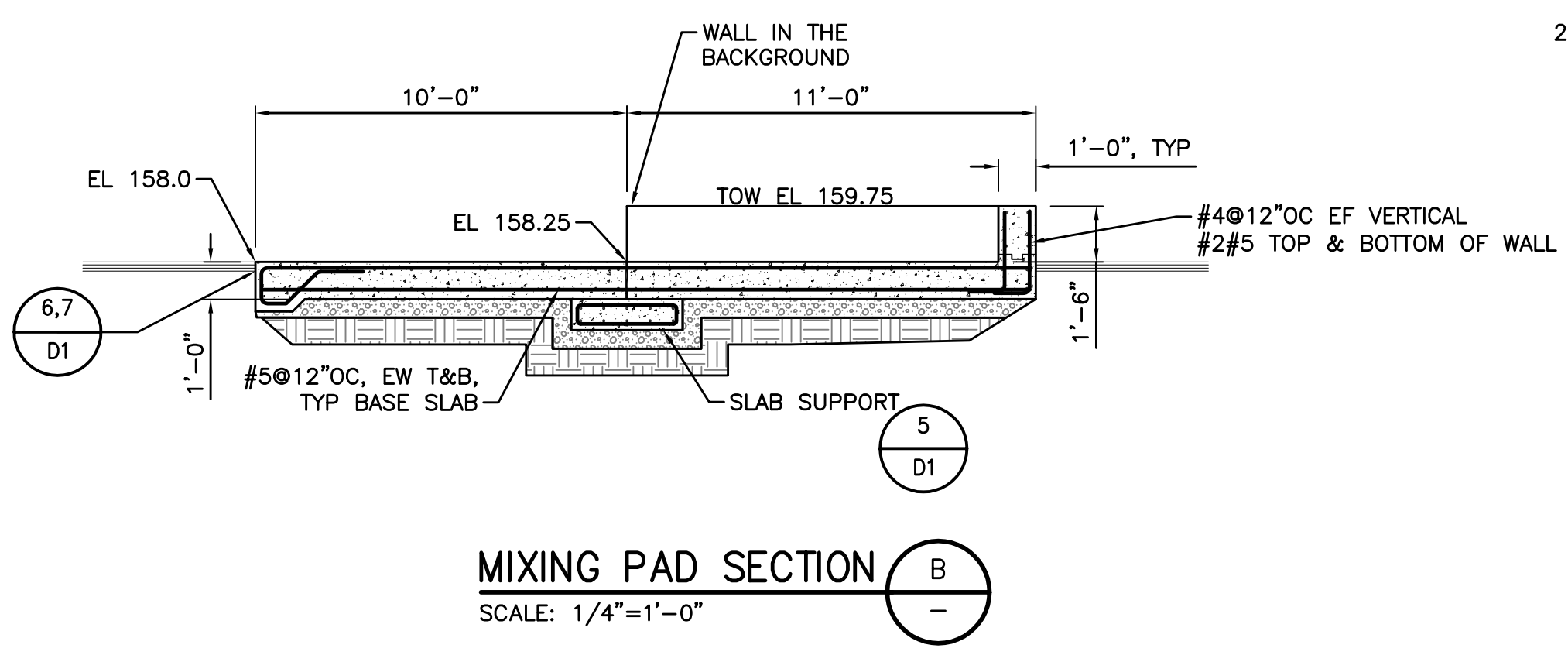
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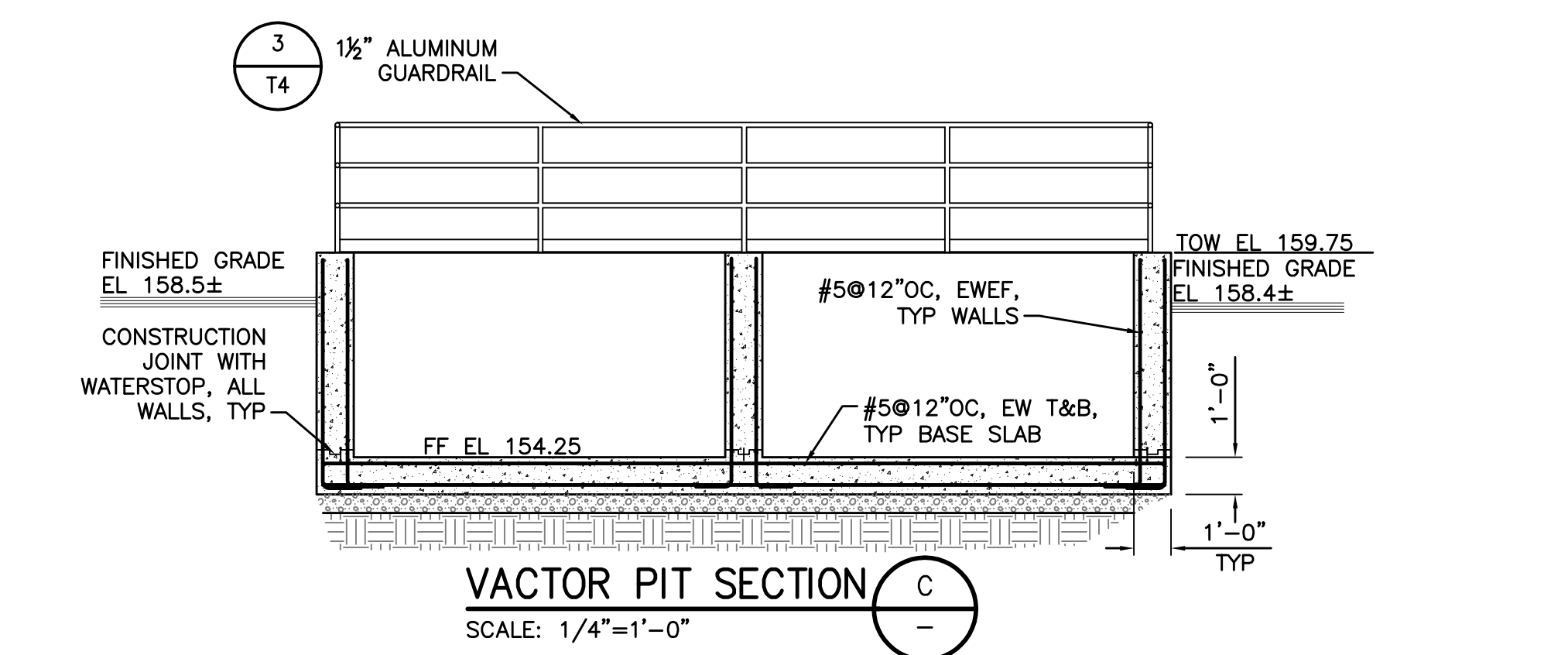
VACTOR PIT PLAN
SCALE: 1/4"=1'-0"



VACTOR PIT SECTION A
SCALE: 1/4"=1'-0"



MIXING PAD SECTION B
SCALE: 1/4"=1'-0"



VACTOR PIT SECTION C
SCALE: 1/4"=1'-0"

- NOTES:**
1. CURB TO BE A JENSEN PRECAST PARKING CURB-14065-L96-2 WITH #5 BAR DOWEL PINS, EPOXY SET INTO CONCRETE BASE OR EQUAL.
 2. COORDINATE HEIGHT OF CAMLOCK SO NOT TO BE OBSTRUCTED BY RAILING.

DATE	DESCRIPTION

SCALE: AS NOTED	WARNING 1/2 1	DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17
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DOMENICHELLI & ASSOCIATES

1101 Investment Blvd, Suite 115
El Dorado Hills, CA 95762

Ph: (916) 933-1997
Fax: (916) 933-4778

BENCHMARK INFORMATION:
A.P.N. 243-0180-005, 006, 007, 009, 011, 046
BENCHMARK NO. 14-61 ELEV. 163.13
7/8" METAL DISC STAMPED "CO. B.M. 14-61"
LOCATED IN CHISELED SQUARE IN TOP OF
VERTICAL CURB ABOVE D.I. N END OF CURB
RETURN AT THE NORTHWEST CORNER OF
GREENBACK LANE & SYLVAN RD.
VERTICAL DATUM - NAVD 29

CITRUS HEIGHTS WATER DISTRICT

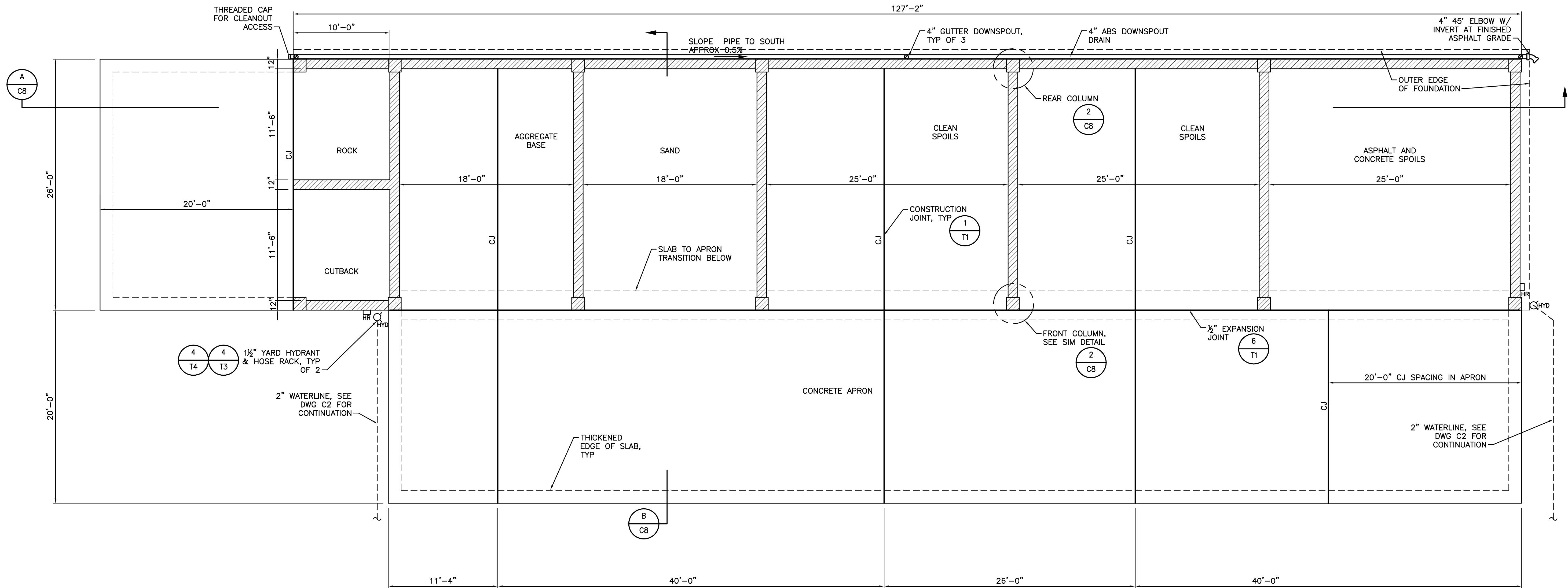
6230 Sylvan Rd, Citrus Heights, CA 95610

CORPORATION YARD IMPROVEMENT PROJECT

VACTOR PIT PLAN & SECTIONS

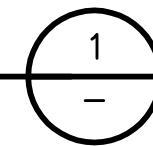
DRAWING C6	SHEET 9	of 28
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MATERIAL STORAGE PLAN

SCALE: 3/16"=1'-0"

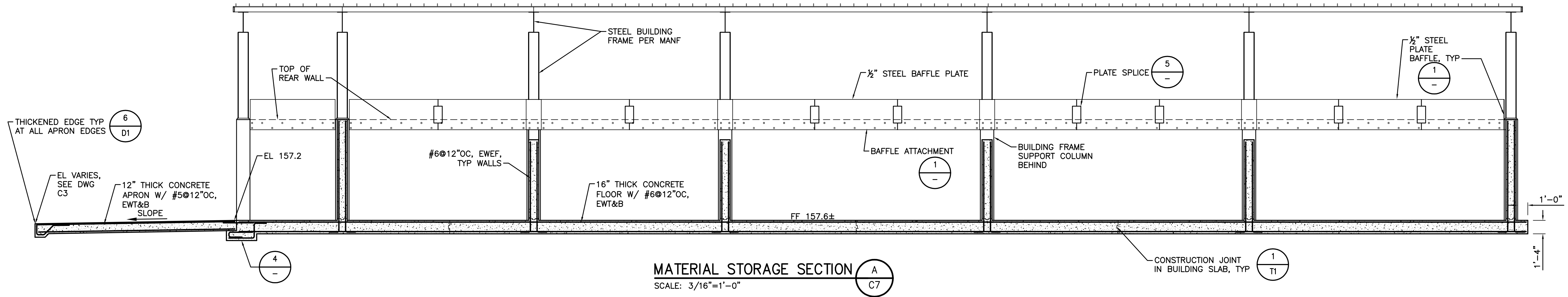


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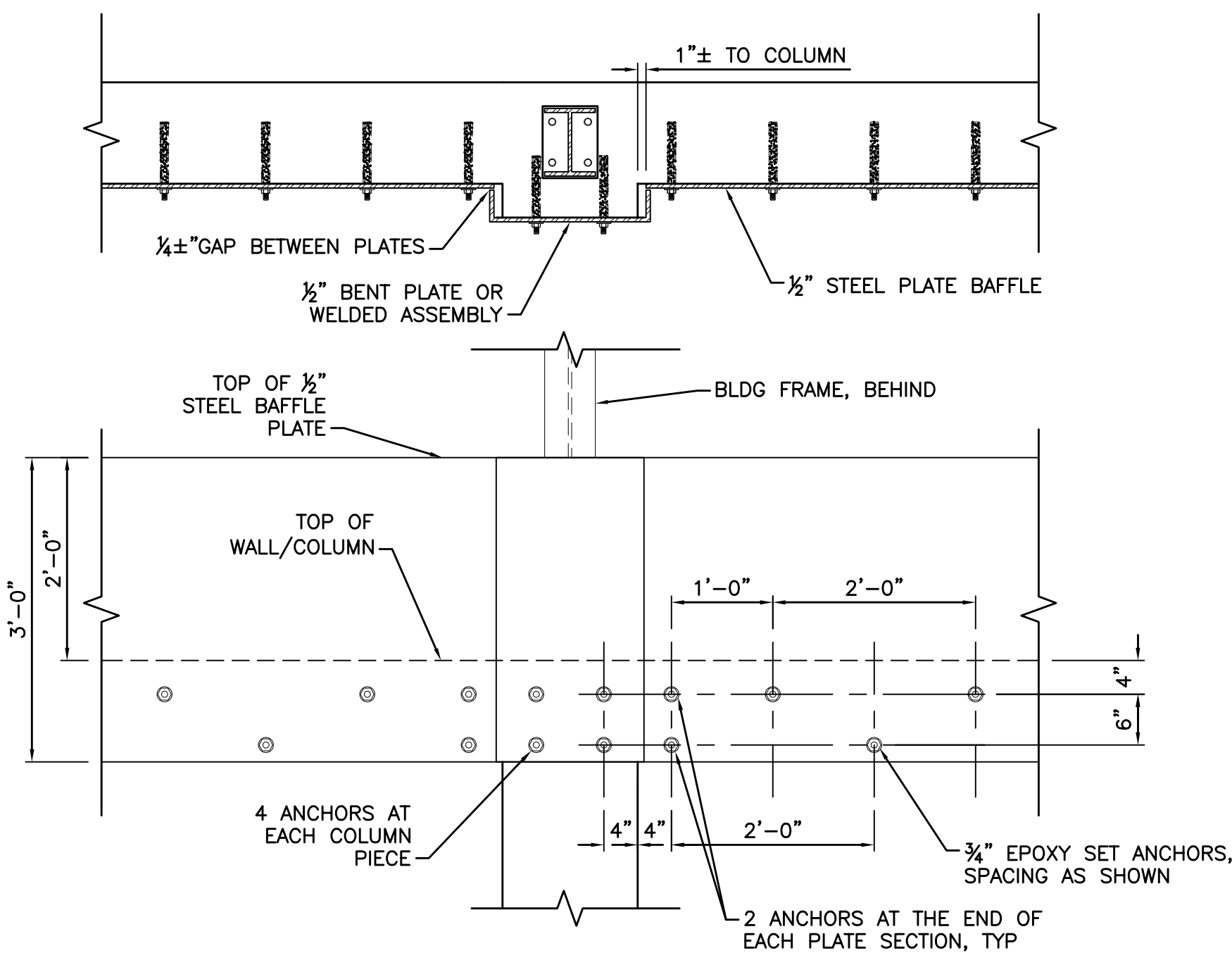
1. ALL SLABS AND WALLS SHALL BE CAST IN A CHECKERBOARD PATTERN. MINIMUM 7 DAYS BETWEEN CASTINGS.
2. SEE DRAWING C3 FOR FLOOR ELEVATIONS.

DATE		DESCRIPTION		SCALE: AS NOTED	<p>WARNING IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.</p>	DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17	<p>DOMENICHELLI & ASSOCIATES</p> <p>1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762</p> <p>Ph: (916) 933-1997 Fax: (916) 933-4778</p>		BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29	<p>CITRUS HEIGHTS WATER DISTRICT</p> <p>6230 Sylvan Rd, Citrus Heights, CA 95610</p>	CORPORATION YARD IMPROVEMENT PROJECT		DRAWING C7	
MATERIAL STORAGE PLAN										SHEET 10		of 28		

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MATERIAL STORAGE SECTION A
SCALE: 3/16"=1'-0"



BAFFLE DETAIL
SCALE: 3/4"=1'-0"

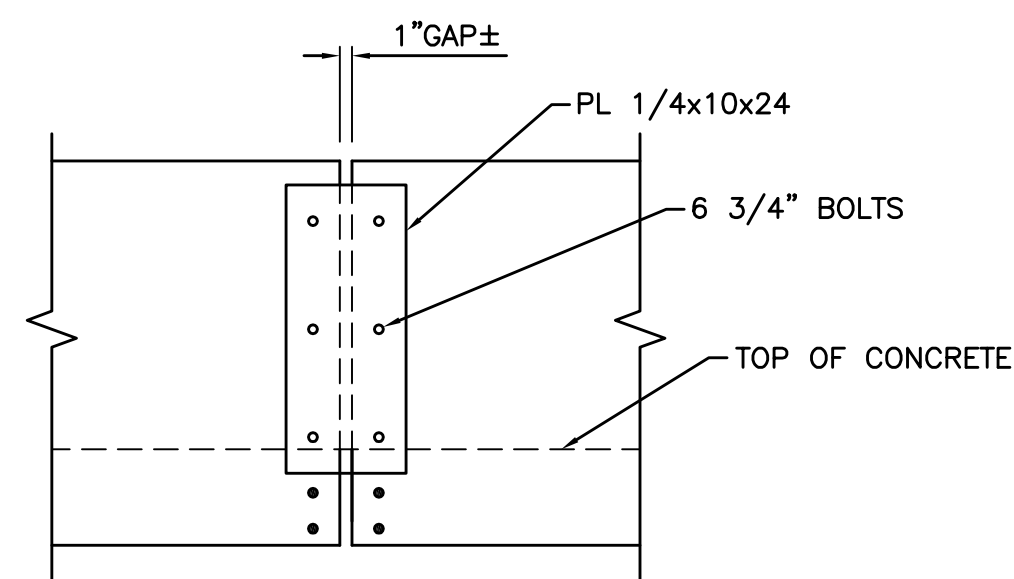
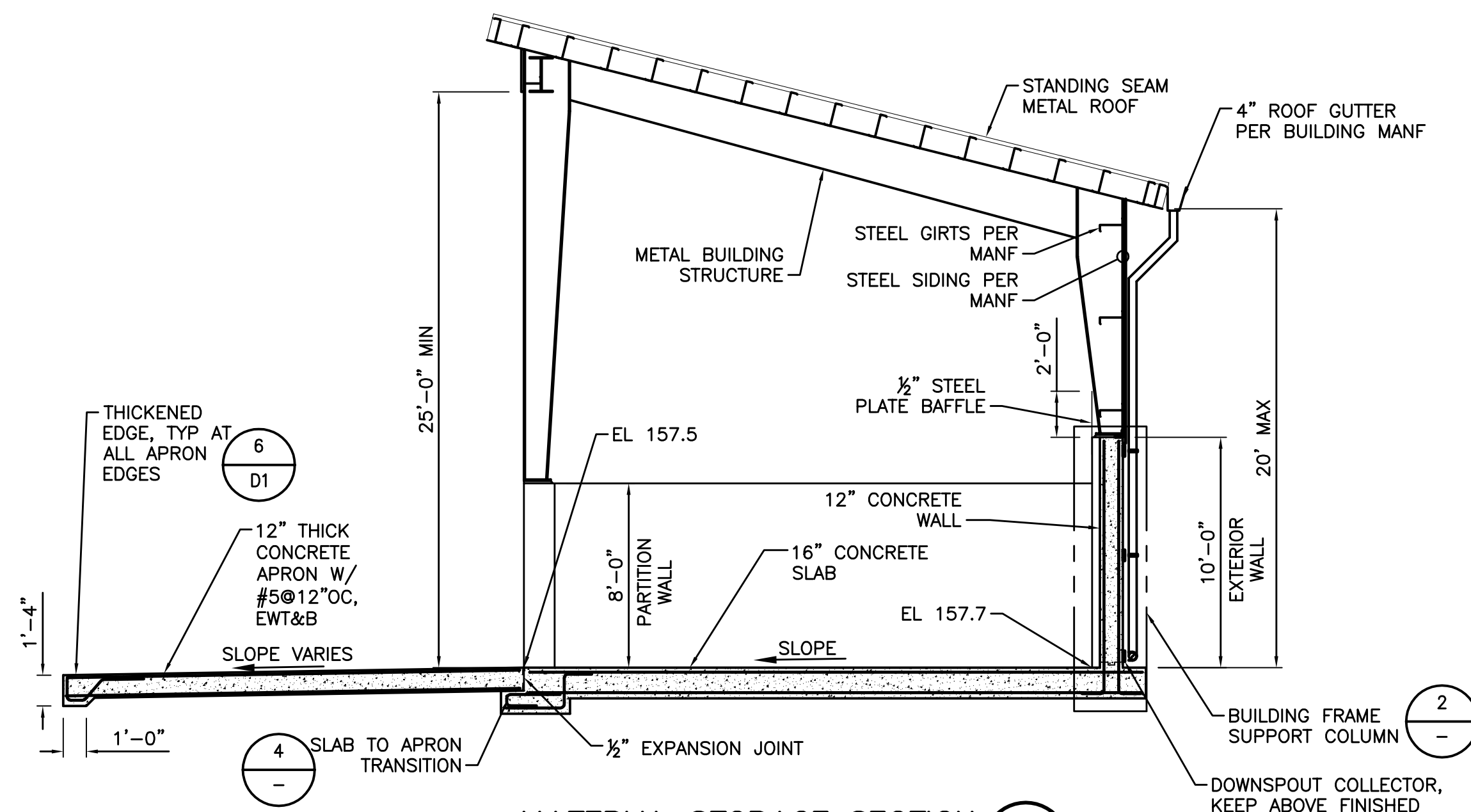
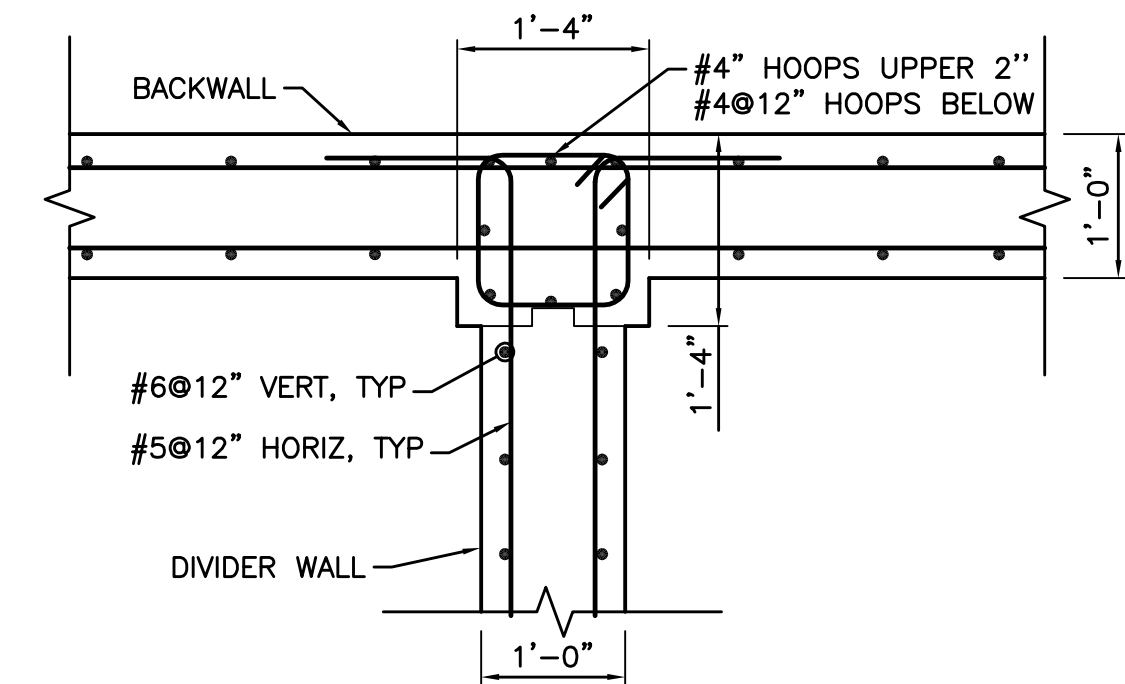


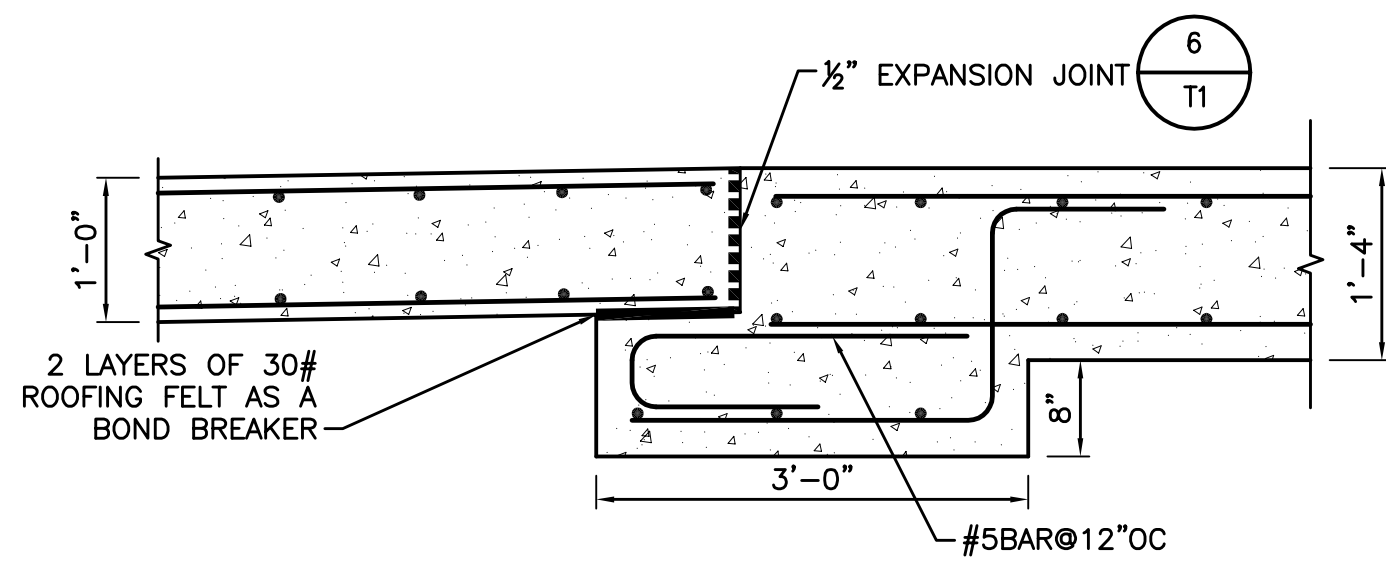
PLATE SPLICE DETAIL
SCALE: 3/4"=1'-0"



MATERIAL STORAGE SECTION B
SCALE: 3/16"=1'-0"



BACKWALL TO DIVIDER WALL & COLUMN DETAIL
SCALE: 3/4"=1'-0"



SLAB TO APRON TRANSITION DETAIL
SCALE: 3/4"=1'-0"

DATE	DESCRIPTION

SCALE: AS NOTED	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17
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DOMENICHELLI & ASSOCIATES
1101 Investment Blvd, Suite 115
El Dorado Hills, CA 95762
Ph: (916) 933-1997
Fax: (916) 933-4778

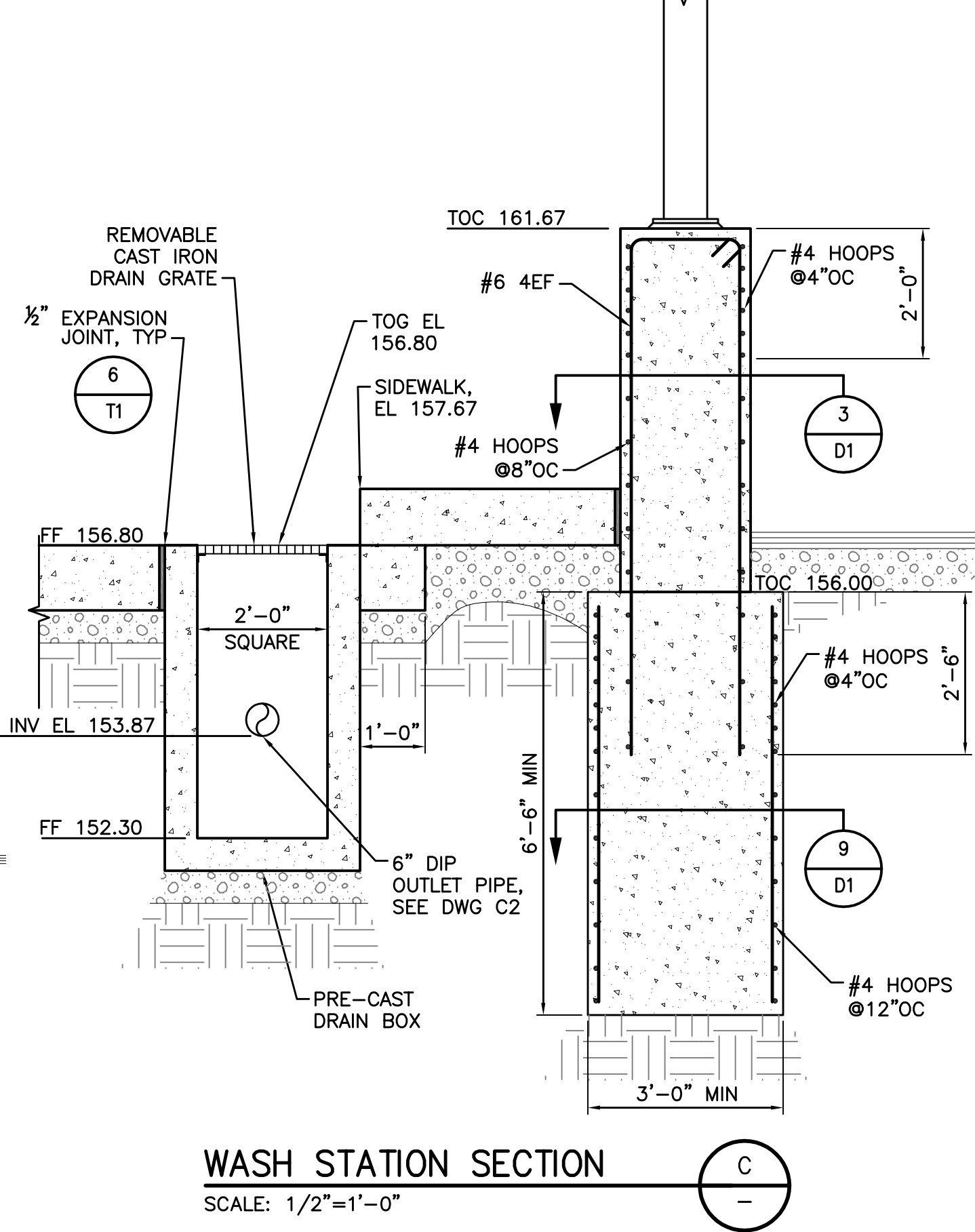
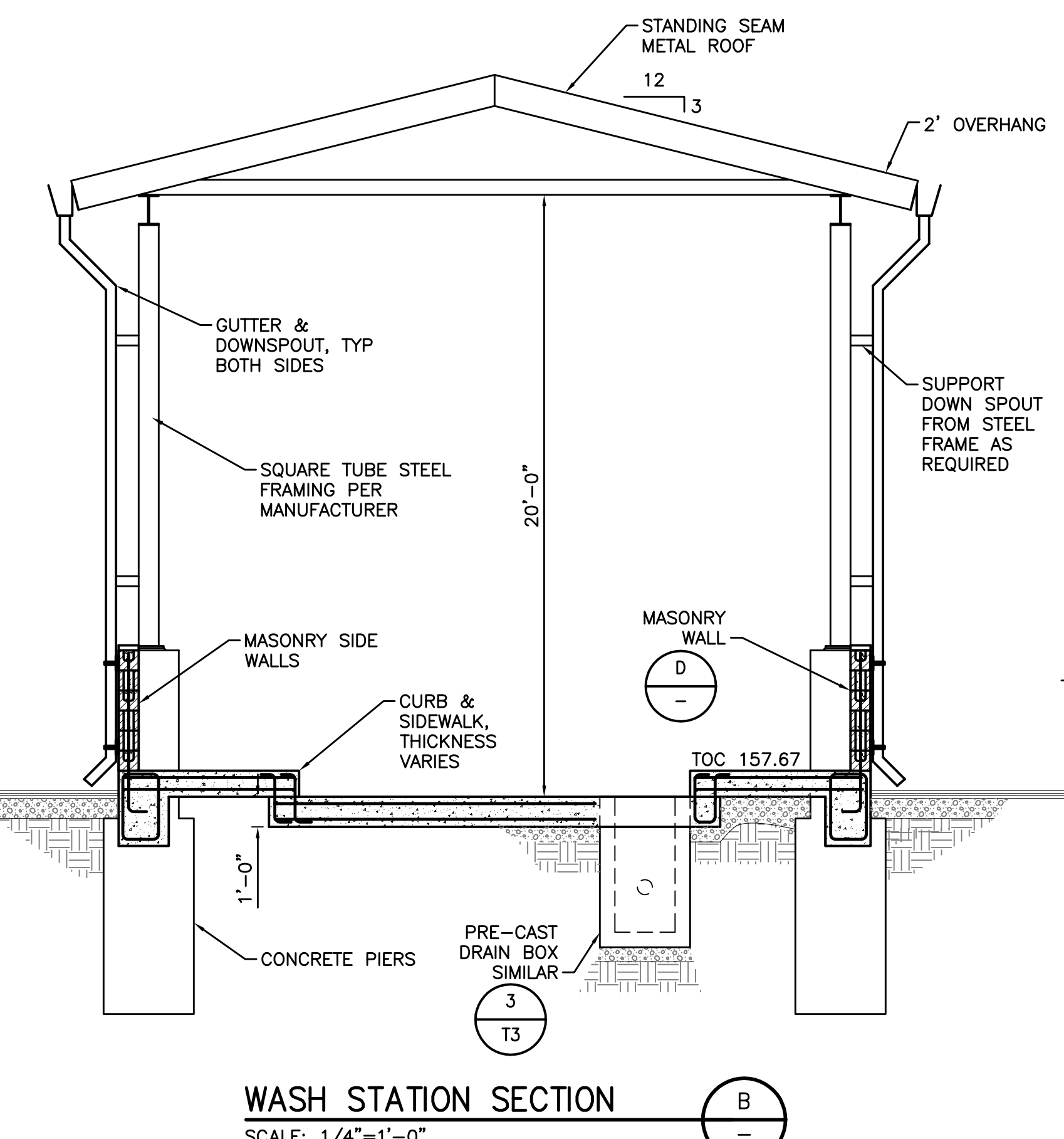
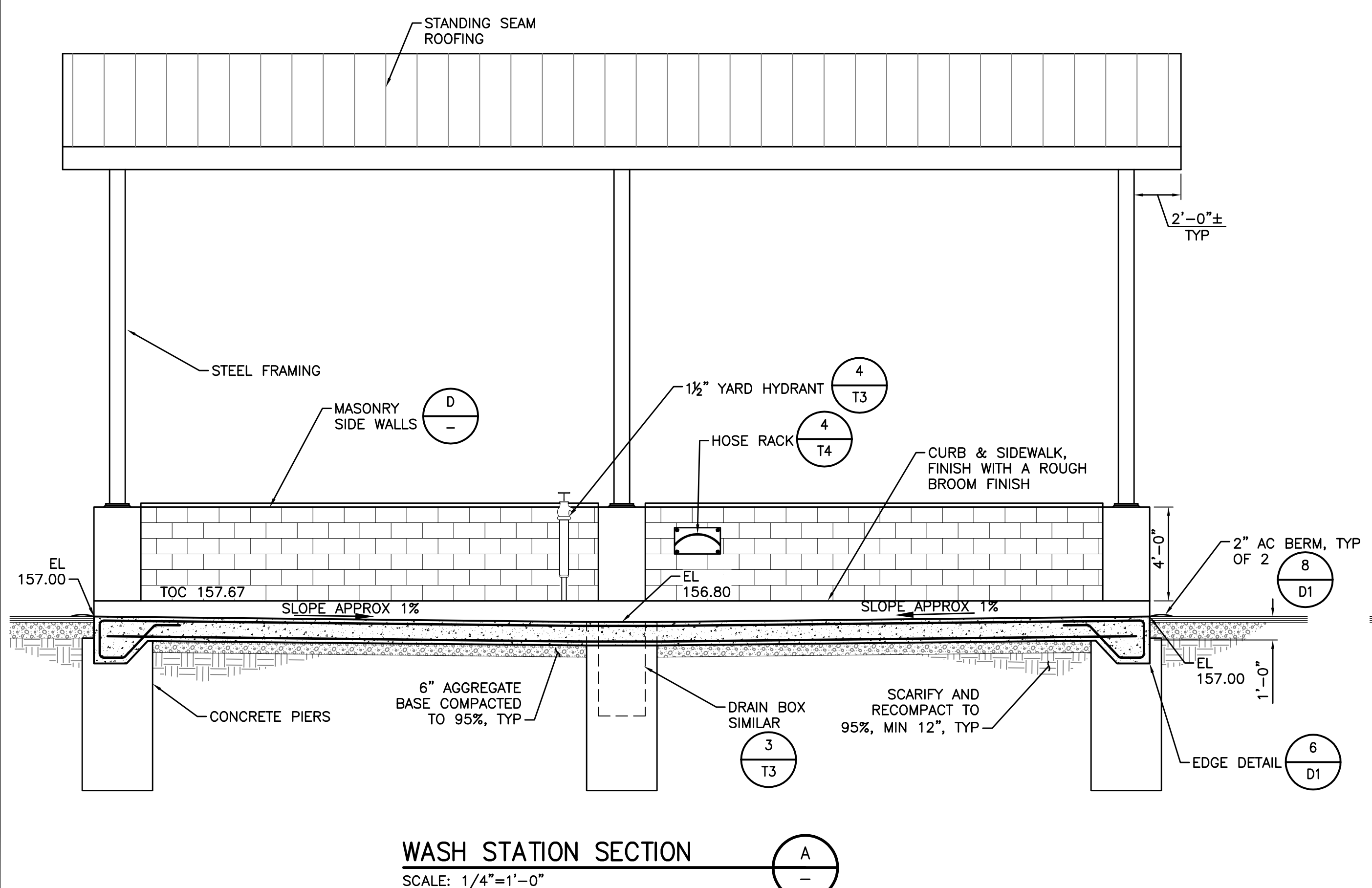
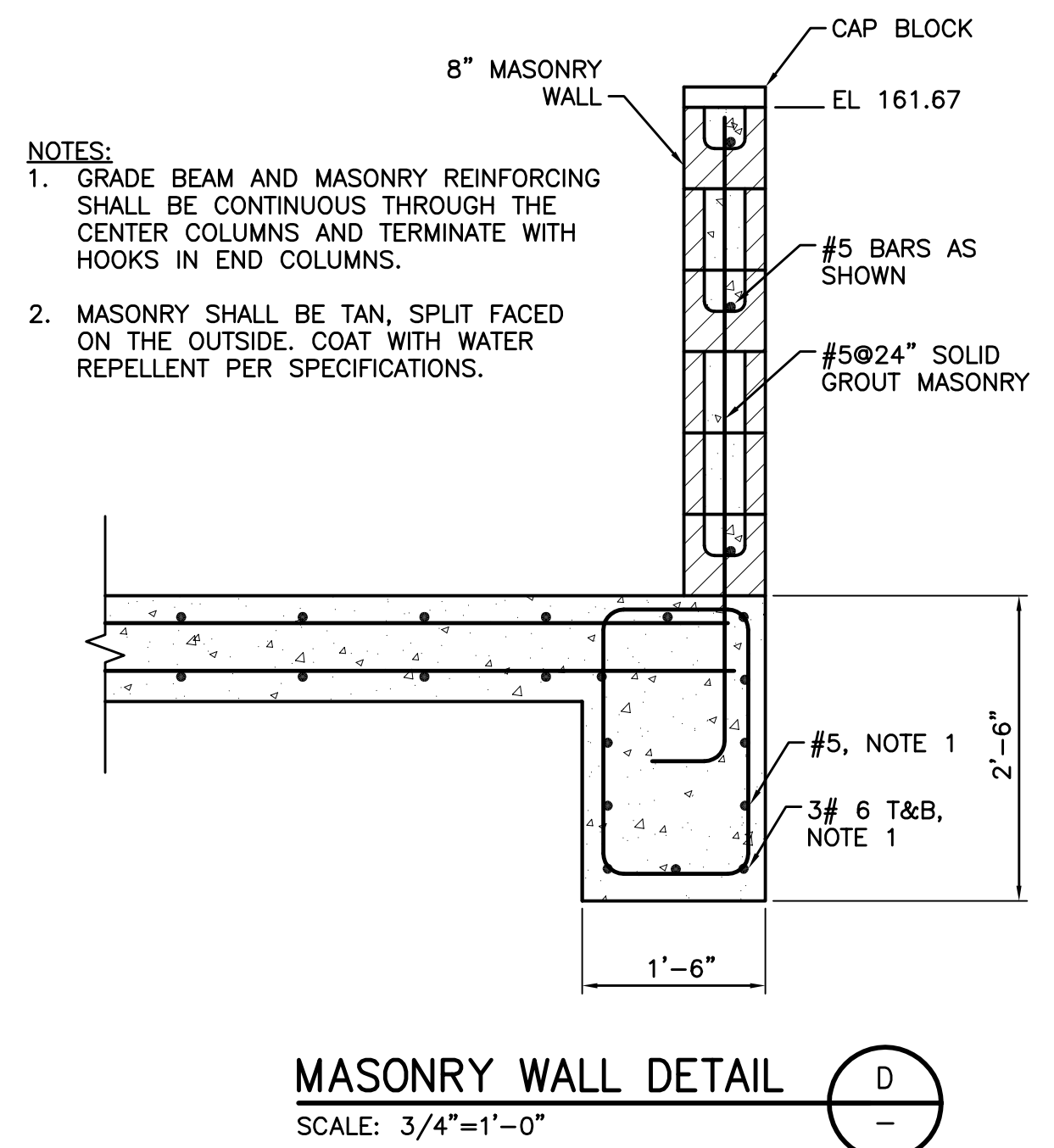
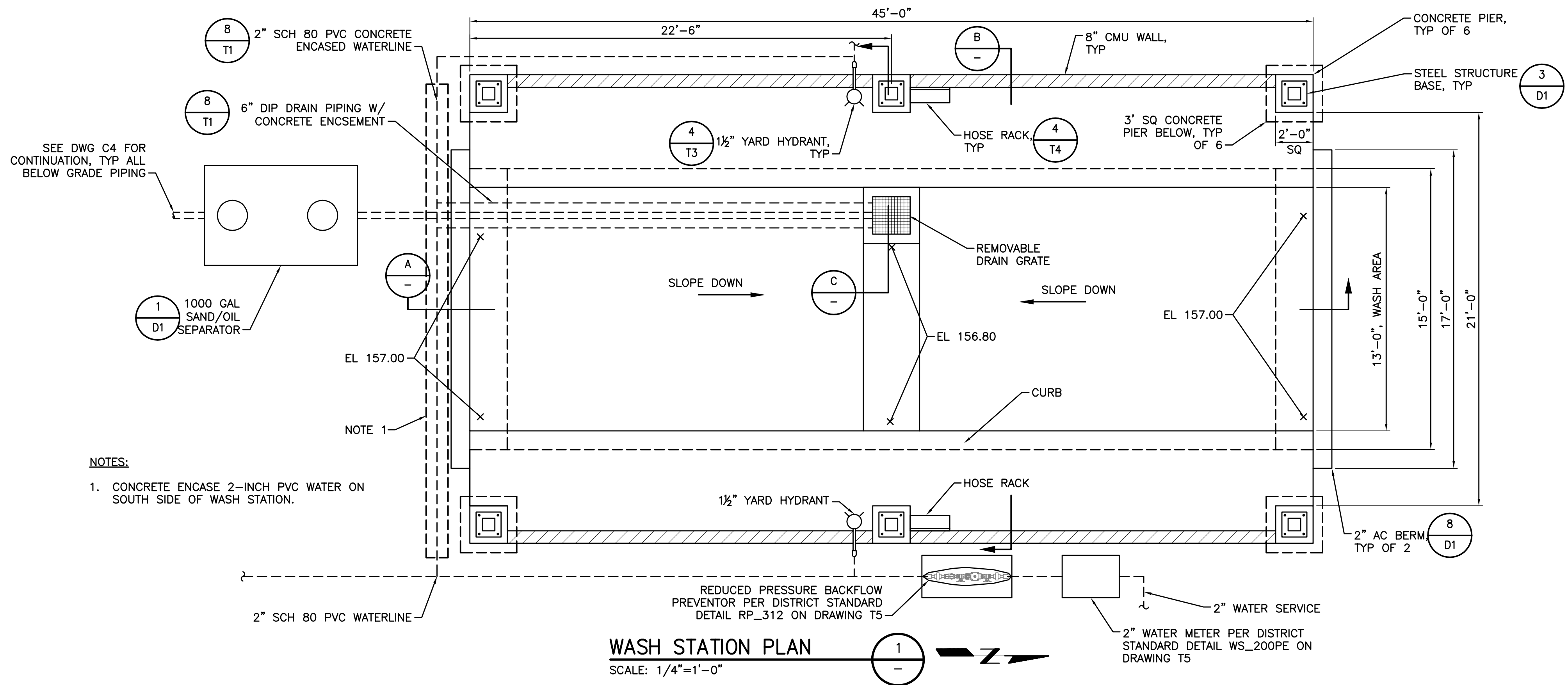
REGISTERED PROFESSIONAL ENGINEER
SARA M. ROGERS
NO. C64226
Exp. 6/30/17
STATE OF CALIFORNIA

BENCHMARK INFORMATION:
A.P.N. 243-0180-005, 006, 007, 009, 011, 046
BENCHMARK NO. 14-61 ELEV. 163.13
7/8" METAL DISC STAMPED "CO. B.M. 14-61"
LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB
RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD.
VERTICAL DATUM - NAVD 29

CITRUS HEIGHTS WATER DISTRICT
6230 Sylvan Rd, Citrus Heights, CA 95610

CORPORATION YARD IMPROVEMENT PROJECT	
MATERIAL STORAGE SECTIONS & DETAILS	

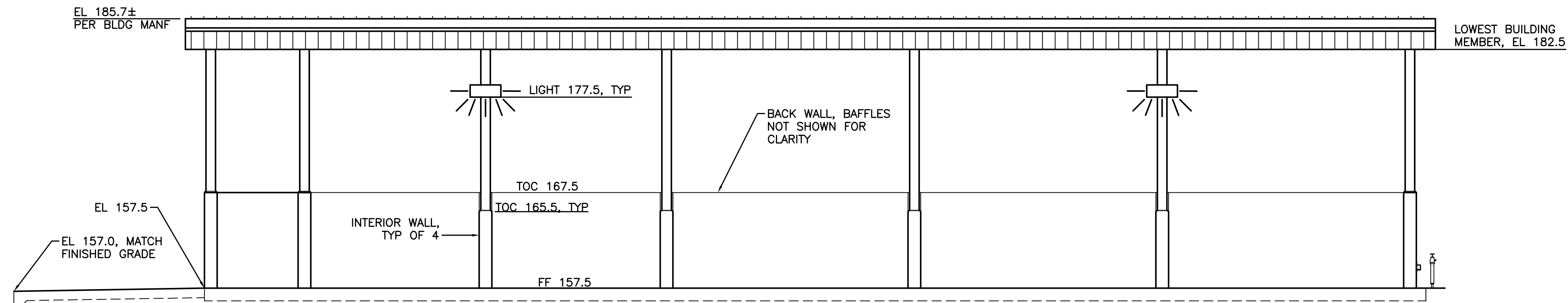
DRAWING C8	
SHEET 11	of 28



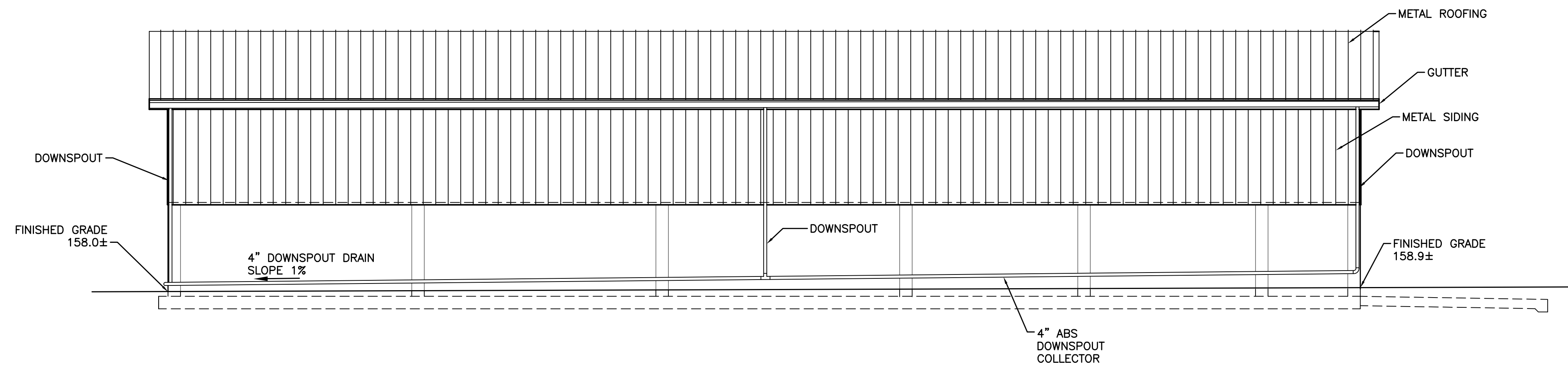
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DATE		DESCRIPTION		SCALE: AS NOTED	WARNING 1/2 1	DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17	DOMENICHELLI & ASSOCIATES 1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762 Ph: (916) 933-1997 Fax: (916) 933-4778		BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. IN END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29		CORPORATION YARD IMPROVEMENT PROJECT	DRAWING C9	
WASH STATION PLAN & SECTIONS												SHEET 12	of 28

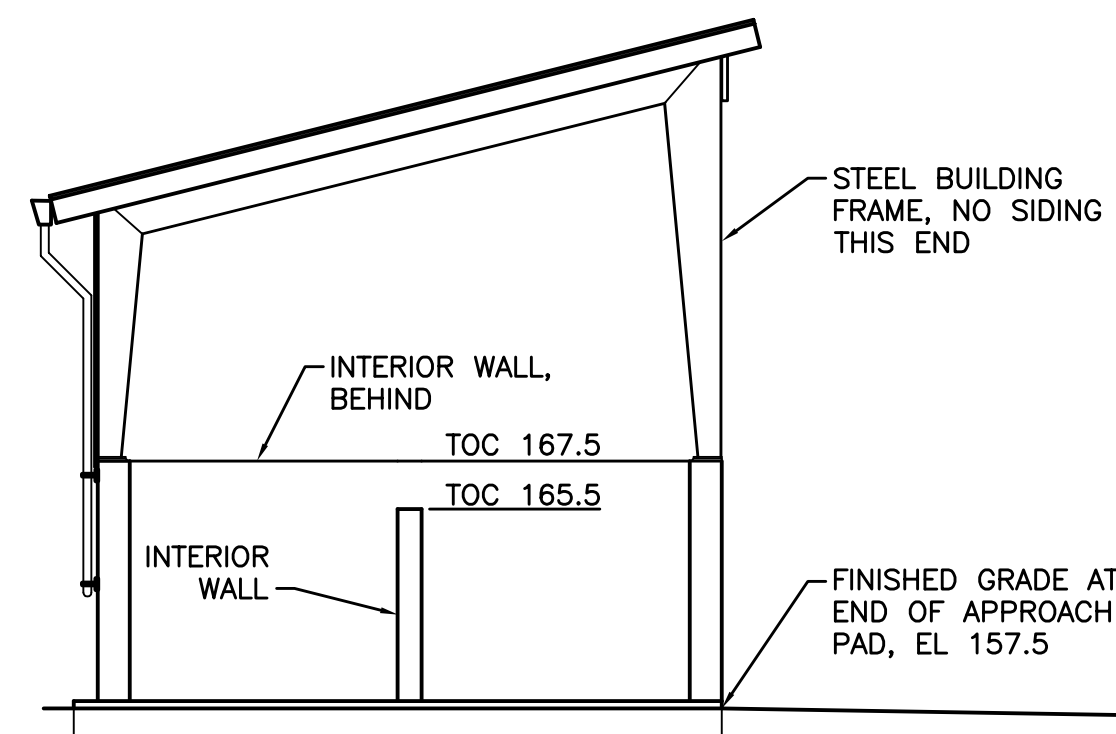
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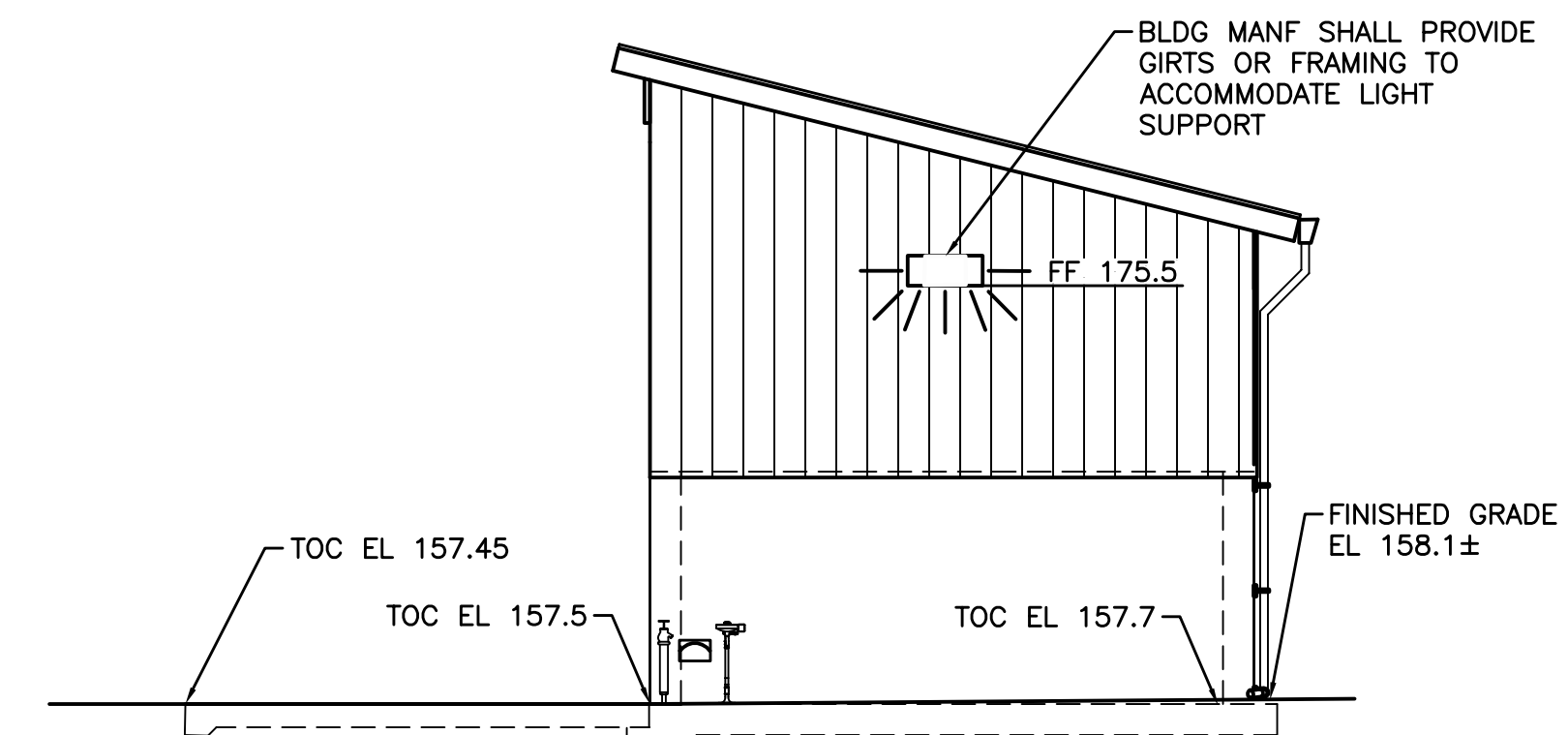
**MATERIAL STORAGE
WEST ELEVATION**
SCALE: 1/8"=1'-0"



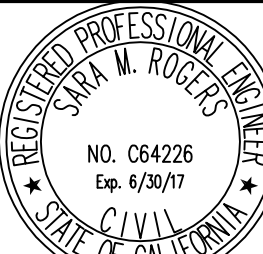

**MATERIAL STORAGE
EAST ELEVATION**
SCALE: 1/8"=1'-0"

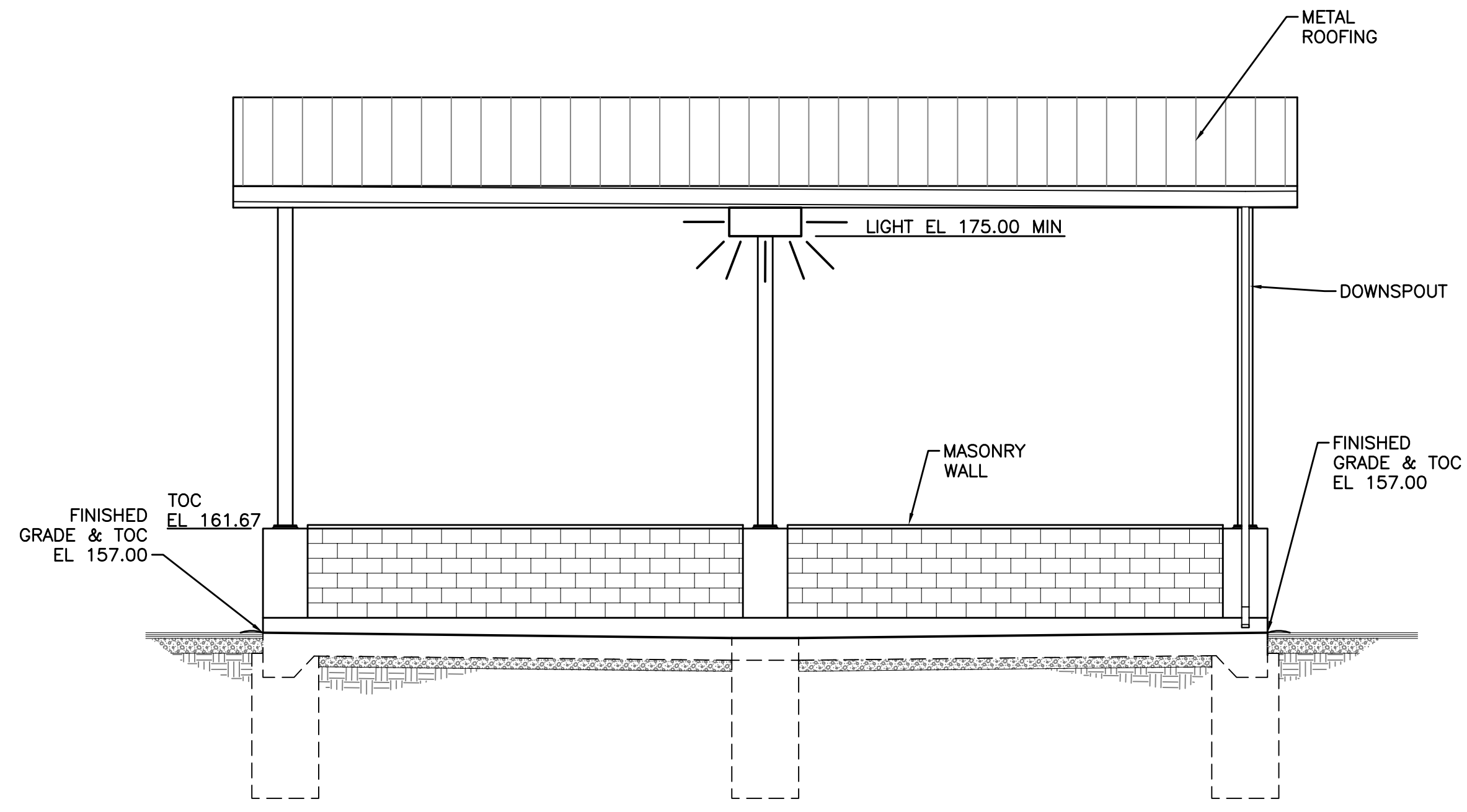


**MATERIAL STORAGE
NORTH ELEVATION**
SCALE: 1/8"=1'-0"

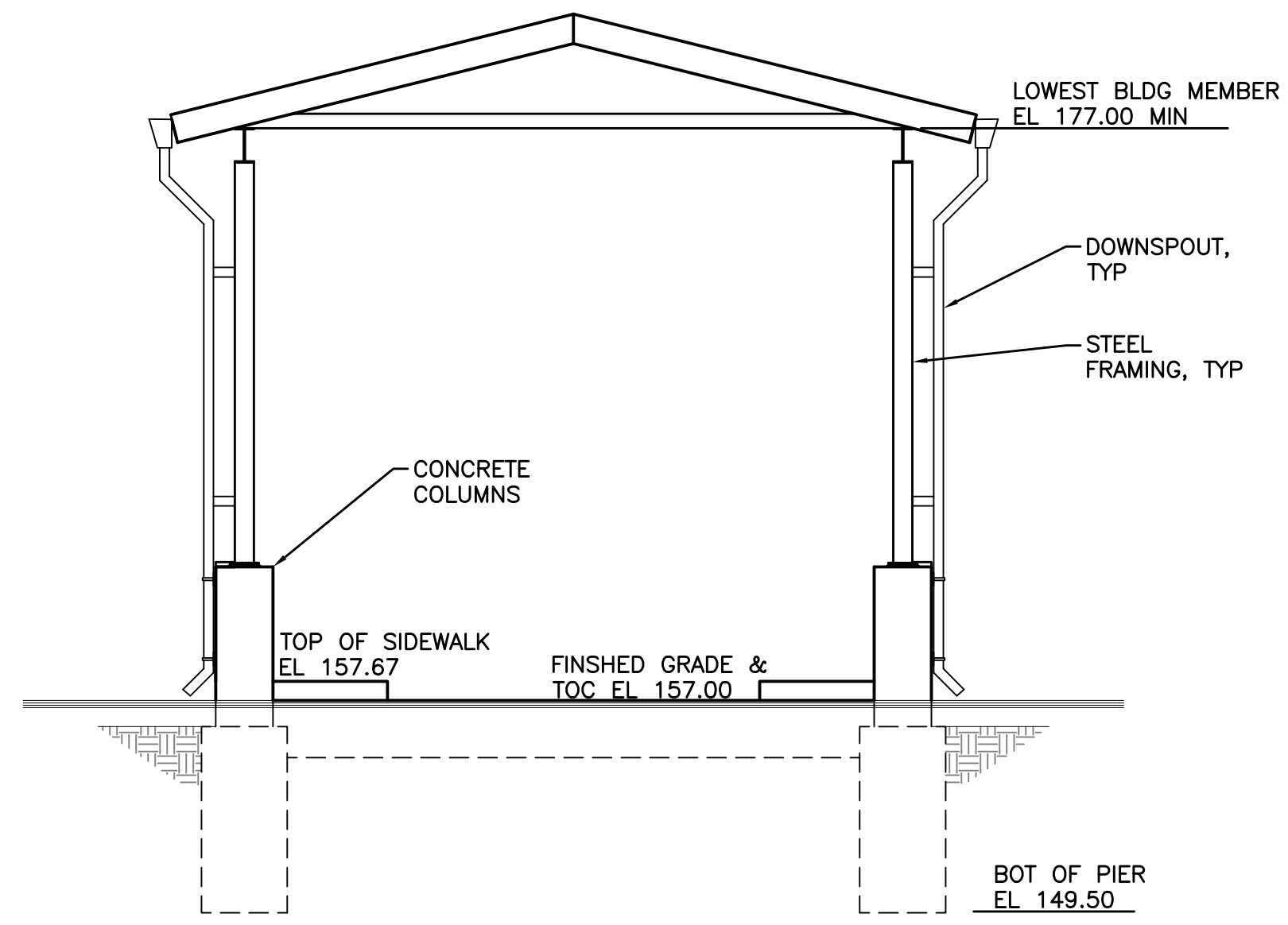


**MATERIAL STORAGE
SOUTH ELEVATION**
SCALE: 1/8"=1'-0"

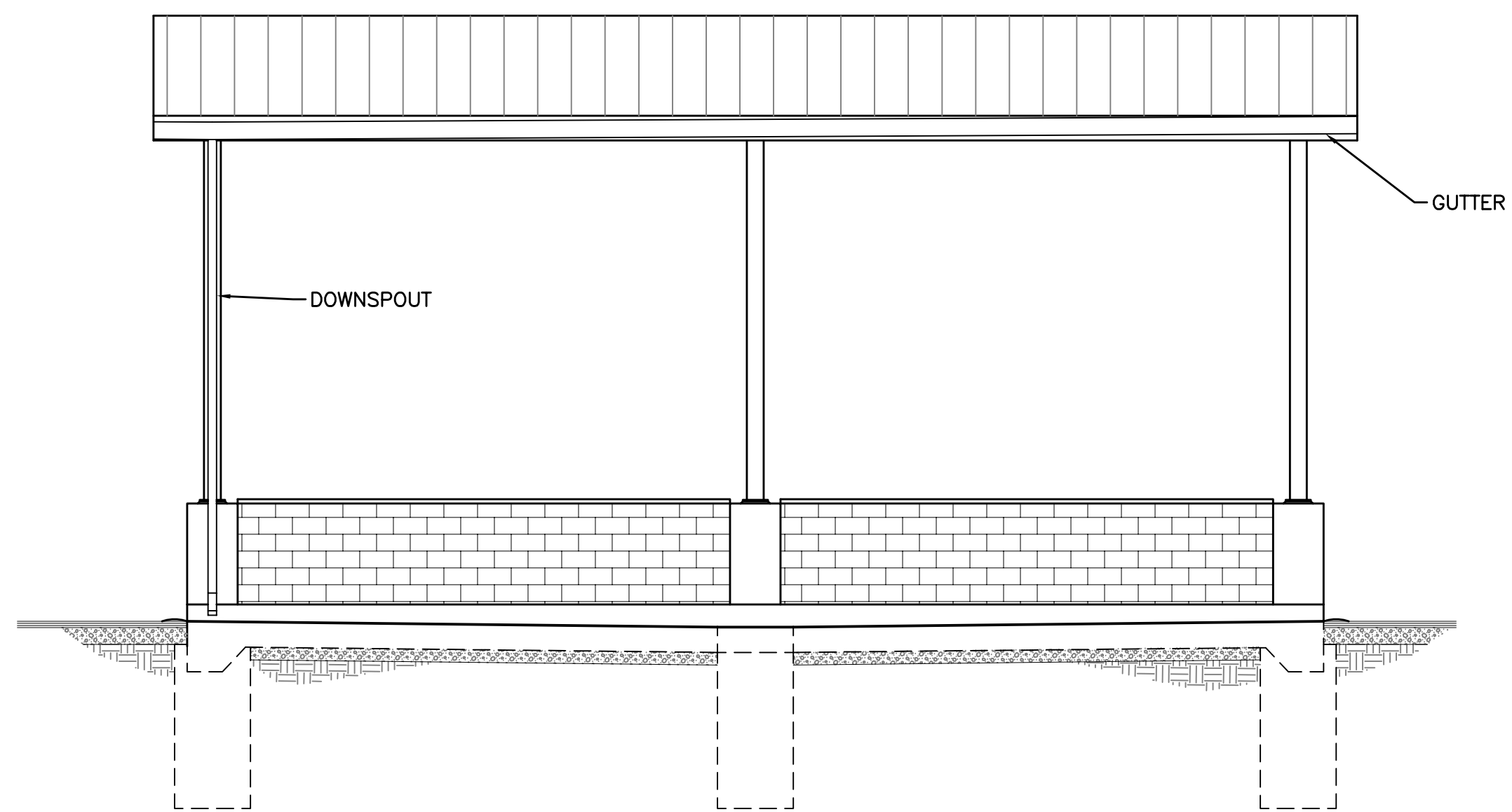
		SCALE: AS NOTED	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17	DOMENICHELLI & ASSOCIATES 1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762 Ph: (916) 933-1997 Fax: (916) 933-4778		BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29		CORPORATION YARD IMPROVEMENT PROJECT	DRAWING A1
DATE	DESCRIPTION				MATERIAL STORAGE ARCHITECTURAL ELEVATIONS			SHEET 13 of 28		



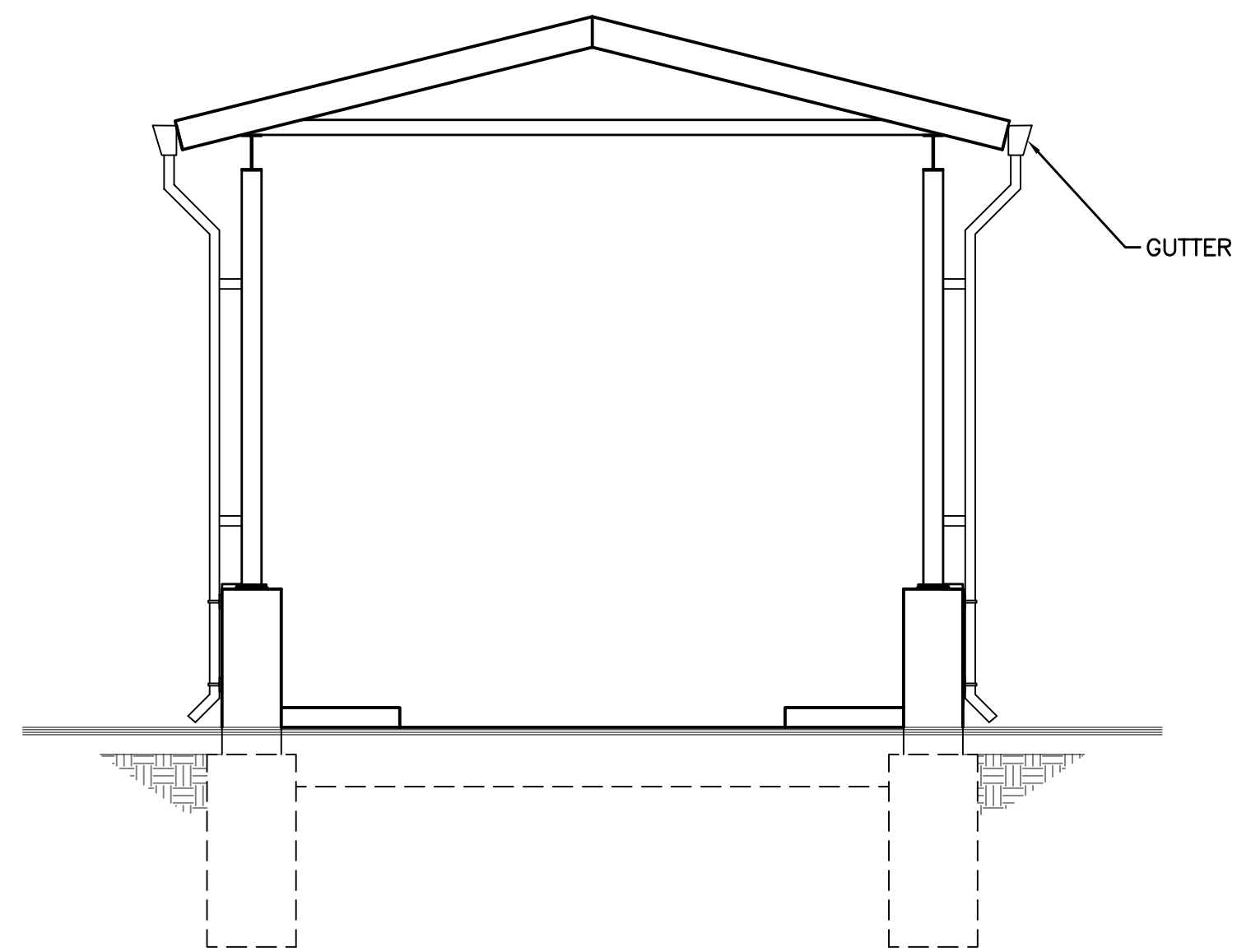
WASH STATION
EAST ELEVATION
SCALE: 3/16"=1'-0"



WASH STATION
NORTH ELEVATION
SCALE: 3/16"=1'-0"



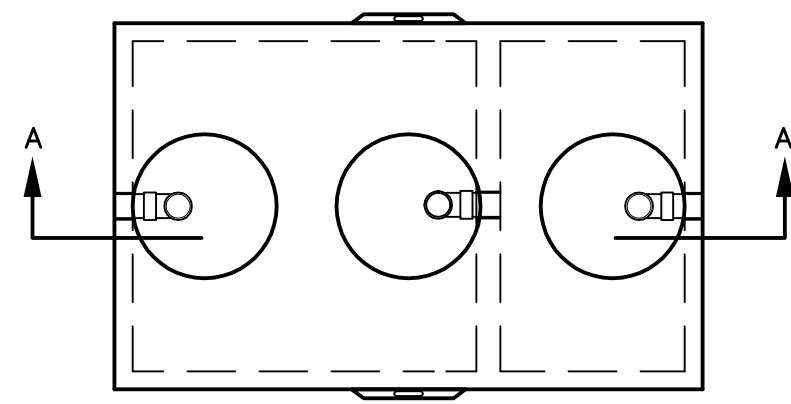
WASH STATION
WEST ELEVATION
SCALE: 3/16"=1'-0"



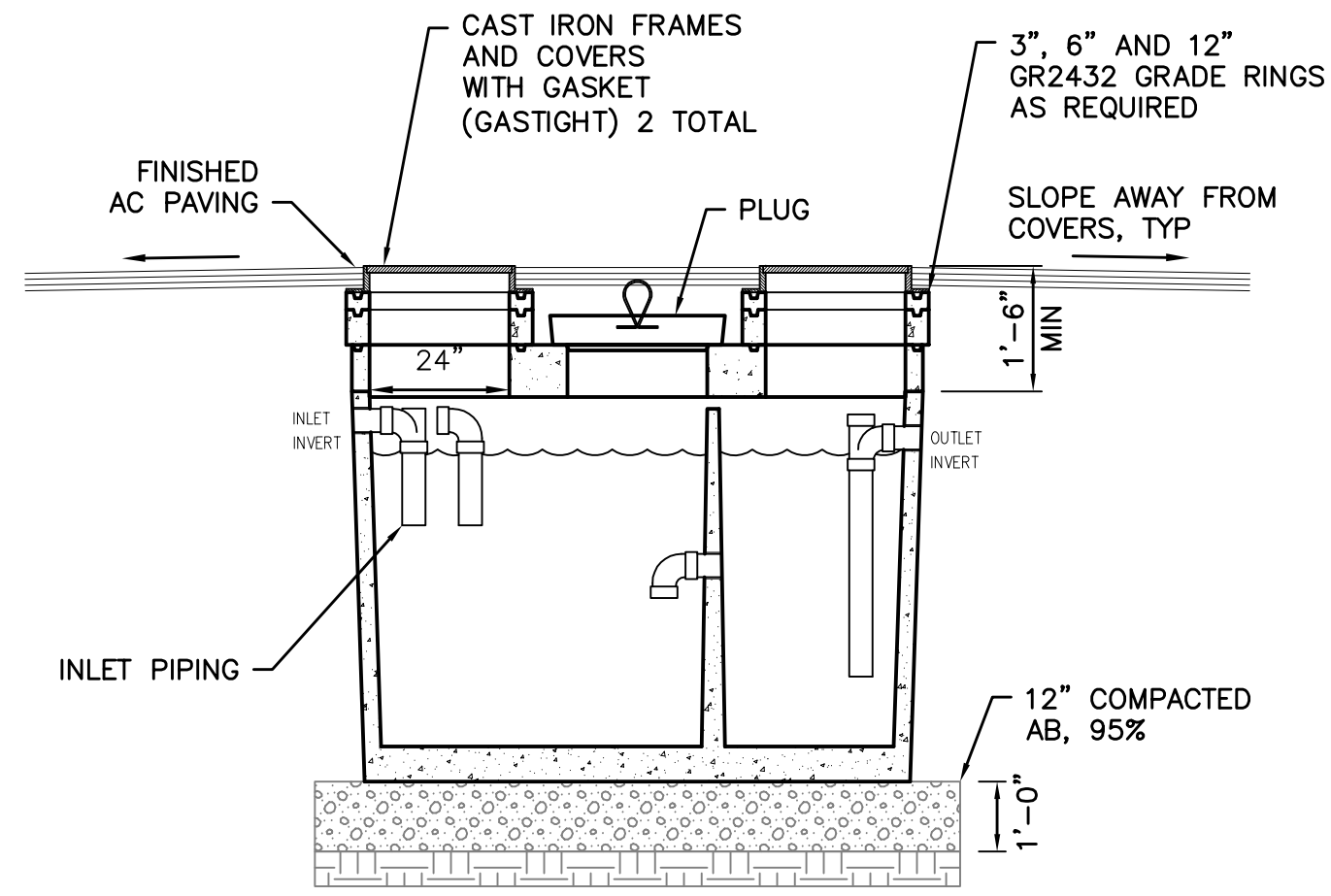
WASH STATION
SOUTH ELEVATION
SCALE: 3/16"=1'-0"

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DATE		DESCRIPTION		SCALE: AS NOTED	<p>WARNING</p> <p>0 1/2 1</p> <p>IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.</p>	<p>DESIGNED DARYL W. HEIGHER</p> <p>DRAWN JIM CADE</p> <p>CHECKED SARA ROGERS</p> <p>DATE 05/03/17</p>	<p>DOMENICHELLI & ASSOCIATES</p> <p>1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762</p> <p>Ph: (916) 933-1997 Fax: (916) 933-4778</p>		<p>BENCHMARK INFORMATION:</p> <p>A.P.N. 243-0180-005, 006, 007, 009, 011, 046</p> <p>BENCHMARK NO. 14-61 ELEV. 163.13</p> <p>7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29</p>	<p>6230 Sylvan Rd, Citrus Heights, CA 95610</p>	CORPORATION YARD IMPROVEMENT PROJECT		DRAWING A2
WASH STATION ARCHITECTURAL ELEVATIONS										SHEET 14	of 28		



PLAN VIEW W/ COVERS REMOVED

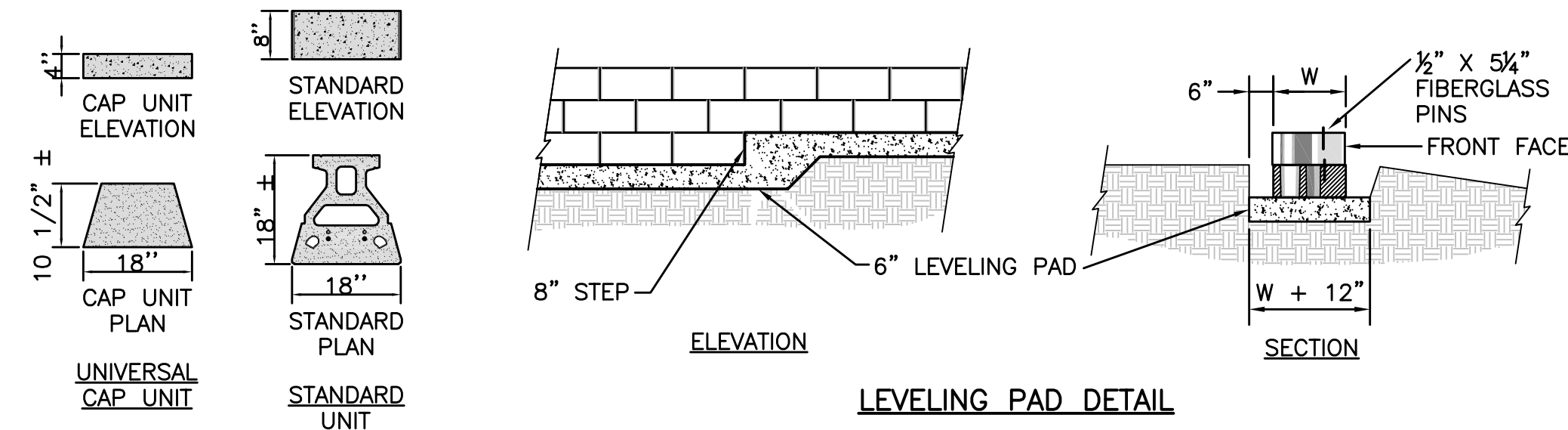
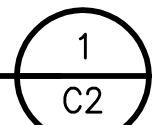


SECTION A-A

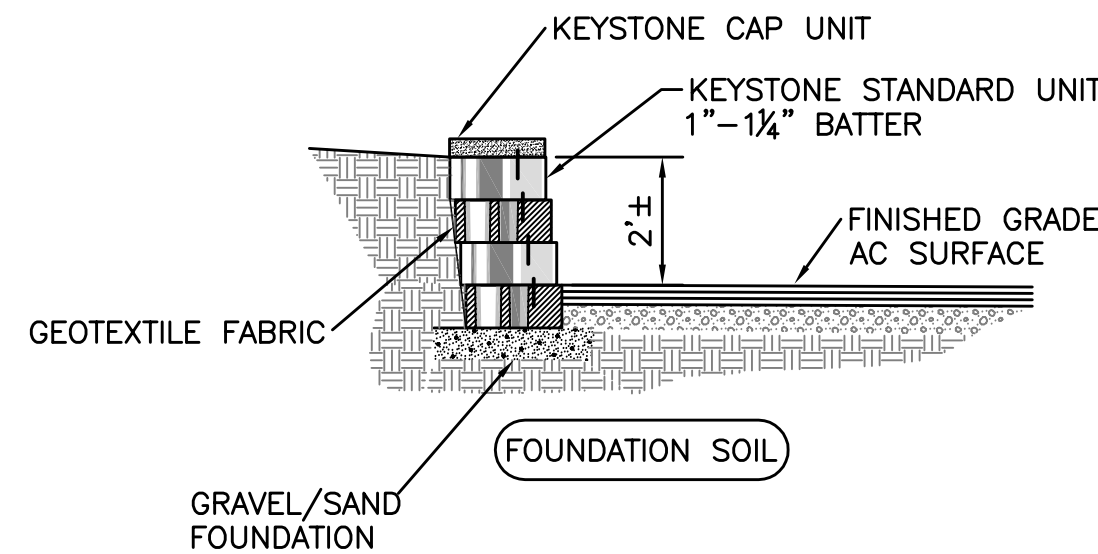
- NOTES:
- DESIGN LOAD: H-20 TRAFFIC WITH 1'-6" MINIMUM EARTH COVER.
 - DEPTH OF INVERT AND OUTLET PIPE ARE DEPENDENT ON DEPTH OF EXISTING SEWER AND STORM DRAIN PIPE. CONTRACTOR TO FIELD VERIFY DEPTH OF UTILITIES.
 - CONTRACTOR TO CONNECT TO INLET AND DISCHARGE PIPE WITH TRANSITION COUPLING.

SAND/OIL SEPARATOR PLAN

SCALE: 3/8"=1'-0"



LEVELING PAD DETAIL

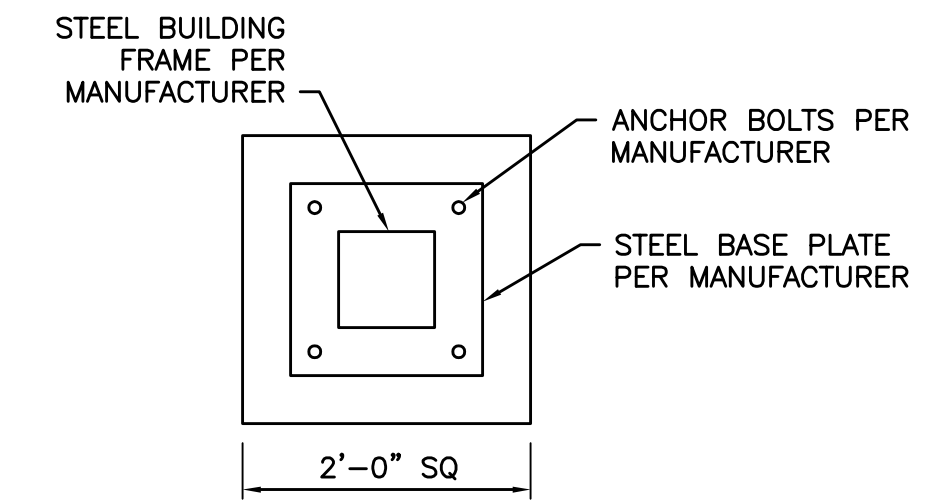
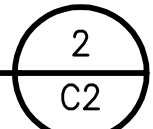


TYPICAL GRAVITY WALL SECTION
STANDARD UNIT - 1" SETBACK

- NOTE:
- CONTRACTOR TO DESIGN RETAINING WALLS.
 - BLOCKS SHALL BE SPLIT FACE. COLOR SHALL BE APPROVED BY THE DISTRICT PRIOR TO ORDERING. CONTRACTOR TO SUPPLY COLOR SAMPLES AND TEXTURES TO SELECT FROM.

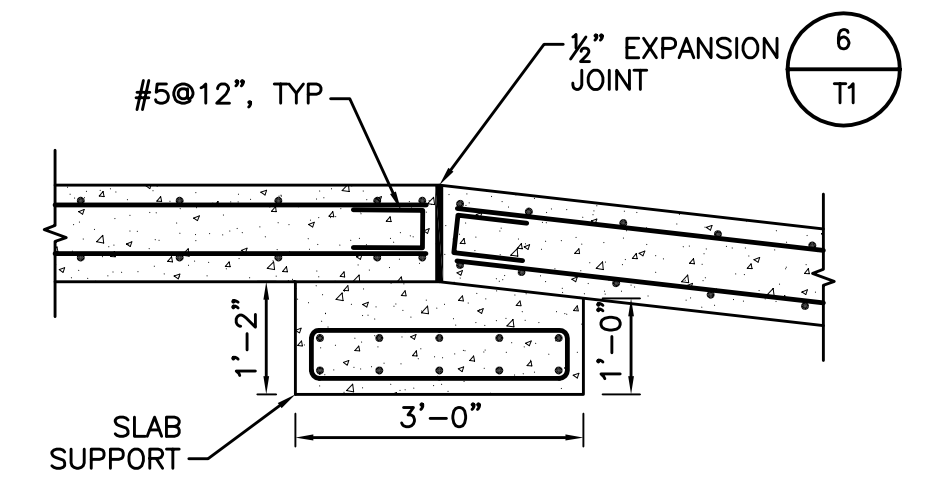
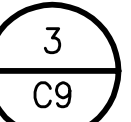
LANDSCAPE RETAINING WALL DETAIL

NTS



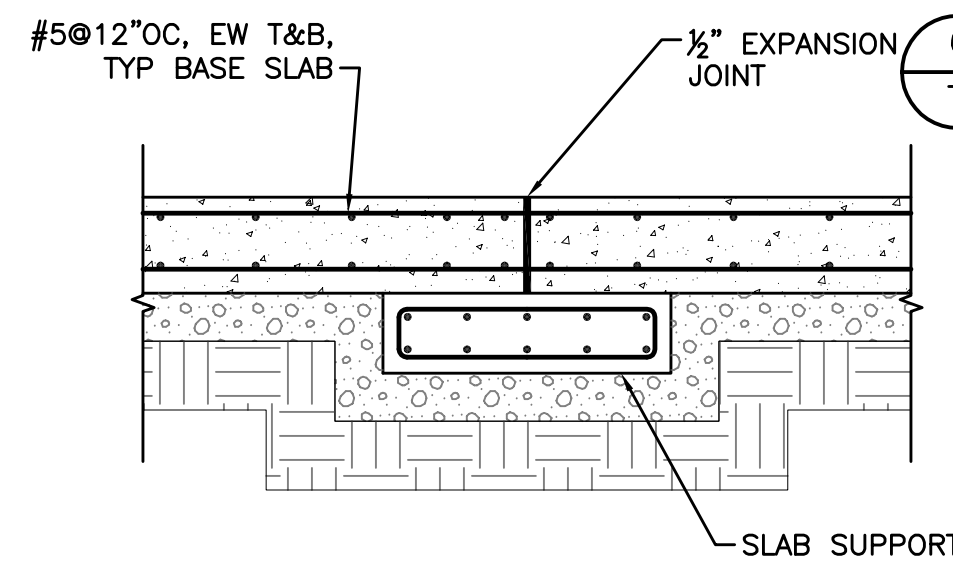
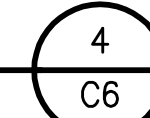
STEEL STRUCTURE DETAIL

SCALE: 3/4"=1'-0"



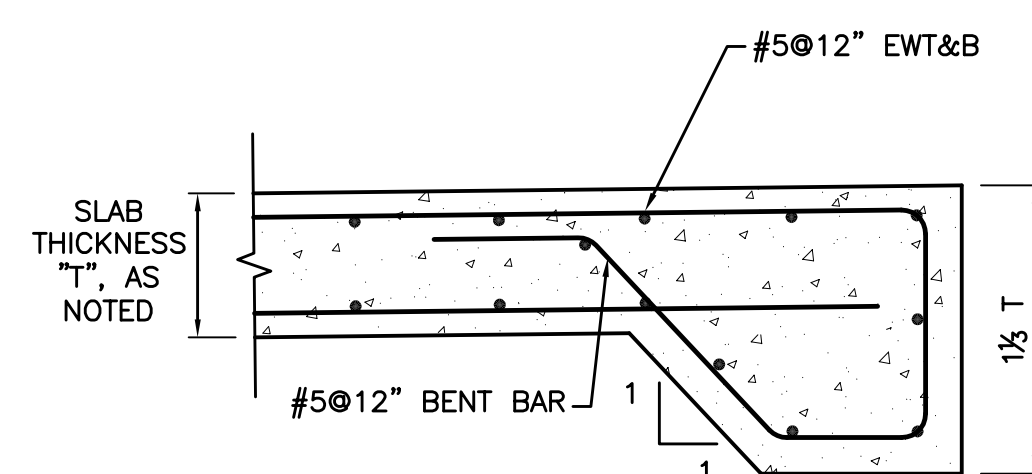
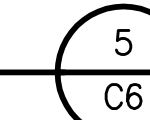
SLAB SUPPORT DETAIL

SCALE: 1/2"=1'-0"



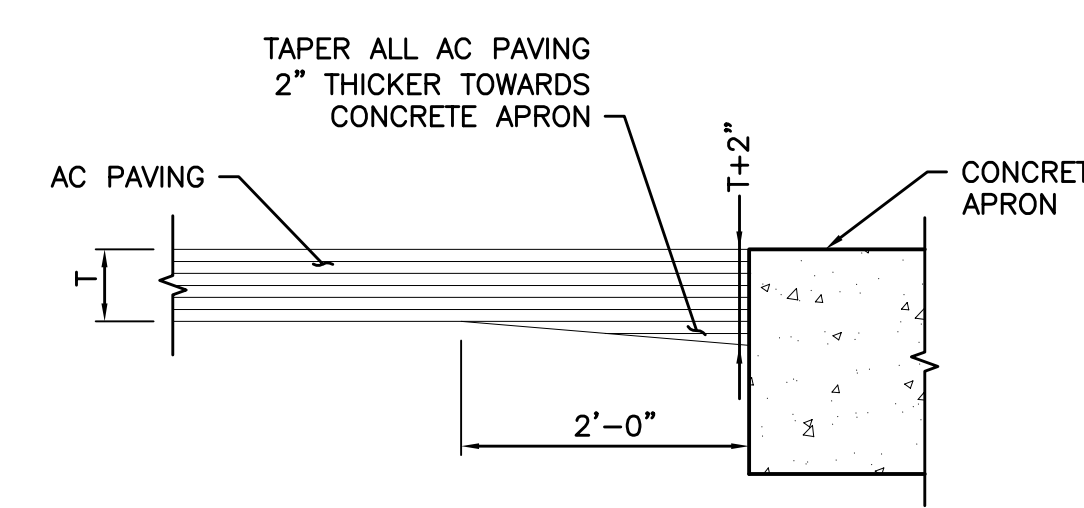
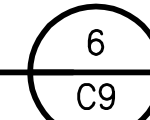
SLAB SUPPORT DETAIL

SCALE: 1/2"=1'-0"



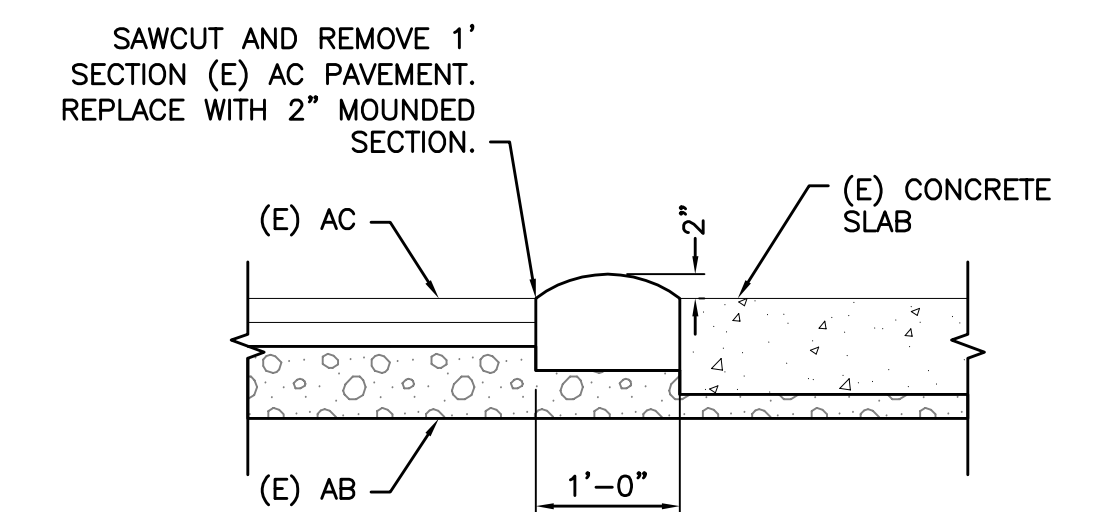
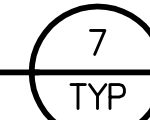
EDGE DETAIL

SCALE: 3/4"=1'-0"



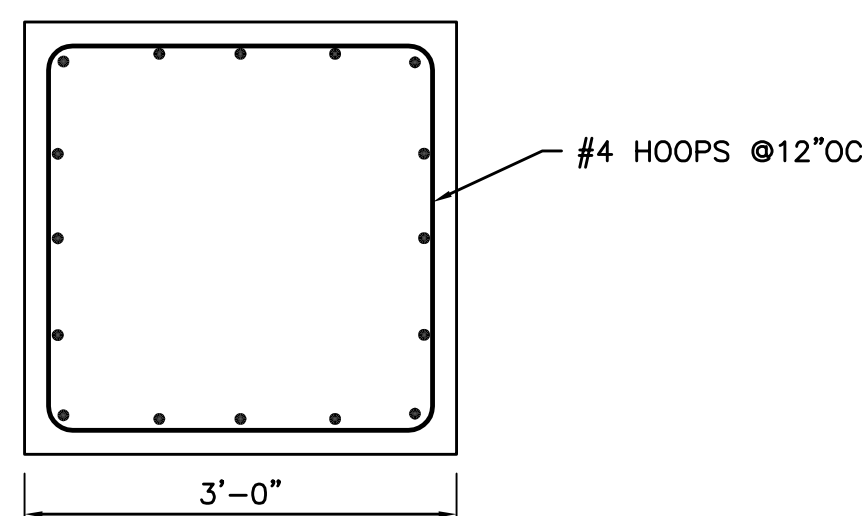
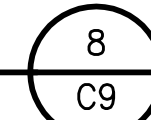
AC PAVEMENT TO CONCRETE TRANSITION DETAIL

SCALE: 3/4"=1'-0"



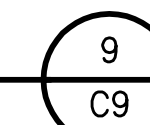
2" AC BERM DETAIL

SCALE: 3/4"=1'-0"



CONCRETE PIER DETAIL

SCALE: 3/4"=1'-0"



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DATE	DESCRIPTION

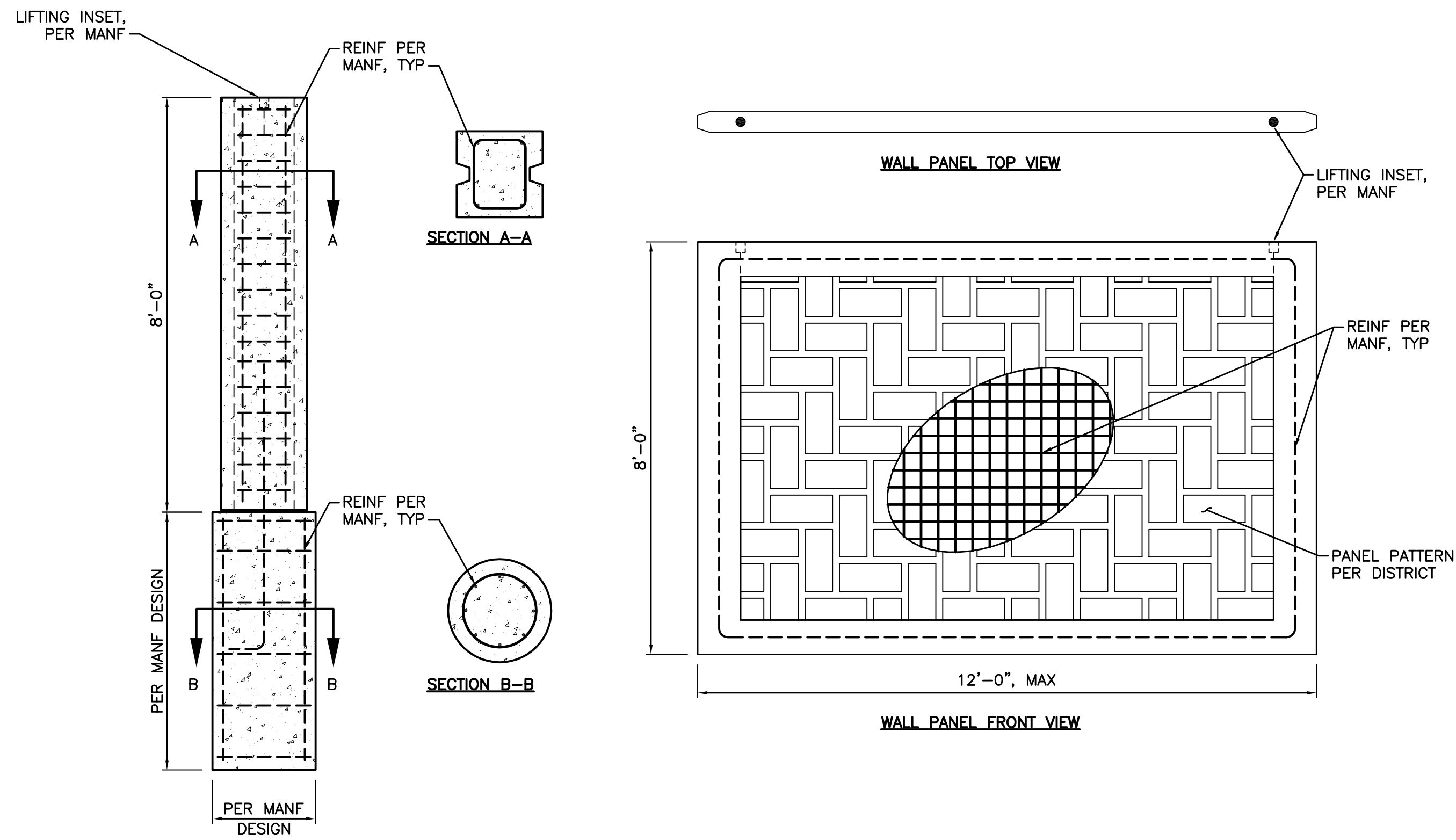
SCALE: AS NOTED	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DESIGNED DARYL W. HEIGHER DRAWN JIM CADE CHECKED SARA ROGERS DATE 05/03/17
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DOMENICHELLI & ASSOCIATES
 1101 Investment Blvd, Suite 115
 El Dorado Hills, CA 95762
 Ph: (916) 933-1997
 Fax: (916) 933-4778

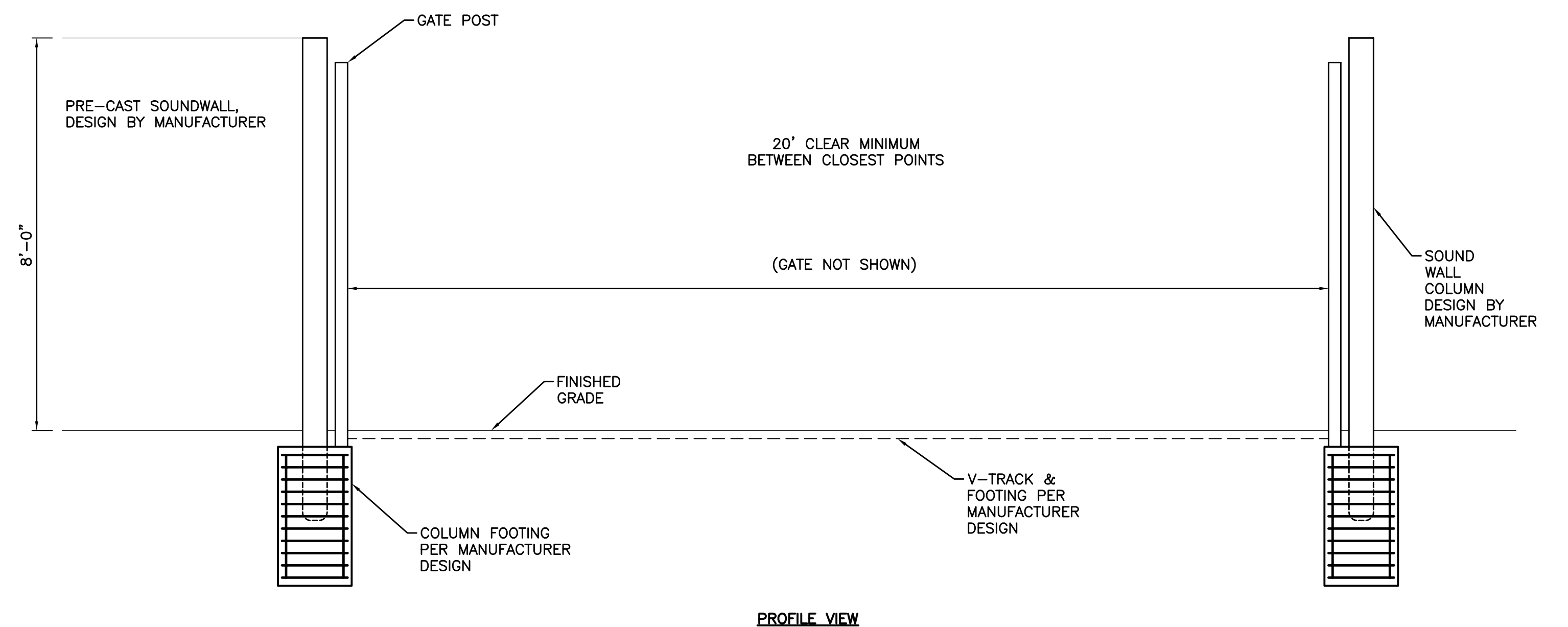
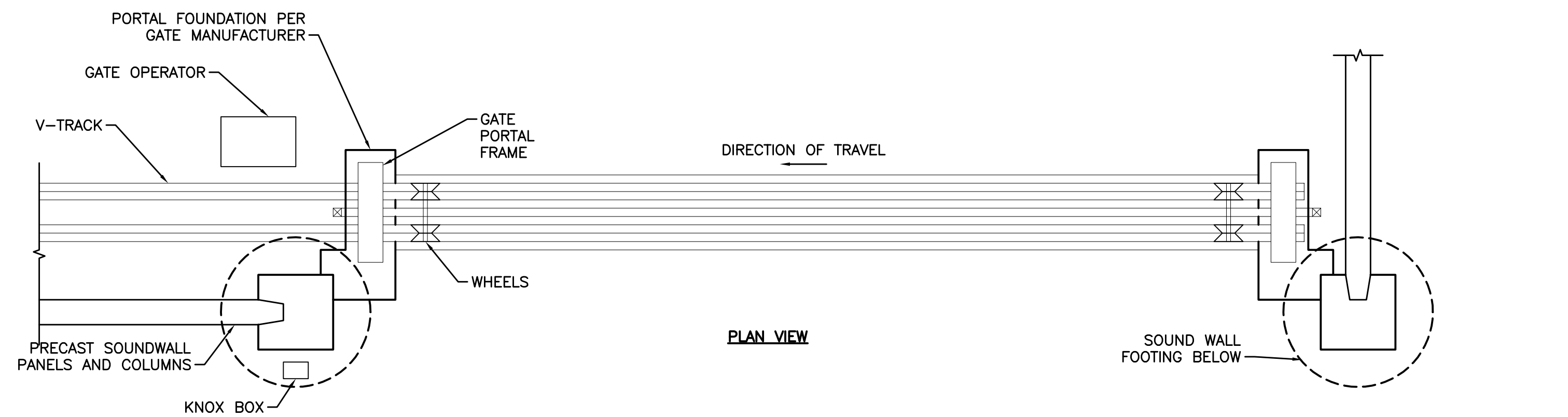
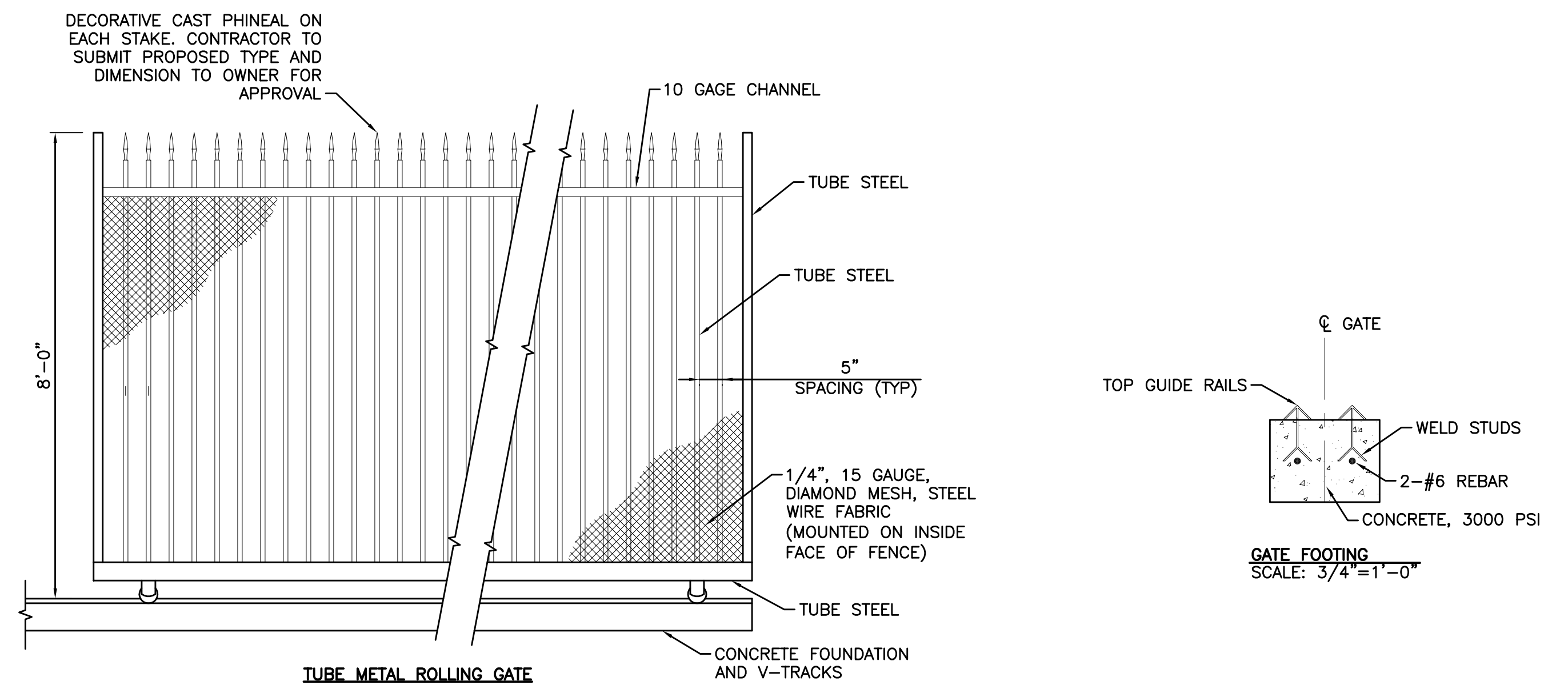
BENCHMARK INFORMATION:
 A.P.N. 243-0180-005, 006, 007, 009, 011, 046
 BENCHMARK NO. 14-61 ELEV. 163.13
 7/8" METAL DISC STAMPED "CO. B.M. 14-61"
 LOCATED IN CHISELED SQUARE IN TOP OF
 VERTICAL CURB ABOVE D.I. N END OF CURB
 RETURN AT THE NORTHWEST CORNER OF
 GREENBACK LANE & SYLVAN RD.
 VERTICAL DATUM - NAVD 29

CITRUS HEIGHTS WATER DISTRICT
 6230 Sylvan Rd, Citrus Heights, CA 95610

CORPORATION YARD IMPROVEMENT PROJECT		DRAWING D1	
DETAILS 1		SHEET 15	of 28



SOUNDWALL & COLUMN DETAIL 1
SCALE: 1/2"=1'-0" C2



ROLLING GATE/SOUNDWALL DETAIL 2
SCALE: 1/2"=1'-0" C2

I:\ASERVER\PROJECTS\PROJECT FILES\CHWD - CORP YARD\DWGS\CHWD001-DET 2.DWG

DATE	DESCRIPTION

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DOMENICHELLI & ASSOCIATES

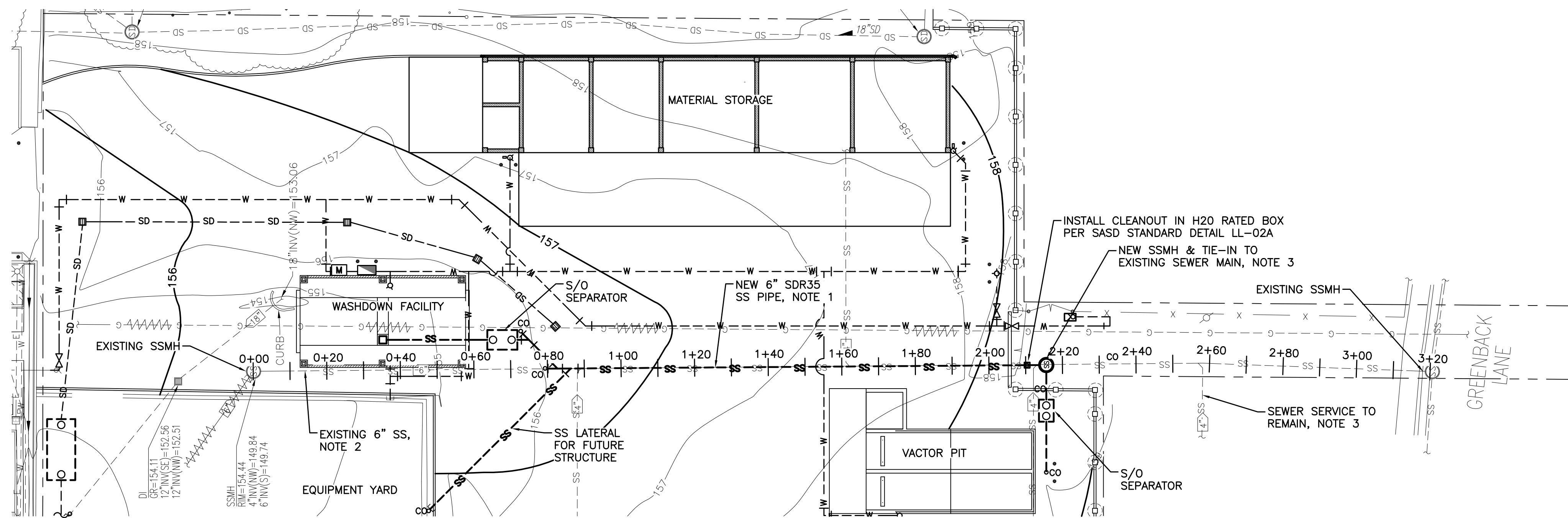
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El Dorado Hills, CA 95762
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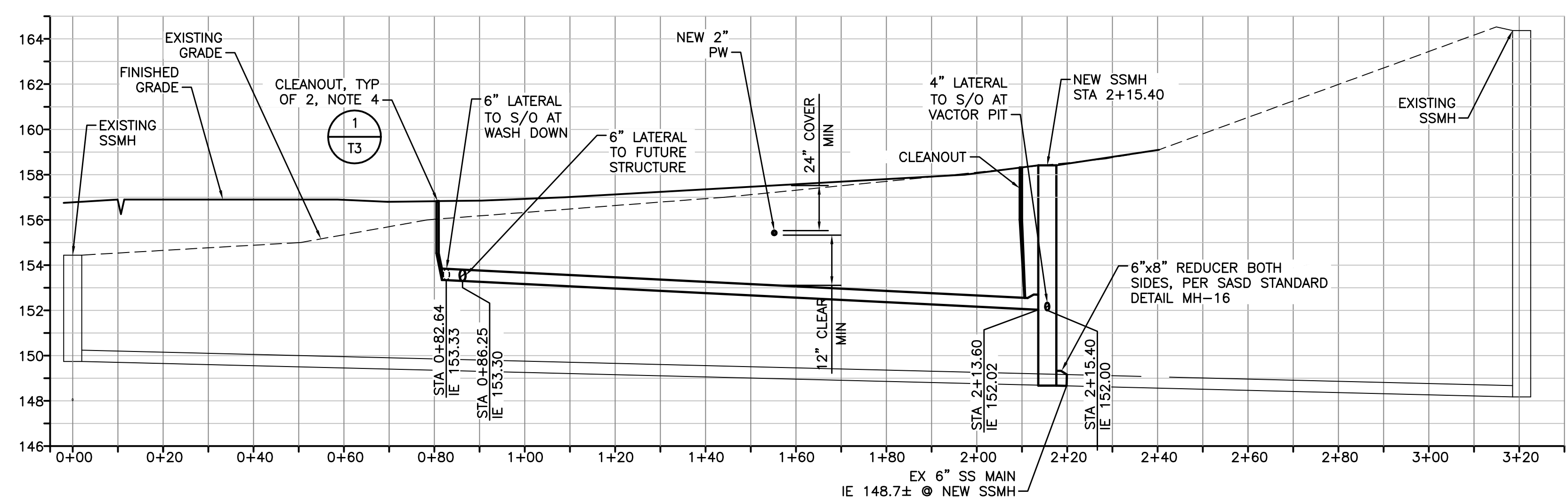
CORPORATION YARD IMPROVEMENT PROJECT	
DETAILS 2	
SHEET 16	DRAWING D2 of 28



PLAN
SCALE: 1" = 20'

NOTES:

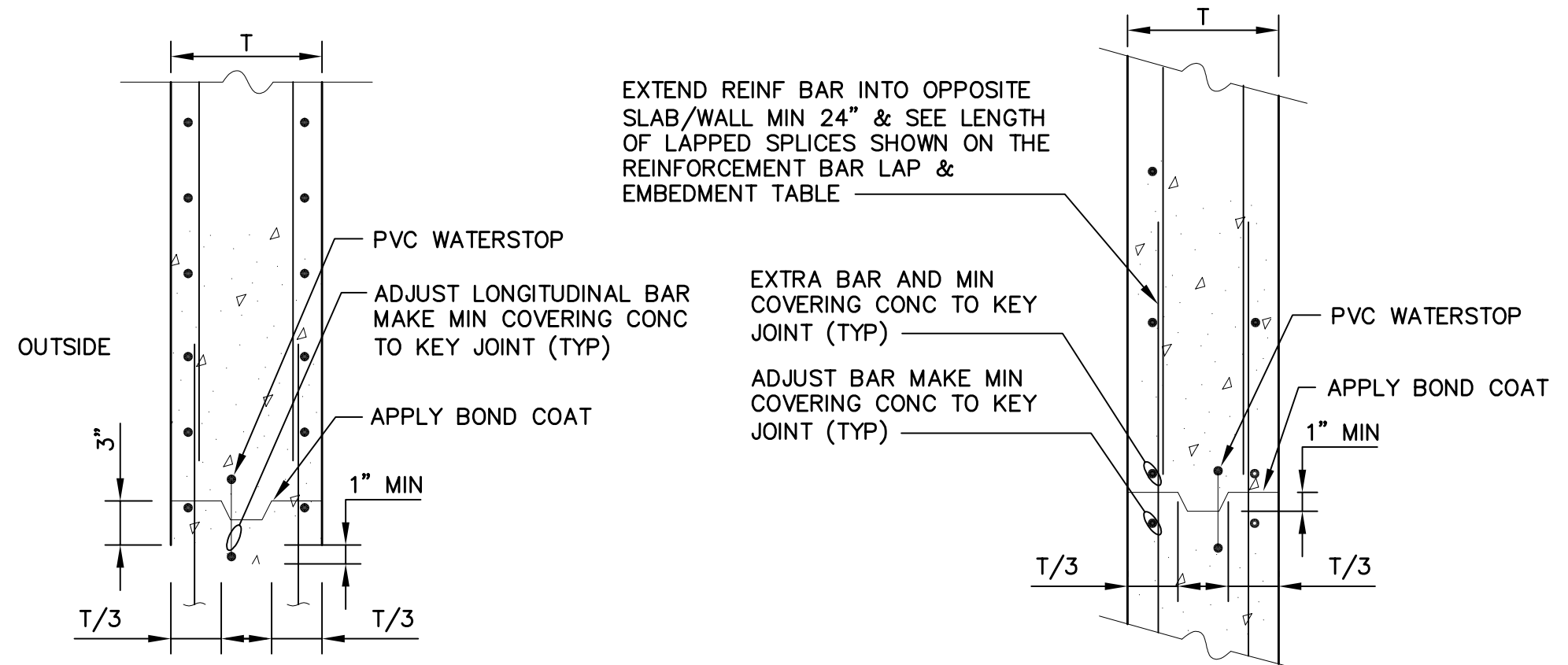
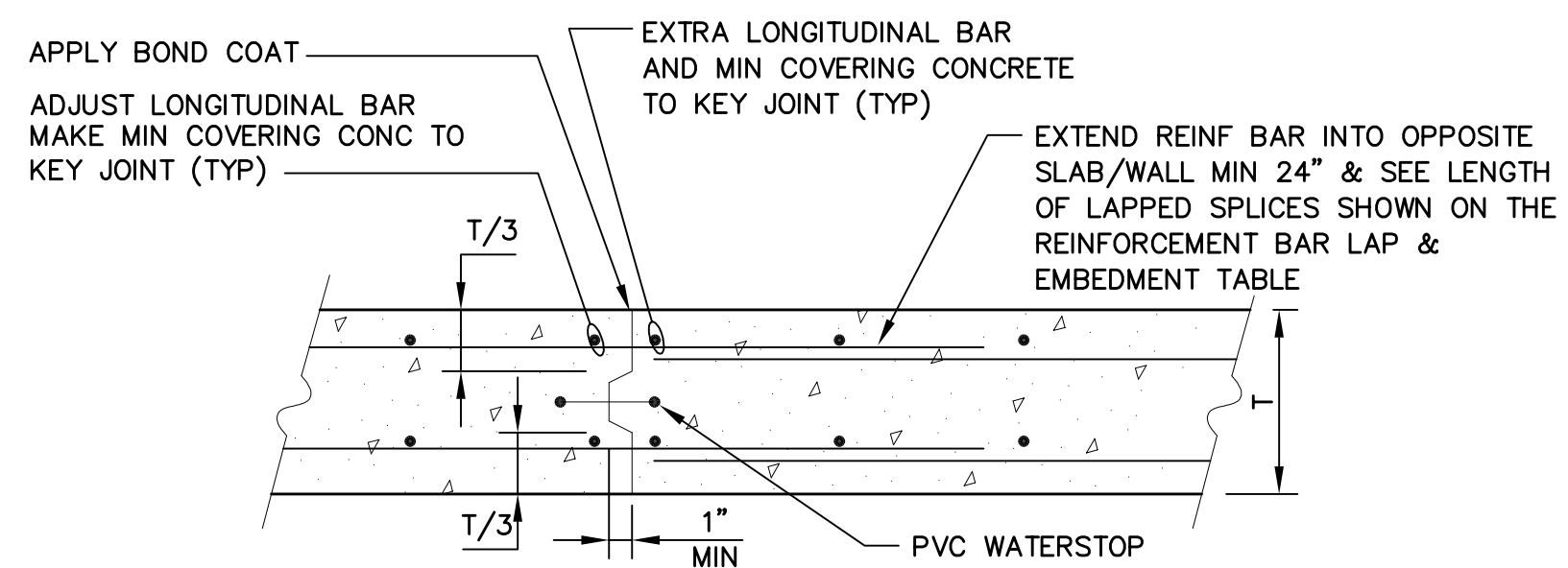
1. THE NEW SANITARY SEWER SHALL BE LOCATED IN THE SAME TRENCH AS THE EXISTING SANITARY SEWER, BUT AT HIGHER ELEVATION. SEE PROFILE ON THIS DRAWING.
2. SEE DRAWING C1 FOR DEMOLITION/ABANDONMENT OF EXISTING 6-INCH SANITARY SEWER.
3. NEW SEWER MANHOLE AND CONNECTION TO EXISTING SEWERLINE SHALL BE CONSTRUCTED PER SASD STANDARDS. CONSTRUCTION AND INSPECTION SHALL BE COORDINATED WITH SASD FOR APPROVALS. CONTRACTOR SHALL ENSURE THAT THE 4-INCH SERVICE FOR THE PROPERTY TO THE SOUTH REMAINS IN SERVICE AT ALL TIMES DURING CONSTRUCTION. SEE SASD STANDARD DETAIL MH-03 AND MH-16.
4. SEE DRAWING C4 FOR ALL CLEANOUT LOCATIONS ON THE NEW SEWER SYSTEM.



PROFILE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

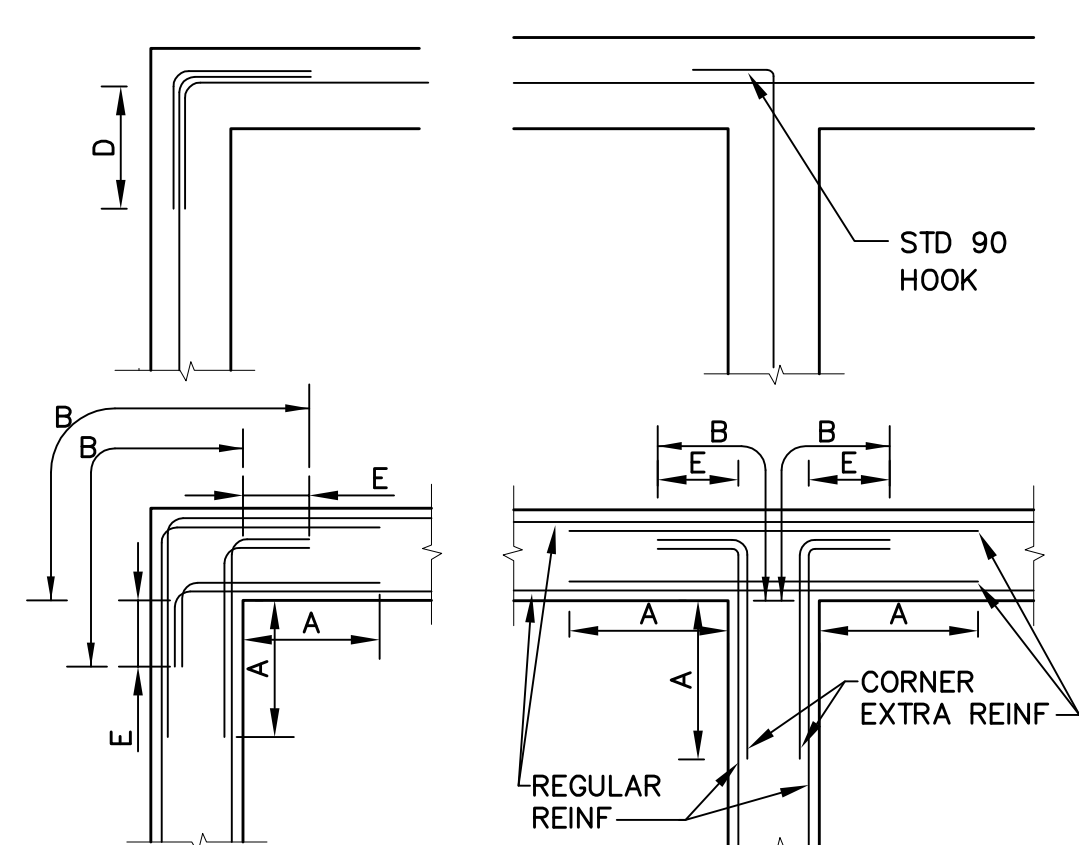
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DATE	DESCRIPTION	SCALE:	WARNING	DESIGNED DARYL W. HEIGHER	DOMENICHELLI & ASSOCIATES	BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD. VERTICAL DATUM - NAVD 29		CORPORATION YARD IMPROVEMENT PROJECT	DRAWING D3
		AS NOTED	 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DRAWN JIM CADE				1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762	



- NOTES:
1. LOCATE PER PLANS.
 2. UTILIZE WATERSTOP WHERE IDENTIFIED ON PLANS.

TYPICAL CONCRETE CONSTRUCTION JOINTS
NTS

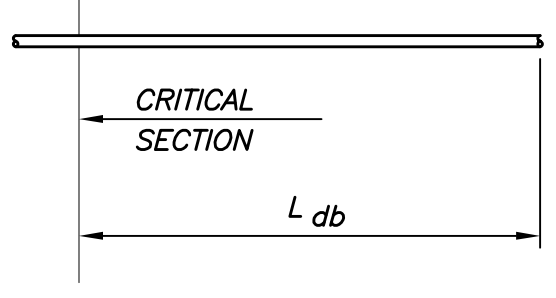


- NOTES:
1. "A" IS 1/5 THE CLEAR SPAN DISTANCE MEASURED HORIZ OR VERT, WHICHEVER IS THE SMALLER; BUT IN NO CASE LESS THEN THE REQ'D LENGTH OF LAPPED SPLICES FOR TOP BARS AS SHOWN ON THE REINF BAR LAP & EMBEDMENT TABLE.
 2. "B" IS SUFFICIENT LENGTH TO PERMIT BARS TO EXTEND THROUGH WALL TO OPPOSITE FACE AND TERMINATE IN A STANDARD HOOK BUT SHALL NOT BE LESS THAN THE LENGTH REQ'D FOR EMBEDMENT OF TOP BAR, AS SHOWN ON THE REINF BAR LAP & EMBEDMENT TABLE.
 3. "D" NOT LESS THAN THE REQ'D FOR LAPPED SPLICES FOR TOP BARS AS SHOWN ON THE REINF BAR LAP & EMBEDMENT TABLE.
 4. "E" IS NOT LESS THAN THE STD HOOK.
 5. EXTRA BARS ALTERNATING WITH AND SAME AS HORIZ STEEL.
 6. THIS DETAIL SHOWS THE HORIZ BARS ONLY.

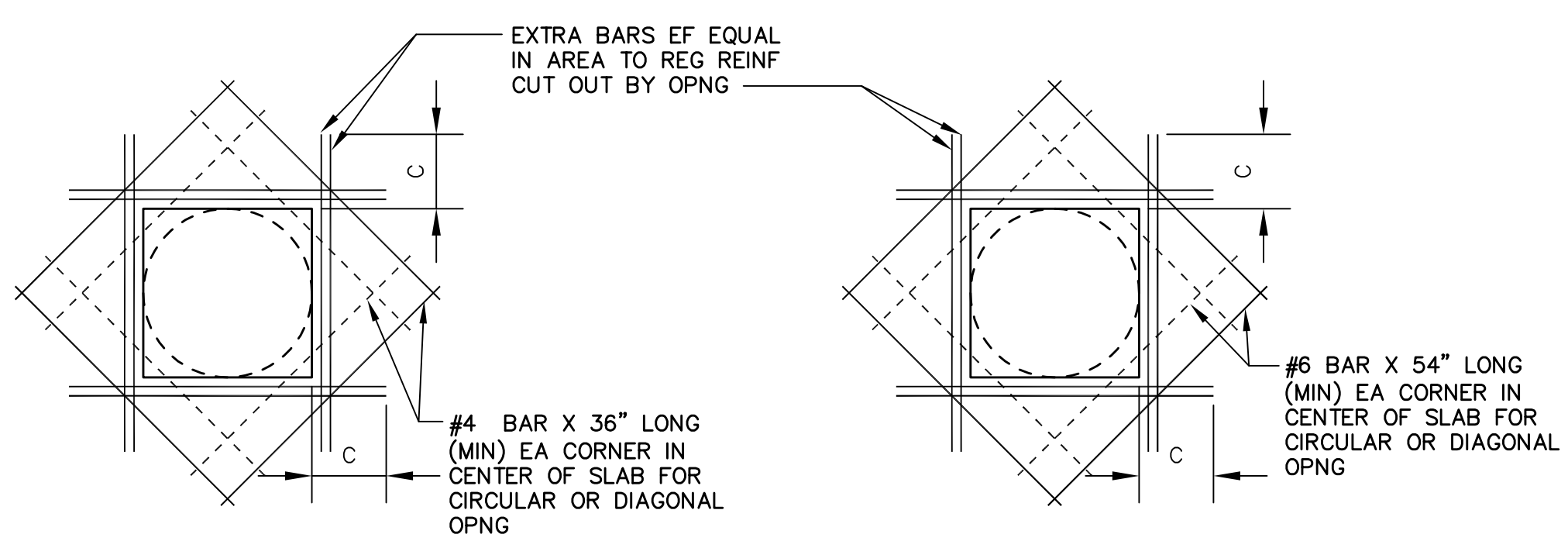
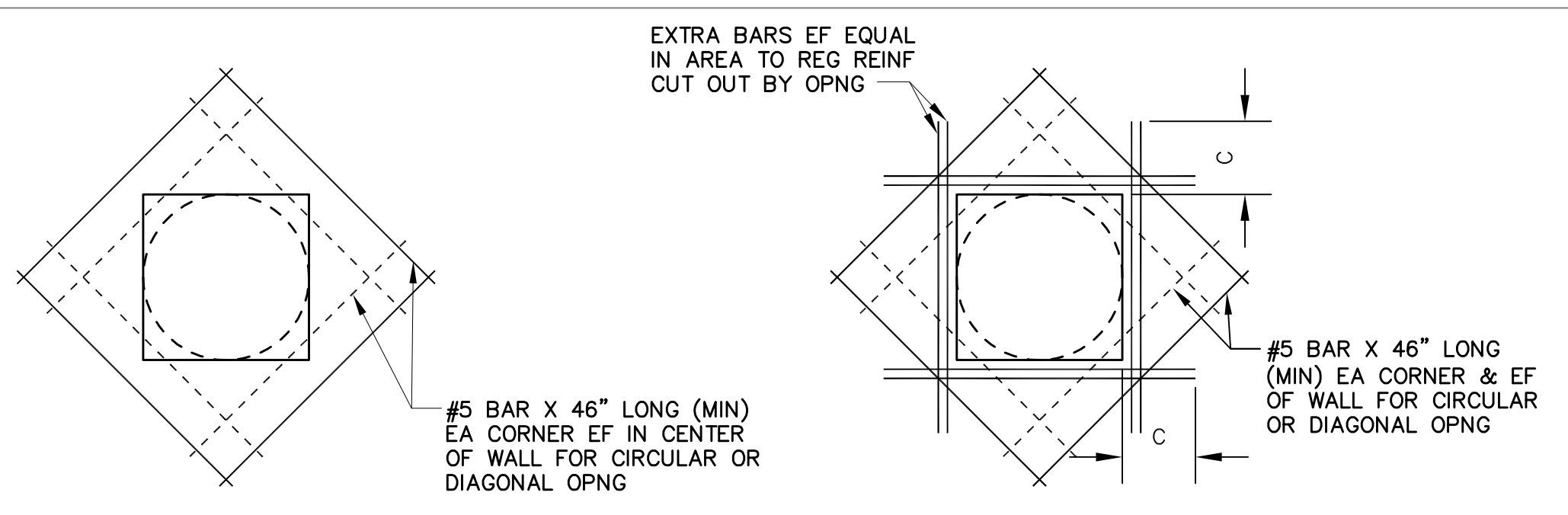
TYPICAL CORNER REINFORCING DETAILS
NTS

BAR SIZE	TENSION EMBEDMENT LENGTH L_{db} (INCHES)		LAP SPlice LENGTH (INCHES)	
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
#3	22	14	29	19
#4	29	19	38	25
#5	36	24	47	32
#6	43	29	56	38
#7	63	42	82	55
#8	72	48	94	63
#9	80	54	104	70
#10	90	60	117	78

$f'_c = 4,000$ psi
NORMAL WEIGHT CONCRETE



LAP SPlice AND TENSION EMBEDMENT LENGTHS
NTS



TYPICAL EXTRA REINFORCING AT ALL OPENINGS
NTS

- NOTES:
1. THE SLAB OPNG DETAILS APPLY TO OPENING LARGER THAN 12" IN DIAM OR DIAGONAL
 2. --- DIAGONAL OPNG EXTRA REINF BAR
- - - CIRCULAR OPNG EXTRA REINF BAR
 3. C = THE REQ'D LENGTH FOR LAPPED SPlice FOR TOP BARS AS SHOWN ON REINF BAR LAP & EMBEDMENT DETAIL TABLE

FOOTNOTES:

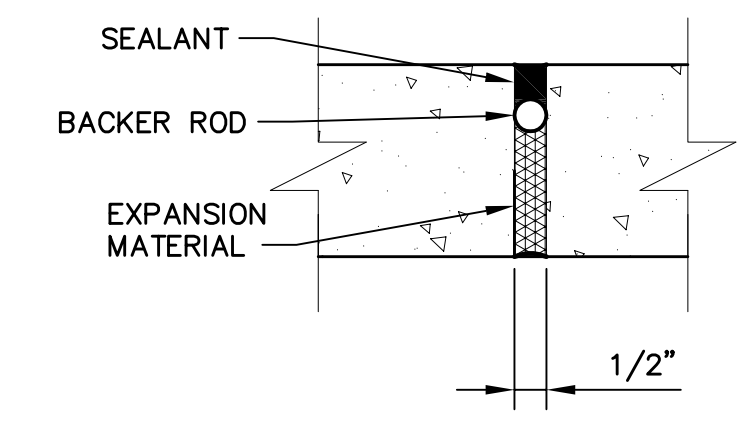
1. TOP BARS ARE HORIZONTAL BARS SO THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.
2. UNLESS OTHERWISE NOTED ON THE DRAWINGS, LAP SPlice LENGTHS, AND TENSION EMBEDMENT LENGTHS SHALL BE NO LESS THAN (NO MINUS TOLERANCE) SHOWN.
3. LAP SPlices SHALL NOT BE MADE AT POINTS OF MAXIMUM STRESS AS DETERMINED BY THE ENGINEER AND SHALL NOT BE SPACED CLOSER THAN 6" OC.
4. IF THE CLEAR SPACING BETWEEN BARS < $2d_b$ OR CONCRETE COVER < d_b THE TENSION EMBEDMENT AND LAP SPlice LENGTHS MUST BE INCREASED BY 50 PERCENT.
5. TENSION EMBEDMENT LENGTH L_d IS THE STRAIGHT LENGTH OF REINFORCING BAR THAT MUST BE EMBEDDED IN THE CONCRETE BEYOND THE CRITICAL SECTION FOR A STRAIGHT DOWEL TO BE SUBSTITUTED FOR A STANDARD END HOOK.
6. CONCRETE COMPRESSIVE STRENGTH ADJUSTMENTS
 - 6.1. THE TENSION EMBEDMENT AND LAP SPlice LENGTHS SHOWN ARE FOR NORMAL WEIGHT CONCRETE WITH $f'_c=4,000$ psi.
 - 6.2. FOR LIGHT WEIGHT CONCRETE WITH $f'_c=3,000$ psi, INCREASE THE LENGTHS SHOWN BY 20%.
 - 6.3. FOR NORMAL WEIGHT CONCRETE WITH $f'_c=5,000$ psi, DECREASE THE LENGTHS SHOWN BY 10%.
7. FOR BAR SPACING OF 6" OR LESS, INCREASE VALUES SHOWN BY 33%.

LOCATION

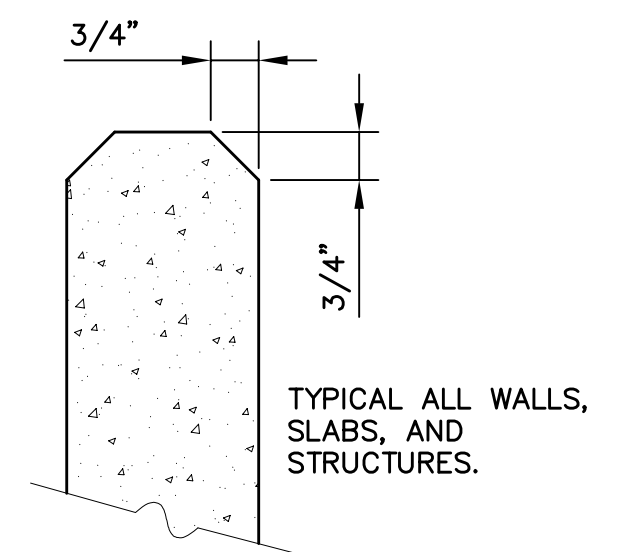
- CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
- EXPOSED TO WEATHER, EARTH, OR SUBMERGED
NO 5 BARS AND SMALLER 2"
NO 6 THROUGH NO 18 BARS 2"
- NOT EXPOSED TO WEATHER, EARTH, OR SUBMERGED
NO 11 BARS AND SMALLER 3/4"
NO 14 AND NO 18 BARS 1 1/2"
- ALL CONCRETE SHALL BE REINFORCED, MINIMUM #5@12", EWEF, UNO

*COVER FOR REINFORCING STEEL SHALL NOT BE LESS THAN THE MINIMUM GIVEN ABOVE (NO MINUS TOLERANCE), AND SHALL NOT EXCEED THE MINIMUM BY MORE THAN 1/4 INCH WHERE THE CONCRETE THICKNESS IS 24" OR LESS, OR MORE THAN 1/2 INCH WHERE THE CONCRETE THICKNESS IS MORE THAN 24 INCHES.

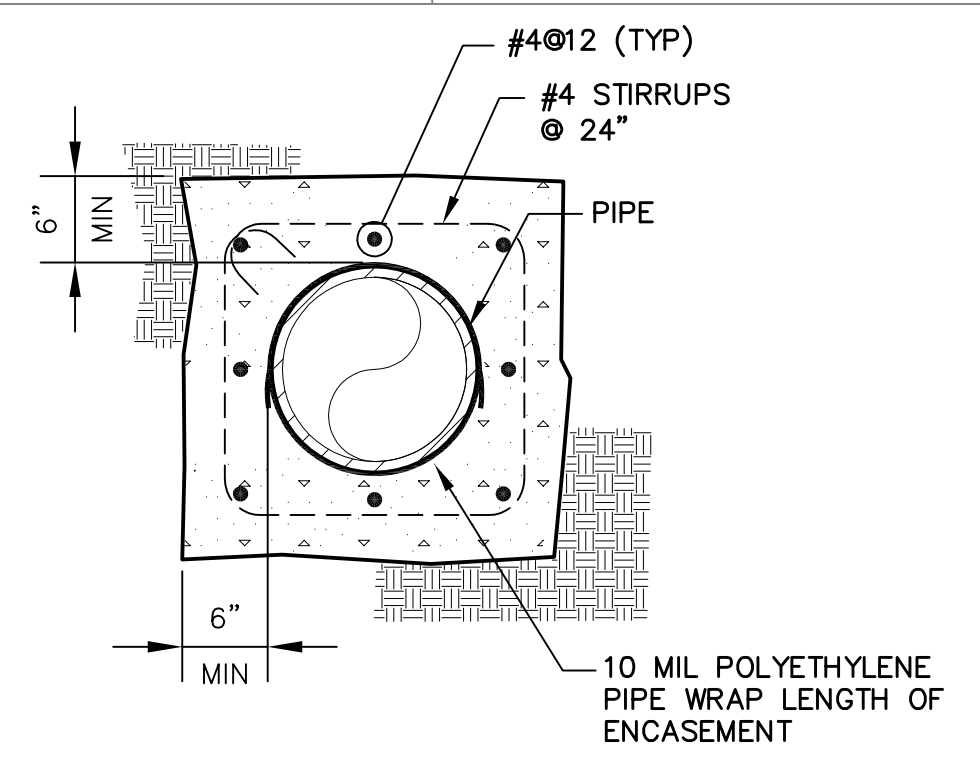
CONCRETE COVER FOR REINFORCEMENT
NTS



EXPANSION JOINT DETAIL
NTS



CONCRETE CHAMFER DETAIL
NTS



- NOTES:
1. PVC PIPE, TAPE ON #10 INSULATED COPPER LOCATOR WIRE TO TOP OF PIPE.

ENCASEMENT DETAIL
NTS

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SCALE:	WARNING 0 1/2 1
NONE	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.
DESIGNED DARYL W. HEIGHER	
DRAWN JIM CADE	
CHECKED SARA ROGERS	
DATE 05/03/17	
DATE	DESCRIPTION

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DRAWN JIM CADE	
CHECKED SARA ROGERS	
DATE 05/03/17	

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VERTICAL DATUM - NAVD 29

CITRUS HEIGHTS WATER DISTRICT

6230 Sylvan Rd, Citrus Heights, CA 95610

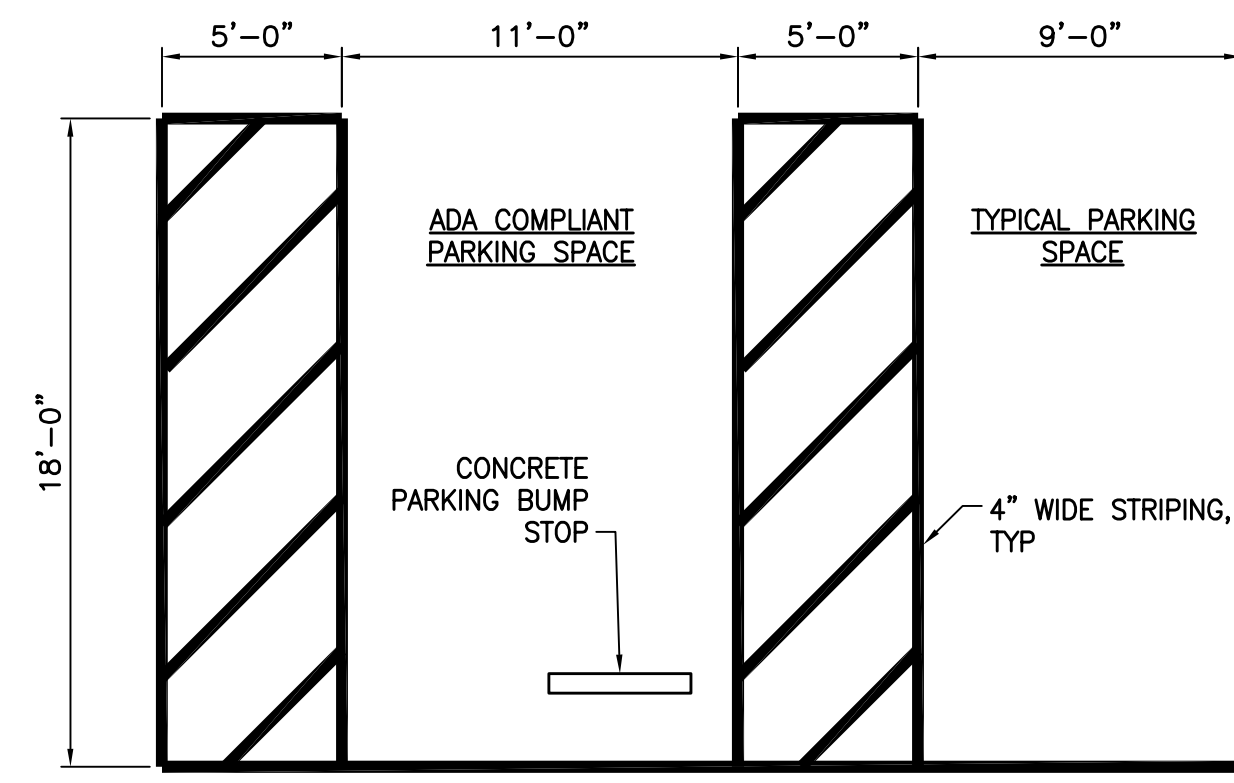
CORPORATION YARD IMPROVEMENT PROJECT

TYPICAL DETAILS 1

SHEET 18 of 28

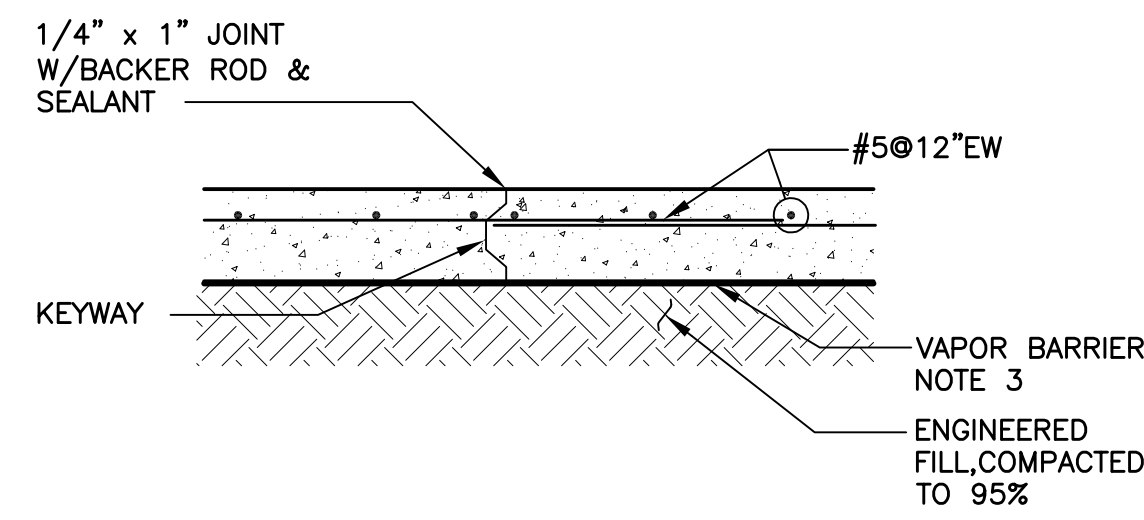
DRAWING T1

SHEET 18 of 28



PARKING SPACE DETAIL
NTS

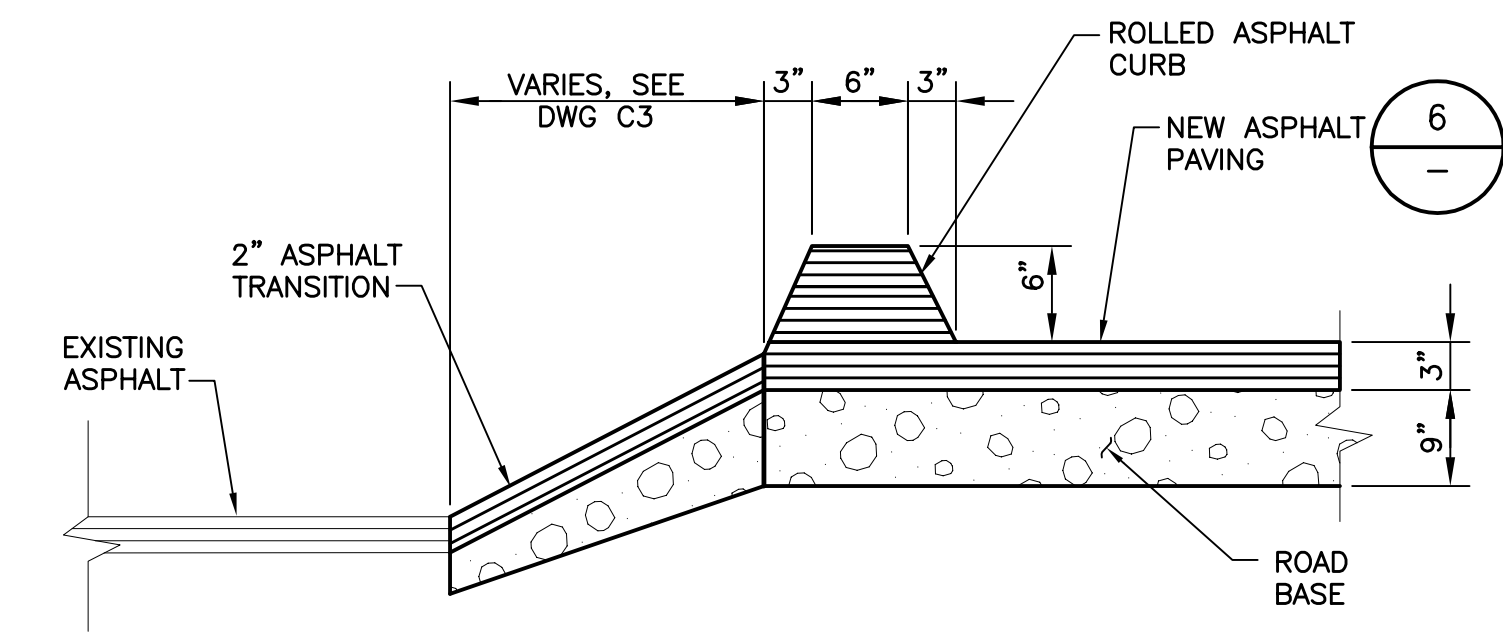
1
TYP



- NOTE:**
- POUR ALL FLOORS IN A CHECKERBOARD PATTERN.
 - 7 DAYS MINIMUM BETWEEN ADJACENT POURS.
 - INSTALL VAPOR BARRIER AT BUILDING SLAB ONLY.

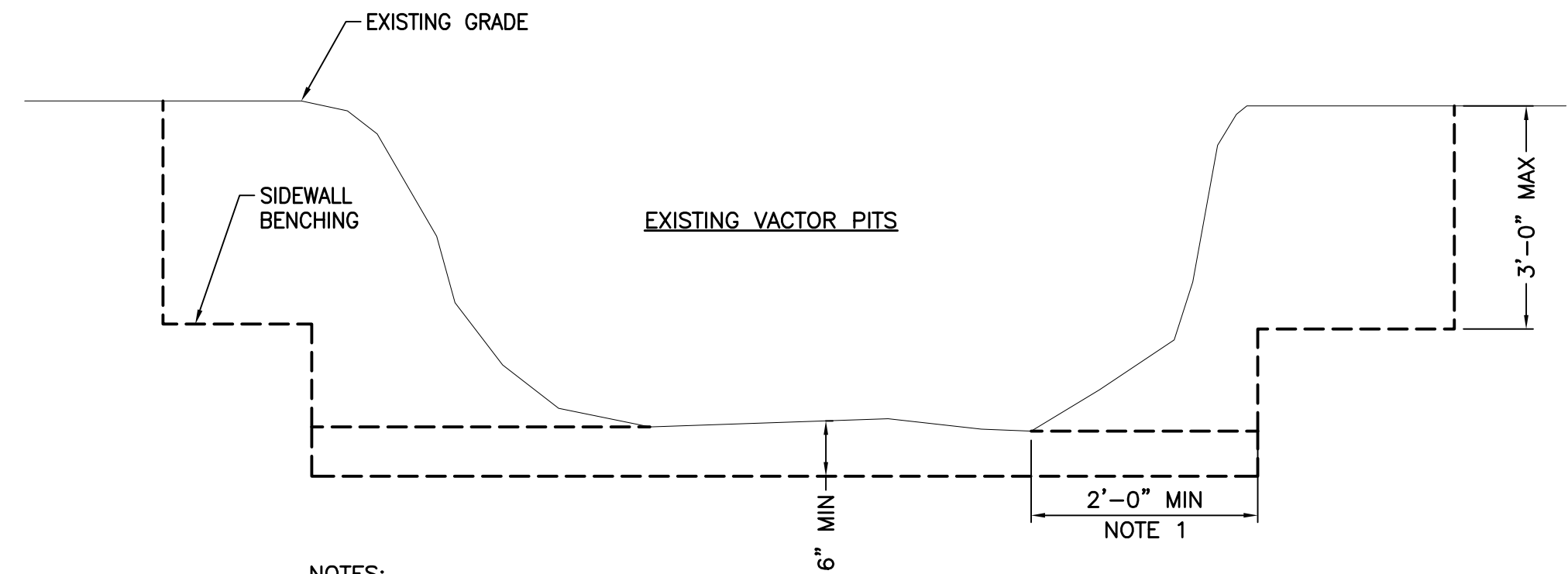
SLAB ON GRADE DETAIL
NTS

2
TYP



AC CURB DETAIL
NTS

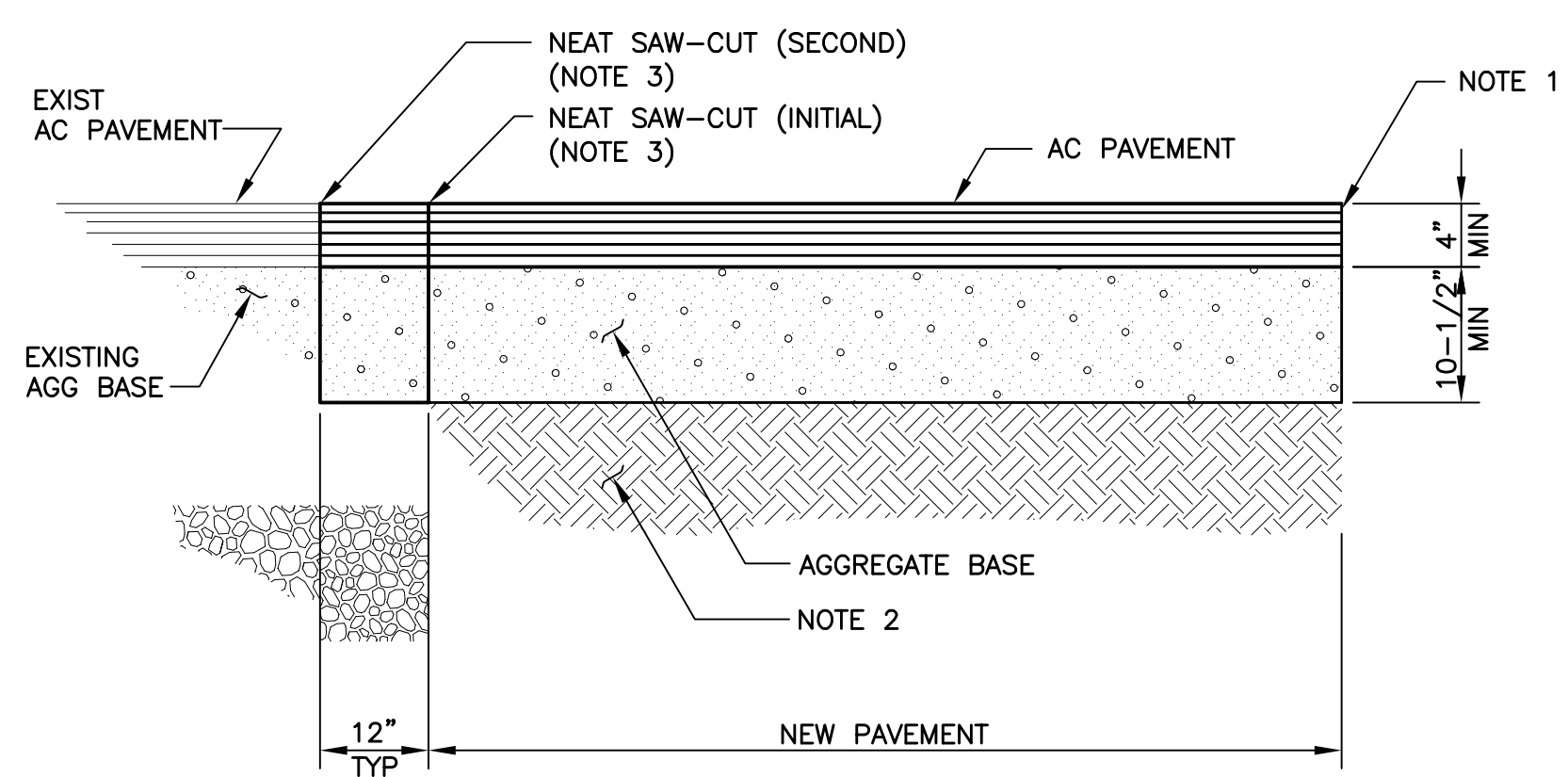
3
TYP



- NOTES:**
- EXCAVATE VECTOR PITS OF ALL LOOSE AND/OR WET MATERIAL. BENCH SIDEWALLS AS SHOWN AND BACKFILL WITH ENGINEERED FILL AND COMPACT TO 90%. SEE ALSO SECTION 5.21 OF THE GEOTECHNICAL REPORT.

EXISTING VECTOR PIT FILL DETAIL
NTS

5
TYP



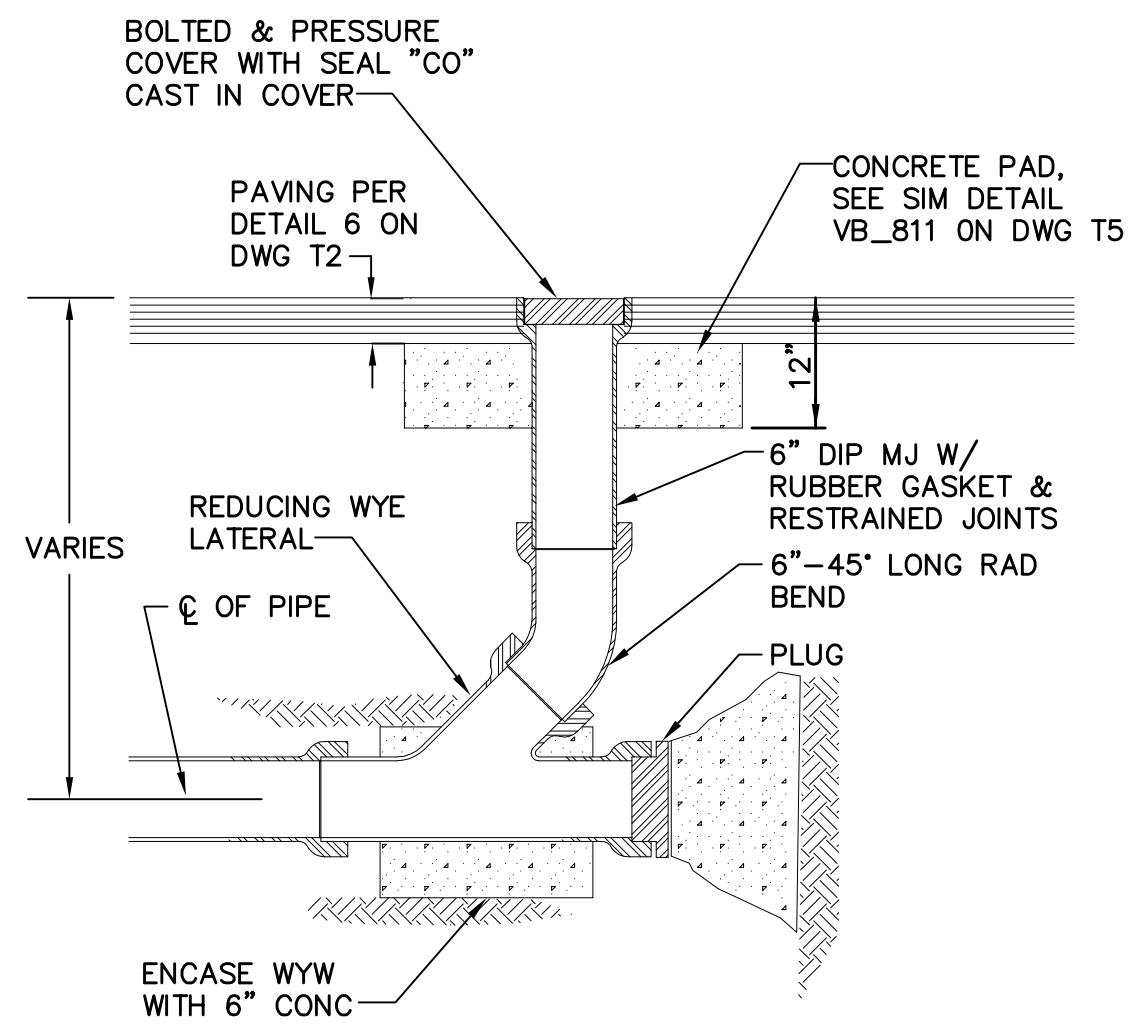
- NOTES:**
- PROVIDE TRIM BOARD WHERE PAVEMENT EXTENDS UP TO UNPAVED SURFACES.
 - COMPACTED SUBGRADE, IN NON-TRENCH AREA. IN TRENCH AREA, FOR MATERIAL REQUIREMENTS SEE SPECIFICATION, SECTION 02200.
 - THE ASPHALT CONCRETE SHALL BE CUT THROUGH THE FULL DEPTH OF EXISTING ASPHALT CONCRETE TO A NEAT STRAIGHT LINE. PAVEMENT EDGES DAMAGED DURING CONSTRUCTION SHALL BE RE-CUT TO NEAT LINE PRIOR TO PAVING. PAINT BINDER (TACK COAT) SHALL BE APPLIED TO ALL VERTICAL SURFACES IN ACCORDANCE WITH THE LATEST EDITION OF CALTRANS STANDARD SPECIFICATIONS.

AC PAVEMENT DETAIL
NTS

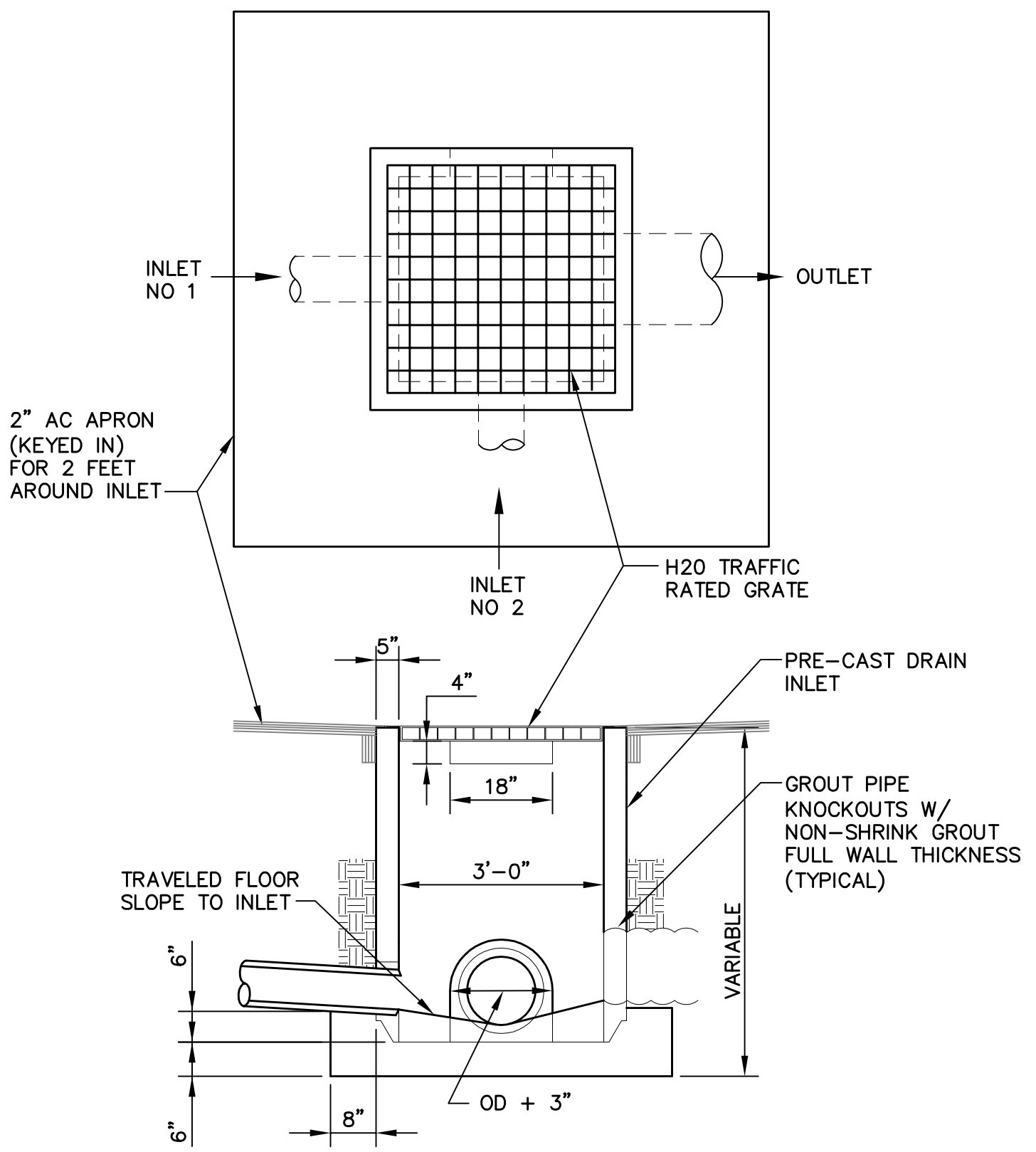
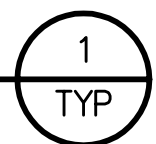
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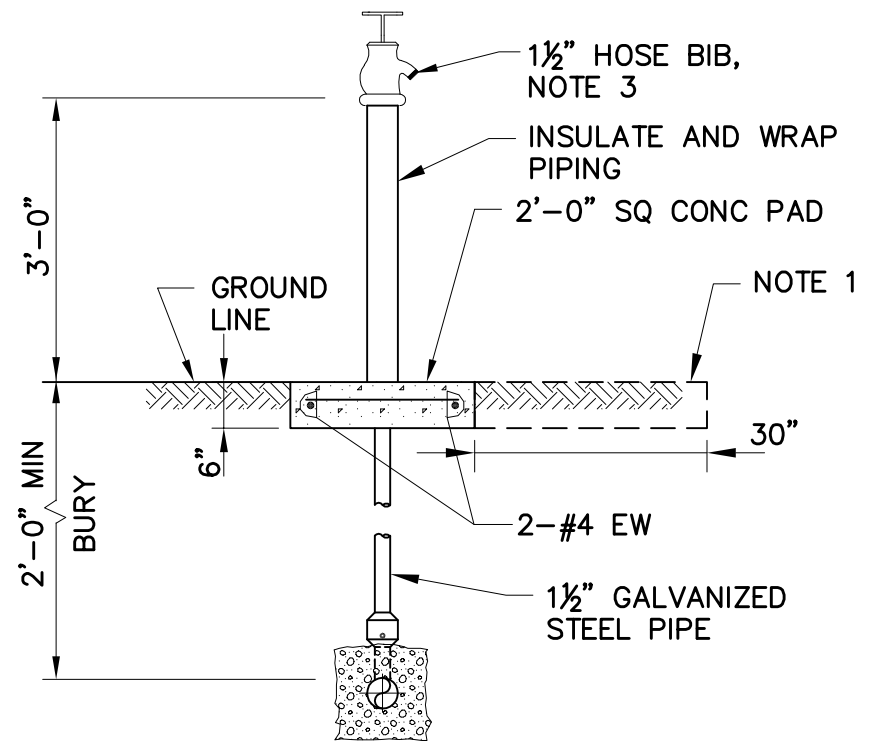
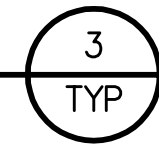
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		AS NOTED	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DRAWN JIM CADE				1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762	Ph: (916) 933-1997 Fax: (916) 933-4778	6230 Sylvan Rd, Citrus Heights, CA 95610	TYPICAL DETAILS 2



CLEAN-OUT DETAIL
NTS

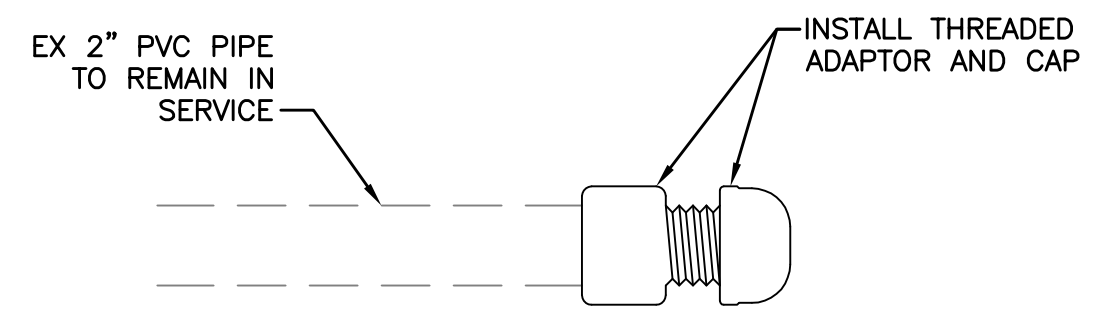
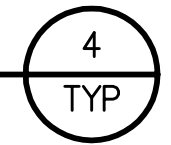


DROP INLET DETAIL
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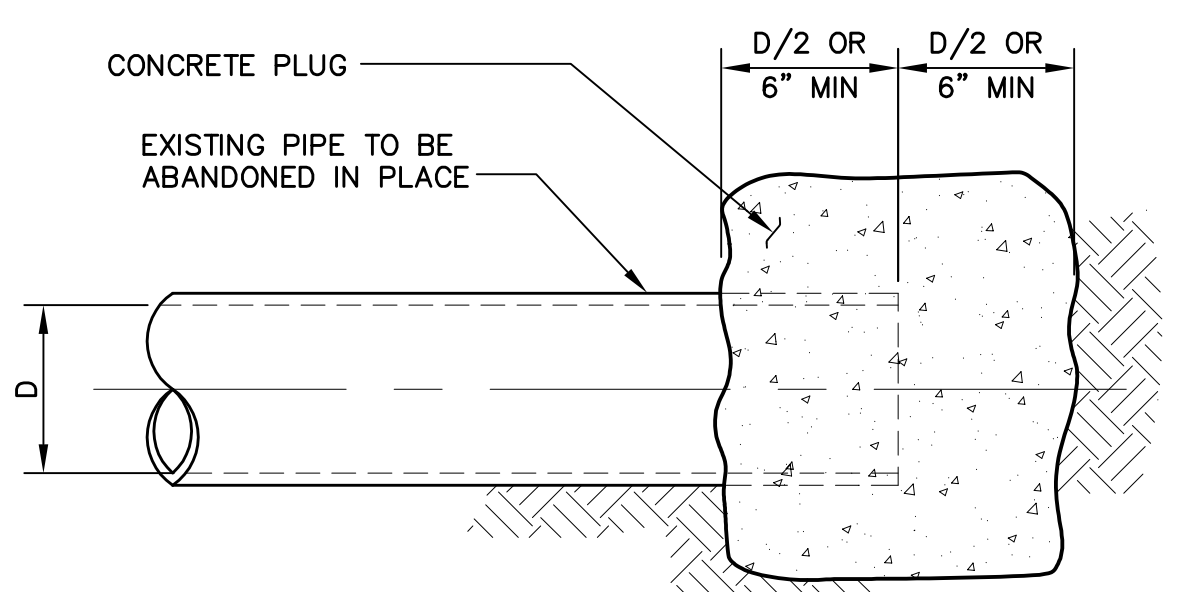
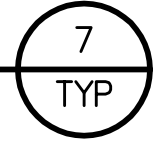


- NOTE:**
1. ALL HOSE BIBS SHALL HAVE A HOSE RACK.
 2. WHEN NOT LOCATED BY A WALL OR A RAILING, EXPAND THE CONCRETE PAD AS SHOWN FOR FREE STANDING HOSE RACK.
 3. REFER TO SPECIFICATION SECTION 15100 FOR HOSE BIB REQUIREMENTS.

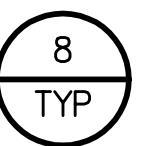
YARD HYDRANT DETAIL
NTS



PIPE CAP DETAIL
NTS



PIPE PLUG DETAIL
NO SCALE



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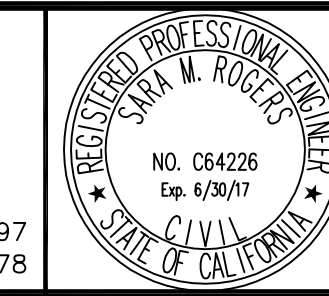
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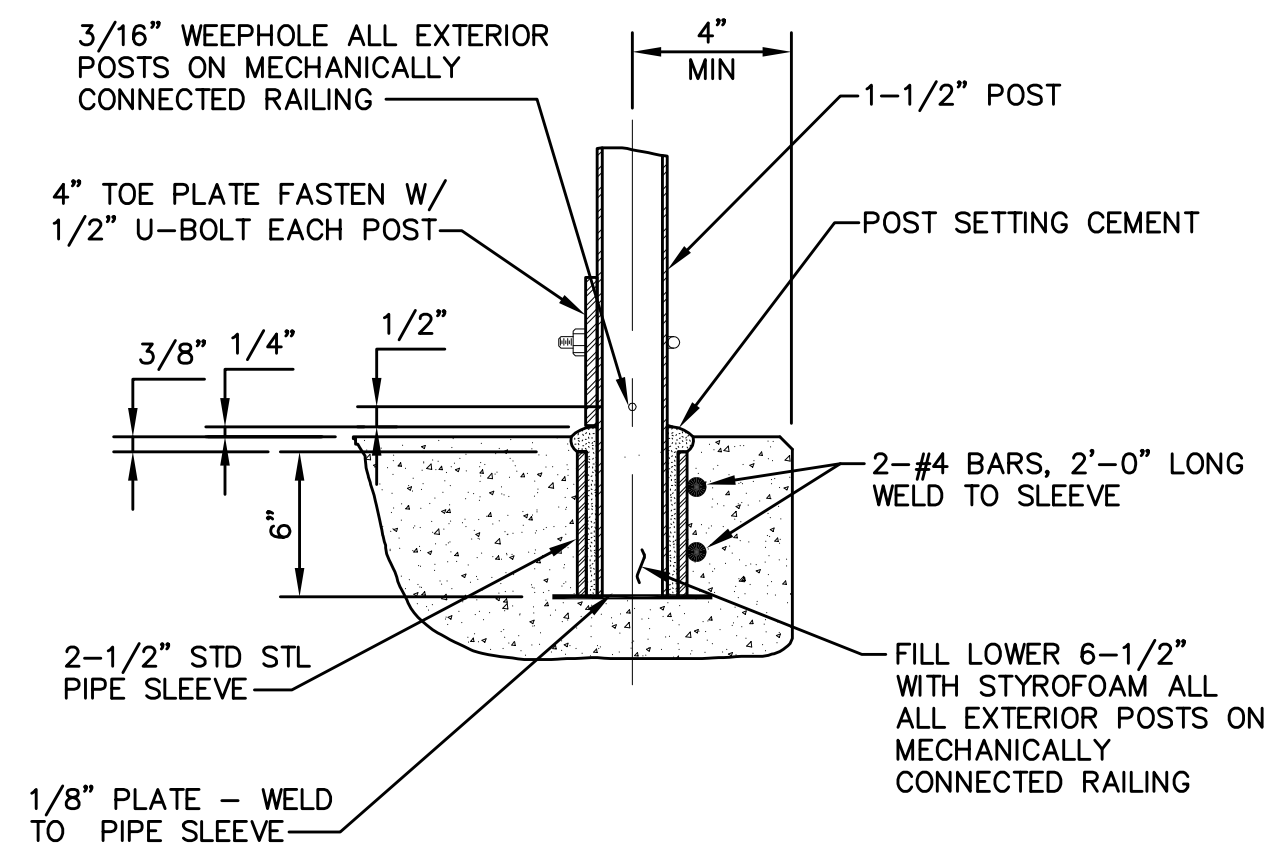


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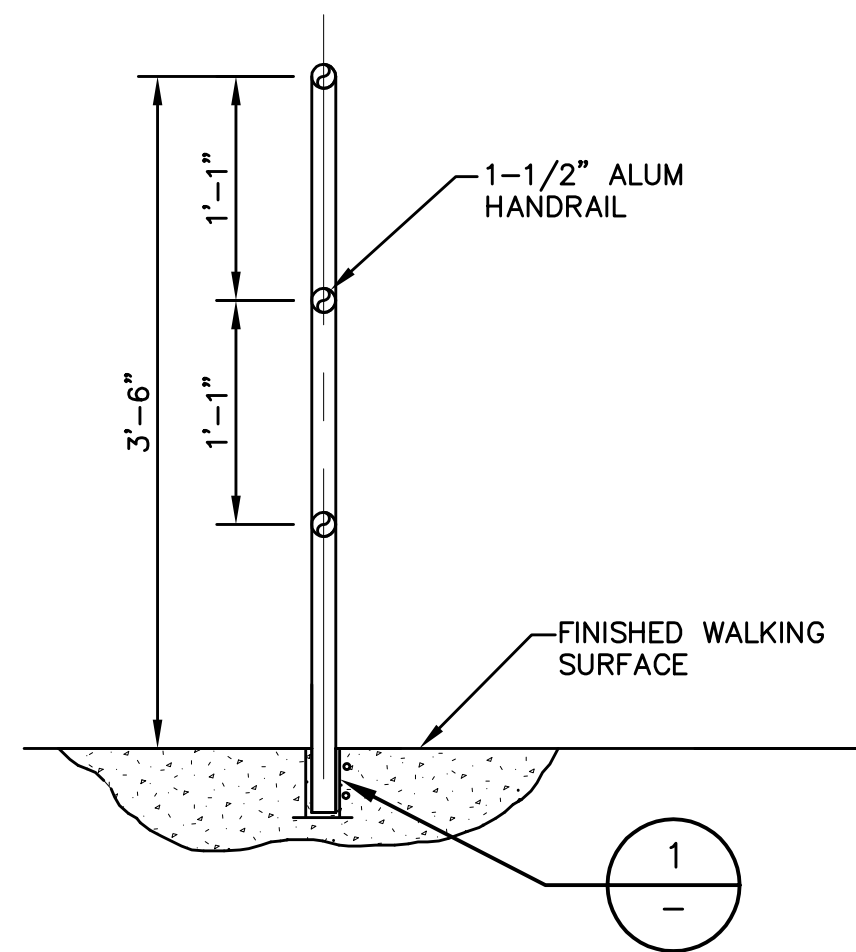
CORPORATION YARD IMPROVEMENT PROJECT	
TYPICAL DETAILS 3	

DRAWING T3	
SHEET 20	of 28



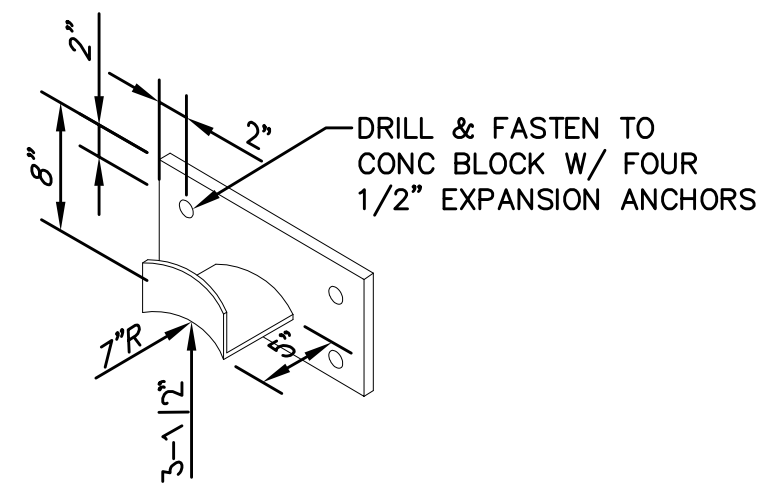
GUARDRAIL POST SETTING DETAIL

1
TYP



GUARDRAIL DETAIL

3
TYP



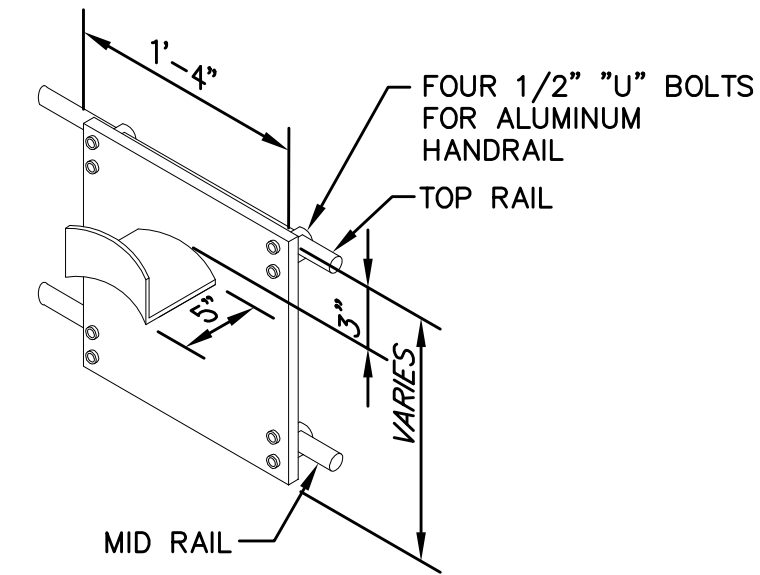
WALL MOUNTED

NOTES:

1. WELDED CONSTRUCTION ALL MATERIAL NO 8 GALVANIZED STEEL PLATE HOT DIPPED GALVANIZED AFTER FABRICATION (TYP).
2. LOCATE HOSE RACK AT EACH HOSEBIB AND HYDRANT.

HOSE RACK DETAIL

4
TYP



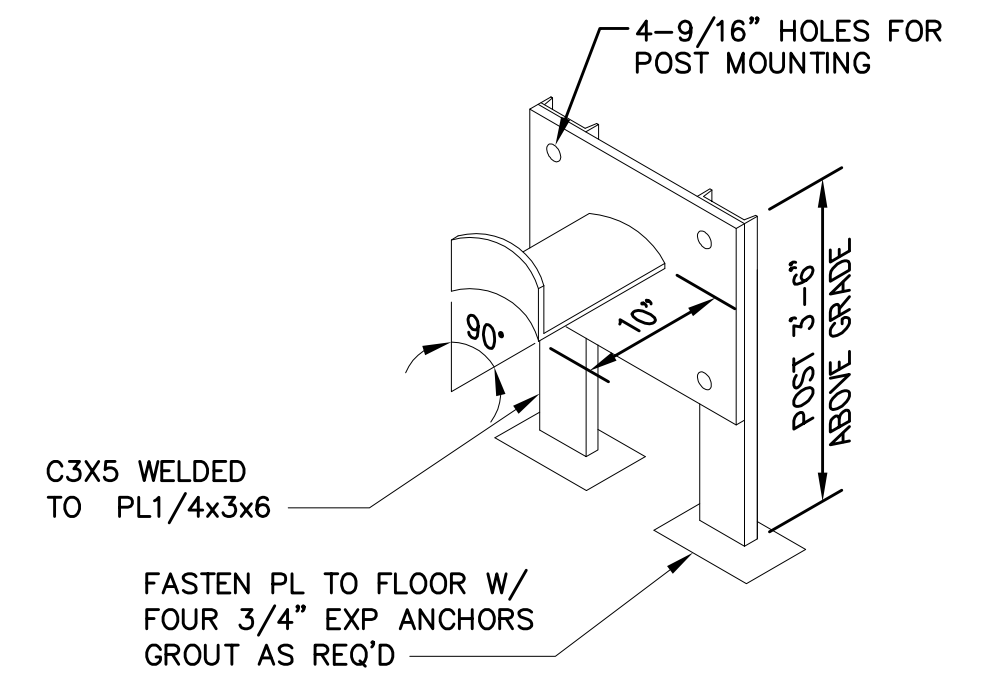
RAIL MOUNTED

NOTES:

1. HOT DIP GALVANIZE ALL STEEL PARTS AFTER FABRICATION

HOSE RACK DETAIL

5
TYP



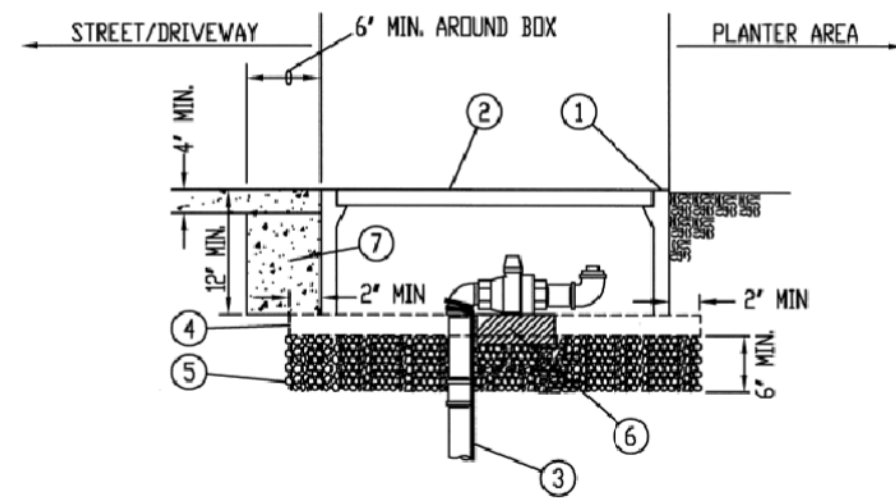
POST MOUNTED

NOTE:

1. WELDED CONSTRUCTION ALL MATERIAL NO 8 GALVANIZED STEEL PLATE & HOT DIPPED GALVANIZED AFTER FABRICATION

HOSE RACK DETAIL

6
TYP



NOTES:

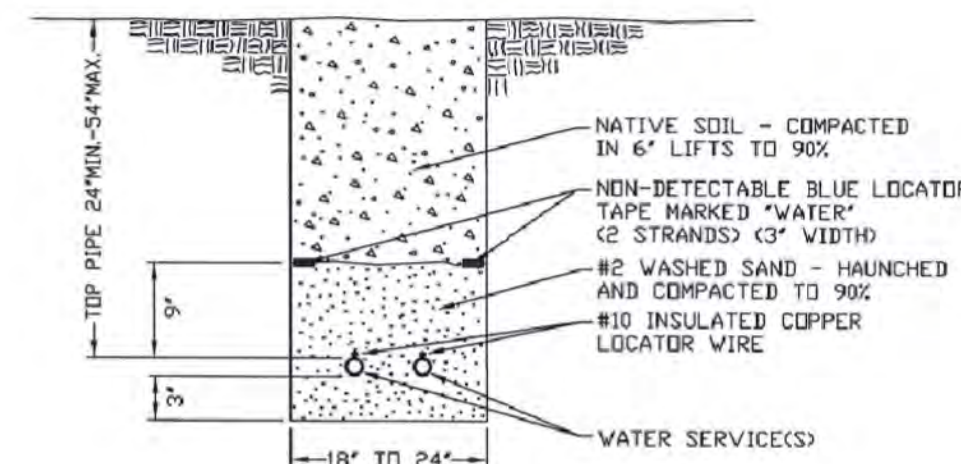
- VALVE OPERATING HANDLE SHALL BE CENTERED IN BOX AND FULLY ACCESSIBLE.
- MATERIAL BELOW CRUSHED ROCK SHALL BE COMPACTED TO 95% MINIMUM.
- CONCRETE ENCASEMENT SHALL BE ALLOWED TO CURE 24 HOURS MINIMUM PRIOR TO FINISH PAVING.
- LID SHALL BE MARKED "WATER"

NO.	DESCRIPTION	QUANTITY	UNIT	REMARKS
1	NON-TRAFFIC AREA SIDEWALK/DV	5	3/4"	CLEAN CRUSHED ROCK
2	BOX CARSON 1220-12 CHRISTY FL30TRUCK CHRISTY B1324BOX	6	CONCRETE BRICK - 2 1/4" x 3 3/4" x 7 1/2"	
3	LID CARSON 1220-18 CHRISTY FL30T CHRISTY B1324-6LH	7	CONCRETE ENCASEMENT AROUND VALVE BOX - TYPE II SIX-SACK PORTLAND CEMENT	
4	#10 INSULATED COPPER LOCATOR WIRE			
5	2" x 6" PRESSURE TREATED DOUGLAS FIR SUPPORTS (2)			

BLOW-OFF VALVE BOX

CITRUS HEIGHTS WATER DISTRICT

APPROVED BY: *Beat A. Cuhlo* DATE: 5/8/13
 CITRUS HEIGHTS WATER DISTRICT
 PAGE: VB_815



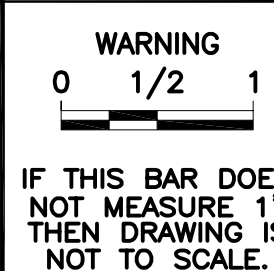
SERVICE LINE TRENCH DETAIL - NATIVE

CITRUS HEIGHTS WATER DISTRICT

APPROVED BY: *Melissa Piro* DATE: 4/19/17
 CITRUS HEIGHTS WATER DISTRICT
 PAGE: TREN_721

I:\ASERVER\PROJECTS\PROJECT FILES\CHWD - CORP YARD\DWGS\CHWD001-TYP\METDET.DWG

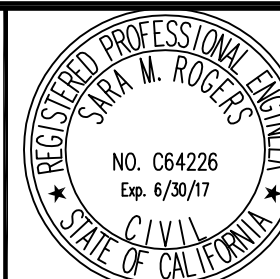
SCALE:
AS NOTED



DESIGNED DARYL W. HEIGHER
 DRAWN JIM CADE
 CHECKED SARA ROGERS
 DATE 05/03/17

DOMENICHELLI & ASSOCIATES

1101 Investment Blvd, Suite 115 Ph: (916) 933-1997
 El Dorado Hills, CA 95762 Fax: (916) 933-4778



BENCHMARK INFORMATION:
 A.P.N. 243-0180-005, 006, 007, 009, 011, 046
 BENCHMARK NO. 14-61 ELEV. 163.13
 7/8" METAL DISC STAMPED "CO. B.M. 14-61"
 LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB
 RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD.
 VERTICAL DATUM - NAVD 29



CORPORATION YARD IMPROVEMENT PROJECT

TYPICAL DETAILS 4

DRAWING
T4

SHEET
21 of 28

DATE DESCRIPTION

I:\ASERVER\PROJECTS\PROJECT FILES\CHWD - CORP YARD\DWGS\CHWD001-TYP CHWD DETAILS.DWG

2" BLOW-OFF VALVE

CITRUS HEIGHTS WATER DISTRICT

APPROVED BY: *Robert A. Chumblee* DATE: 7/31/15
DESIGN: P.A.D.
CITRUS HEIGHTS WATER DISTRICT
CAD FILE: BO_511.DWG
PAGE: **BO_511**

1	MJ CAP W/ 2" FIP OUTLET	11	2" BRASS 90° ELBOW
2	2" x 6" BRASS NIPPLE	12	2" BRASS PLUG, FINGER TIGHT
3	2" BRASS 90° ELBOW	13	NON-Traffic AREA SIDEWALK/DW
4	2" x 24" BRASS NIPPLE	14	BOX CARSON 1220-4B CHRISTY FL301 CHRISTY B1324B
5	#10 INSULATED COPPER LOCATOR WIRE	15	LID CARSON 1220-4B CHRISTY FL301 CHRISTY B1324-6LJH
6	2" BRASS COUPLING - ONE ONLY	16	2" x 6" PRESSURE TREATED DOUGLAS FIR SUPPORTS (2)
7	2" BRASS NIPPLE - ONE ONLY, LENGTH AS NECESSARY TO ADJUST TO PROPER GRADE	17	3/4" CLEAN CRUSHED ROCK
8	2" BRASS STREET ELBOW	18	CONCRETE BRICK - 2 1/4" x 3 3/4" x 7 1/2"
9	2" BRASS GATE VALVE-NUT HALF OR EQUAL w/ 4" BRASS HANDWHEEL	19	CONCRETE ENCASMENT AROUND VALVE BOX - TYPE II SIX-SACK PORTLAND CEMENT
10	2" x 3" BRASS NIPPLE		

NOTES:
 • BOLT TORQUE ON ALL FITTINGS SHALL CONFORM TO MANUFACTURER'S SPECIFICATIONS.
 • MATERIAL BELOW CRUSHED ROCK SHALL BE COMPACTED TO 95% MINIMUM.
 • LID SHALL BE MARKED "WATER"
 • VALVE OPERATING HANDLE SHALL BE CENTERED IN BOX AND FULLY ACCESSIBLE.
 • CONCRETE ENCASMENT SHALL BE ALLOWED TO CURE 24 HOURS MINIMUM PRIOR TO FINISH PAVING.

FIRE HYDRANT - 6" CONNECTION (STREET SIDE)

CITRUS HEIGHTS WATER DISTRICT

APPROVED BY: *Robert A. Chumblee* DATE: 5/8/13
DESIGN: P.A.D.
CITRUS HEIGHTS WATER DISTRICT
CAD FILE: FH_612.DWG
PAGE: **FH_612**

1	TEE - DUCTILE IRON - FLANGED OUTLET	7	VALVE BOX/LID - MARKED "WATER", DUCTILE PRECAST NO. G04 BOX, G04C LID
2	6" GATE VALVE - RESILIENT WEDGE - FLANGED TO TEE x MECHANICAL JOINT	8	CONCRETE ENCASMENT AROUND VALVE BOX - TYPE II SIX-SACK PORTLAND CEMENT - SEE DETAIL VB_811
3	6" DUCTILE IRON PIPE - PC350	9	#10 INSULATED COPPER LOCATOR WIRE
4	STEAMER FIRE HYDRANT - MUELLER A-423 DR AMERICAN DARLING 884B - MINIMUM 48" BURY, MECHANICAL JOINT INLET. SHALL BE FACTORY WHITE.	10	CONCRETE BRICK - 2 1/4" x 3 3/4" x 7 1/2"
5	BRASS PLUGS SHALL BE INSTALLED IN DRAIN HOLES IN SHOE.	11	CONCRETE THRUST BLOCK - SEE DETAIL TB_001
6	8" RISER - SDR35 ONLY, CONTINUOUS SECTION	12	BLUE REFLECTIVE MARKER - INSTALLED PER SACRAMENTO METROPOLITAN FIRE DISTRICT SPECIFICATIONS

NOTES:
 • NO FIRE HYDRANT EXTENSIONS ARE ALLOWED.
 • BOLT TORQUE ON ALL FITTINGS SHALL CONFORM TO MANUFACTURER'S SPECIFICATIONS.
 • AREA AROUND FIRE HYDRANT SHALL BE COMPACTED TO 90% MINIMUM.
 • PAINT HYDRANT BURY USING A MANUFACTURER'S RECOMMENDED PRIMER, FINISH WITH RUSTOLEUM GLOSS WHITE, TWO COATS MINIMUM. PRIOR TO PAINTING, CLEAN ALL SURFACES WITH SOAP AND WATER USING AN ABRASIVE PAD.

FIRE HYDRANT ACCESS PAD w/ BARRICADES

CITRUS HEIGHTS WATER DISTRICT

APPROVED BY: *Robert A. Chumblee* DATE: 5/8/13
DESIGN: P.A.D.
CITRUS HEIGHTS WATER DISTRICT
CAD FILE: FH_684.DWG
PAGE: **FH_684**

1	REINFORCED CONCRETE PAD - TYPE II SIX-SACK PORTLAND CEMENT	5	7/2" x 6" SCH 40 STEEL PIPE FILLED WITH CONCRETE, TYPE II SIX-SACK PORTLAND CEMENT
2	3/8" (83) REBAR - 2" INSIDE PERIMETER	6	12" DIAMETER HOLE FILLED W/ CONCRETE, TYPE II SIX-SACK PORTLAND CEMENT
3	CONCRETE DOBBIE W/ WIRE	7	ASPHALT SATURATED ORGANIC FELT GROUND PAPER - ASTM 30, 2 LAYERS AROUND FIRE HYDRANT
4	3/4" CLASS II AGGREGATE BASE - 2" MINIMUM, MECHANICALLY COMPACTED TO 90%		

NOTES:
 • CONCRETE PAD TO BE POURED INDEPENDENT OF OTHER CONCRETE WORK.
 • CONTACT UNDERGROUND SERVICE ALERT 48 HOURS PRIOR TO INSTALLING BARRICADES. 1 (800) 642-2444 OR 811
 • CONTACT CITRUS HEIGHTS WATER DISTRICT FOR REBAR INSPECTION PRIOR TO POURING CONCRETE AND PRIOR TO INSTALLING BARRICADES. (916) 725-6873
 • MATERIALS BELOW AGGREGATE BASE SHALL BE COMPACTED TO 90% MINIMUM.
 • REINFORCED CONCRETE PAD SHALL BE FINISHED WITH AN EDGING TOOL AROUND THE ENTIRE PERIMETER AND BROOMED AT RIGHT ANGLES TO THE DIRECTION OF TRAFFIC.
 • PAINT FIRE HYDRANT AND BARRICADES USING A RUSTOLEUM RECOMMENDED PRIMER, FINISH WITH RUSTOLEUM GLOSS WHITE, TWO COATS MINIMUM. PRIOR TO PAINTING, CLEAN ALL SURFACES WITH SOAP AND WATER USING AN ABRASIVE PAD.

3/4" TO 2" REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY w/ BACKFLOW ENCLOSURE

CITRUS HEIGHTS WATER DISTRICT

APPROVED BY: *Robert A. Chumblee* DATE: 5/8/13
DESIGN: P.A.D.
CITRUS HEIGHTS WATER DISTRICT
CAD FILE: RP_312.DWG
PAGE: **RP_312**

1	BRASS ELBOW	11	INSULATED BACKFLOW ENCLOSURE - SECURED TO PAD w/ 1/2" x 4" SLEEVE ANCHORS (SEE HEAD OR EQUAL) - SEE ABOVE NOTE
2	BRASS NIPPLE - CONTINUOUS	12	REINFORCED CONCRETE PAD - TYPE II SIX-SACK PORTLAND CEMENT - SEE ABOVE NOTE FOR SIZE
3	BRASS UNION	13	CONCRETE DOBBIE W/ WIRE
4	3" OR 4" BRASS NIPPLE	14	3/8" (83) REBAR - 2" INSIDE PERIMETER
5	BRASS STREET ELBOW	15	2" PVC SLEEVES - SAND FILLED
6	WYE STRAINER - BRONZE W/ PLUG	16	3/4" CLASS II AGGREGATE BASE - 2" MINIMUM, MECHANICALLY COMPACTED TO 90%
7	CLOSE BRASS NIPPLE	17	PRESSURE REGULATOR - AS DETERMINED BY THE APPROPRIATE GOVERNING AUTHORITY
8	REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY w/ BALL VALVES AND TEST COCKS w/ BRASS PLUGS (4)		
9	24" BRASS NIPPLE		
10	PVC COUPLING - SCH 80, THREADED		

NOTES:
 • REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY SHALL BE PLUMB.
 • CONTACT CITRUS HEIGHTS WATER DISTRICT FOR REBAR INSPECTION PRIOR TO POURING CONCRETE. (916) 725-6873
 • MATERIAL BELOW AGGREGATE BASE SHALL BE COMPACTED TO 90% MINIMUM.
 • REINFORCED CONCRETE PAD SHALL BE FINISHED WITH AN EDGING TOOL AROUND THE ENTIRE PERIMETER AND BROOMED AT RIGHT ANGLES TO THE DIRECTION OF TRAFFIC.
 • PPA SHALL BE TESTED BY A CHD CERTIFIED BACKFLOW PREVENTION ASSEMBLY TESTER PRIOR TO DISTRICT ACCEPTANCE OF FACILITIES.
 • COLOR OF ENCLOSURE TO BE DETERMINED BY DISTRICT INSPECTOR.

4 THROUGH 12" TRENCH DETAIL - NATIVE

CITRUS HEIGHTS WATER DISTRICT

APPROVED BY: *Robert A. Chumblee* DATE: 5/8/13
DESIGN: P.A.D.
CITRUS HEIGHTS WATER DISTRICT
CAD FILE: TREN_711.DWG
PAGE: **TREN_711**

MAIN DIAMETER	MINIMUM TRENCH WIDTH
4"	18"
6"	24"
8"	24"
10"	30"
12"	30"

NOTES:
 • NATIVE SOIL - COMPACTED IN 6" LIFTS TO 90%
 • NON-DETECTABLE BLUE LOCATOR TAPE MARKED "WATER" (2 STRANDS) (3" WIDTH)
 • #10 INSULATED COPPER LOCATOR WIRE
 • #2 WASHED SAND - HALUNCHED AND COMPACTED TO 90%

PROTECTION BARRICADES

CITRUS HEIGHTS WATER DISTRICT

APPROVED BY: *Robert A. Chumblee* DATE: 5/8/13
DESIGN: P.A.D.
CITRUS HEIGHTS WATER DISTRICT
CAD FILE: FH_685.DWG
PAGE: **FH_685**

NOTES:
 • CONTACT UNDERGROUND SERVICE ALERT 48 HOURS PRIOR TO INSTALLING BARRICADES. 1 (800) 642-2444 OR 811
 • CONTACT CITRUS HEIGHTS WATER DISTRICT FOR INSPECTION PRIOR TO INSTALLING BARRICADES. (916) 725-6873
 • PAINT BARRICADES USING A RUSTOLEUM RECOMMENDED PRIMER, FINISH WITH RUSTOLEUM GLOSS WHITE, TWO COATS MINIMUM. PRIOR TO PAINTING, CLEAN ALL SURFACES WITH SOAP AND WATER USING AN ABRASIVE PAD.

WATER MAIN VALVE BOX - STREET/DRIVEWAY

CITRUS HEIGHTS WATER DISTRICT

APPROVED BY: *Robert A. Chumblee* DATE: 5/8/13
DESIGN: P.A.D.
CITRUS HEIGHTS WATER DISTRICT
CAD FILE: VB_811.DWG
PAGE: **VB_811**

1	VALVE BOX/LID - MARKED "WATER", DUCTILE PRECAST NO. G04 BOX, G04C LID	10	2" COPPER/BRASS METER YOKE - 12" w/ 2 FULL-PORT ANGLE BALL VALVES INCLUDING PADLOCK WINGS ON INLET AND OUTLET
2	CONCRETE ENCASMENT AROUND VALVE BOX - TYPE II SIX-SACK PORTLAND CEMENT	11	2" WATER METER (BY DISTRICT)
3	8" RISER - SDR35 ONLY, CONTINUOUS SECTION	12	2" METER FLANGES AND TOLER (BY CONTRACTOR)
4	#10 INSULATED COPPER LOCATOR WIRE	13	2" x 18" PVC NIPPLE - SCH 80 (BRASS IF BACKFLOW)
		14	2" PVC COUPLING - SCH 80
		15	METER BOX CARSON 1730-15 CHRISTY FL36TRD12
		16	LID CARSON 1730-4B CHRISTY FL36-TRD12
		17	2" x 6" PRESSURE TREATED DOUGLAS FIR SUPPORTS (2) (PROPER GRADE)
		18	3/4" CLEAN CRUSHED ROCK
		19	#2 WASHED SAND COMPACTED TO 90%
		20	#10 INSULATED COPPER LOCATOR WIRE

NOTES:
 • RISER SHALL BE PLUMB.
 • VALVE OPERATING NUT SHALL BE CENTERED IN THE RISER AND FULLY ACCESSIBLE.
 • MATERIAL BELOW CONCRETE ENCASMENT SHALL BE COMPACTED TO 95% MINIMUM.
 • CONCRETE ENCASMENT SHALL BE ALLOWED TO CURE 24 HOURS MINIMUM PRIOR TO FINISH PAVING.
 • TRIANGULAR LID SHALL POINT IN THE DIRECTION OF THE MAIN WHICH IS ISOLATED BY THE VALVE.

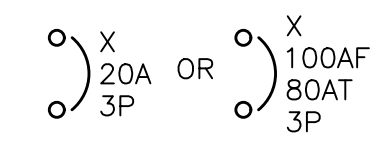
2" POLYETHYLENE WATER SERVICE - 2" WATER METER NEW CONSTRUCTION

CITRUS HEIGHTS WATER DISTRICT

APPROVED BY: *Robert A. Chumblee* DATE: 9/25/14
DESIGN: P.A.D.
CITRUS HEIGHTS WATER DISTRICT
CAD FILE: WS_200PE.DWG
PAGE: **WS_200PE**

1	2" BRONZE SADDLE - IPT	10	2" COPPER/BRASS METER YOKE - 12" w/ 2 FULL-PORT ANGLE BALL VALVES INCLUDING PADLOCK WINGS ON INLET AND OUTLET
2	2" CORPORATION STOP - FULL-PORT BALL, MP x CTS COMP w/ STAINLESS STEEL INSERT (2" CTS INSERT-55-D)	11	2" WATER METER (BY DISTRICT)
3	2" POLYETHYLENE TUBING - CTS ENDPORE PE-4710 SDR9 (250 PSD) DR EQUAL	12	2" METER FLANGES AND TOLER (BY CONTRACTOR)
4	2" BRASS STREET ELBOW - CTS COMP x MIP w/ STAINLESS STEEL INSERT (2" CTS INSERT-55-D)	13	2" x 18" PVC NIPPLE - SCH 80 (BRASS IF BACKFLOW)
5	2" BRASS STREET ELBOW	14	2" PVC COUPLING - SCH 80
6	2" VALVE - FULL-PORT BALL, FIP x FIP OR CTS COMP x FIP w/ STAINLESS STEEL INSERT (2" CTS INSERT-55-D)	15	METER BOX CARSON 1730-15 CHRISTY FL36TRD12
7	2" BRASS NIPPLE (AS NECESSARY TO ADJUST TO PROPER GRADE)	16	LID CARSON 1730-4B CHRISTY FL36-TRD12
8	2" BRASS UNION	17	2" x 6" PRESSURE TREATED DOUGLAS FIR SUPPORTS (2)
9	2" x CLOSE BRASS NIPPLE	18	3/4" CLEAN CRUSHED ROCK
		19	#2 WASHED SAND COMPACTED TO 90%
		20	#10 INSULATED COPPER LOCATOR WIRE

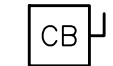
NOTES:
 • CARSON 1220-4B "1" TYPE LID: SHALL INCLUDE STRAIGHT TYPE HEXAGON LOCK-DOWN BOLT (1) AND TOUCH READ HOLE. SHALL BE MARKED "WATER"
 • CHRISTY FL301 RECESSED LID: SHALL INCLUDE STRAIGHT TYPE PENTAHEAD LOCK-DOWN BOLTS (2) AND TOUCH READ HOLE. SHALL BE MARKED "WATER"
 • METER YOKE: FORD, JONES, MUELLER, McDONALD



LOW VOLTAGE CIRCUIT BREAKER (CB). RATINGS AND NO. OF POLES AS SHOWN. WHEN SPECIFIC TYPE IS REQUIRED, X INDICATES TYPE.

TYPES:

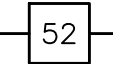
- MCCB - MOLDED CASE
ICCB - INSULATED CASE
LVP - LOW VOLTAGE POWER
MCP - MOTOR CIRCUIT PROTECTOR (RATING PER CONNECTED LOAD)



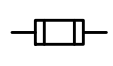
SEPARATELY MOUNTED CIRCUIT BREAKER, SEE ELECTRICAL ONE LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION



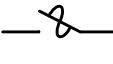
GROUND FAULT PROTECTION



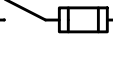
MEDIUM VOLTAGE CIRCUIT BREAKER



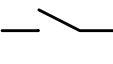
FUSE, SIZE AND NUMBER OF FUSES AS NOTED



FUSED CUTOUT, CURRENT RATING, FUSE SIZE AND NUMBER OF POLES AS NOTED



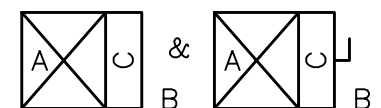
FUSIBLE SWITCH, CURRENT RATING, FUSE SIZE AND QUANTITY AS NOTED



NON-FUSED SWITCH, CURRENT RATING AND NUMBER OF POLES AS NOTED



DISCONNECT OR DRAWOUT CONNECTION



MAGNETIC MOTOR STARTER AND SEPARATELY MOUNTED COMBINATION MAGNETIC MOTOR STARTER.



MOTOR CONTROLLER AND SEPARATELY MOUNTED MOTOR CONTROLLER WITH SHORT CIRCUIT PROTECTION AND DISCONNECT.

MOTOR STARTER AND CONTROLLER SUBSCRIPTS:

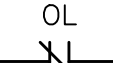
- A - MAGNETIC STARTER NEMA SIZE
B - STARTER TYPE
NONE - FULL VOLTAGE NON-REVERSING (FVNR)
FVR - FULL VOLTAGE REVERSING
2S - TWO SPEED
RVAT - REDUCED VOLTAGE AUTO TRANSFORMER
C - CONTROL DIAGRAM OR CONTROLS SCHEDULE NUMBER (IF REQUIRED)
D - CONTROLLER TYPE
VFD - VARIABLE FREQUENCY DRIVE
SS - SOLID STATE



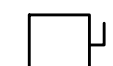
SEPARATELY MOUNTED COMBINATION MOTOR STARTER OR CONTROLLER, SEE ELECTRICAL ONE LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION



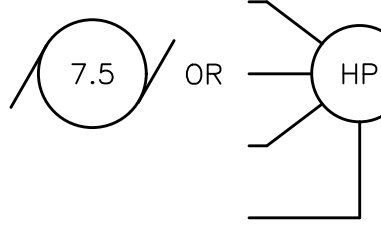
THERMAL OVERLOAD ELEMENT



THERMAL OVERLOAD RELAY CONTACT



DISCONNECT OR SAFETY SWITCH, 30A, 3P, NON-FUSED UNLESS OTHERWISE NOTED



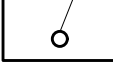
MOTOR WITH DESIGN HORSEPOWER (WHEN INDICATED)



GENERATOR



TRANSFER SWITCH, CURRENT RATING AND NUMBER OF POLES AS NOTED.

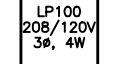


ATS - AUTOMATIC
MTS - MANUAL



TRANSFORMER

- 3 PHASE, 3 WIRE DELTA CONNECTION
3 PHASE, 4 WIRE GROUNDING WYE CONNECTION



SWITCHBOARD OR PANELBOARD. NAME, VOLTAGE, PHASE, NUMBER OF WIRES WHEN INDICATED.



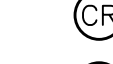
FIRE ALARM ANNUNCIATOR



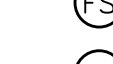
FIRE ALARM CONTROL PANEL



FIRE ALARM MANUAL PULL STATION



FIRE ALARM CONTROL RELAY



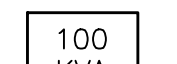
FIRE ALARM CONTACT, FLOW SWITCH



FIRE ALARM CONTACT, TAMPER SWITCH



FIRE ALARM CONTACT, PRESSURE SWITCH



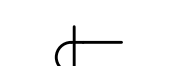
NON-MOTOR LOAD WITH DESIGN KVA, KW OR AMPS



CONTROL POWER TRANSFORMER (CPT)



VOLTAGE TRANSFORMER (VT OR PT)



CURRENT TRANSFORMER (CT)



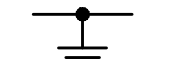
UTILITY WATT-HOUR METER PER UTILITY REQUIREMENTS



DIGITAL METERING PACKAGE



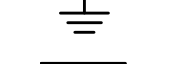
RUN TIME METER



GROUND



LIGHTNING ARRESTER



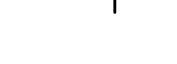
LOW VOLTAGE SURGE PROTECTIVE DEVICE



ELECTRICAL CONNECTION



NO ELECTRICAL CONNECTION



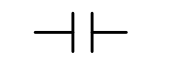
SOLENOID VALVE



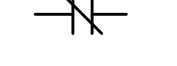
CONTROL/RELAY COIL, X INDICATES TYPE, Y INDICATES LOOP NO. WHEN USED

TYPES:

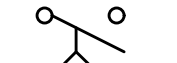
- CR - CONTROL RELAY
DP - DEFINITE PURPOSE RELAY
LC - LIGHTING CONTACTOR
M - MOTOR STARTER
PC - PHOTO CELL
TC - TIME CLOCK
TR - TIMING RELAY



NORMALLY OPEN CONTACT (N.O.)



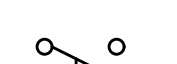
NORMALLY CLOSED CONTACT (N.C.)



NORMALLY OPEN TIME DELAY RELAY CONTACT, WITH TIME DELAY ON CLOSING AFTER COIL IS ENERGIZED



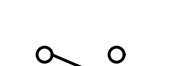
NORMALLY CLOSED TIME DELAY RELAY CONTACT, WITH TIME DELAY ON OPENING AFTER COIL IS ENERGIZED



NORMALLY OPEN TIME DELAY RELAY CONTACT, WITH TIME DELAY ON OPENING AFTER COIL IS DE-ENERGIZED



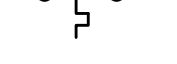
NORMALLY CLOSED TIME DELAY RELAY CONTACT, WITH TIME DELAY ON CLOSING AFTER COIL IS DE-ENERGIZED



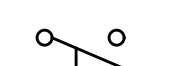
NORMALLY OPEN TEMPERATURE SWITCH, CLOSE ON RISING TEMPERATURE



NORMALLY CLOSED TEMPERATURE SWITCH, OPEN ON RISING TEMPERATURE



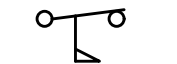
NORMALLY OPEN FLOW SWITCH, CLOSE ON INCREASING FLOW



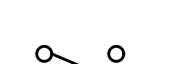
NORMALLY CLOSED FLOW SWITCH, OPEN ON INCREASING FLOW



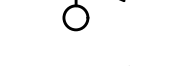
NORMALLY OPEN LEVEL SWITCH, CLOSE ON RISING LEVEL



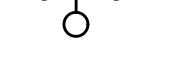
NORMALLY CLOSED LEVEL SWITCH, OPEN ON RISING LEVEL



ALARM BELL



ALARM HORN



ALARM FLASHING LIGHT



ALARM BELL AND FLASHING LIGHT COMBINATION UNIT



ALARM HORN AND FLASHING LIGHT COMBINATION UNIT

SUBSCRIPT:

- NONE - GENERAL ALARM DEVICE
F - FIRE ALARM DEVICE



NORMALLY OPEN PRESSURE SWITCH, CLOSE ON INCREASING PRESSURE



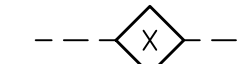
NORMALLY CLOSED PRESSURE SWITCH, OPEN ON INCREASING PRESSURE



NORMALLY OPEN LIMIT SWITCH, CLOSE ON REACHING LIMIT



NORMALLY CLOSED LIMIT SWITCH, OPEN ON REACHING LIMIT



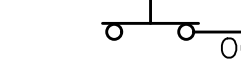
INTERLOCK, X INDICATES TYPE

TYPES:

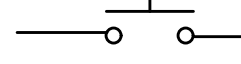
- E - ELECTRICAL
M - MECHANICAL
K - KEY



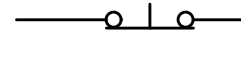
3 POSITION SELECTOR SWITCH, MAINTAINED CONTACTS, UNLESS OTHERWISE NOTED, 2 POSITION SIMILAR



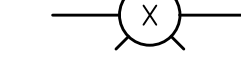
NORMALLY OPEN PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED



NORMALLY CLOSED PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED



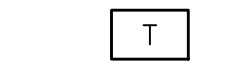
INDICATING LIGHT, X INDICATES LENS COLOR



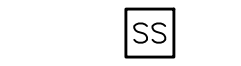
PUSH TO TEST INDICATING LIGHT, X INDICATES LENS COLOR

LENS COLORS:

- R - RED
G - GREEN
B - BLUE
Y - YELLOW
W - WHITE
A - AMBER



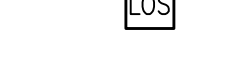
TRANSFORMER



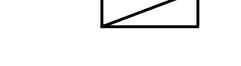
SELECTOR SWITCH



PUSHBUTTON



LOCKOUT/STOP PUSHBUTTON



CONTROL PANEL INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT



CONTROL PANEL WITH DISCONNECT SWITCH INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT



JUNCTION OR PULL BOX



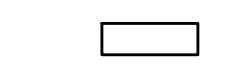
CONDUIT



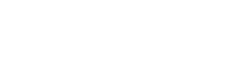
PANELBOARD (250V TO 600V)



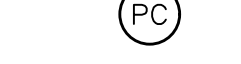
PANELBOARD (LESS THAN 250V)



ELECTRICAL EQUIPMENT ENCLOSURE: SWITCHBOARD, MOTOR CONTROL CENTER, CONTROL PANEL OR OTHER EQUIPMENT AS INDICATED



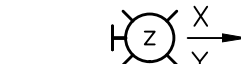
PHOTOCELL



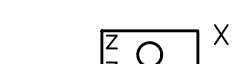
CEILING/PENDANT MOUNTED LUMINAIRE - HID, COMPACT FLUORESCENT OR INCANDESCENT



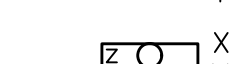
WALL MOUNTED LUMINAIRE - HID, COMPACT FLUORESCENT OR INCANDESCENT, ARROW SHOWS DIRECTION OF LUMINAIRE



CEILING/PENDANT MOUNTED FLUORESCENT FIXTURE



WALL MOUNTED FLUORESCENT FIXTURE



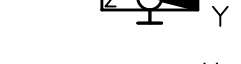
CEILING/PENDANT MOUNTED FLUORESCENT FIXTURE NORMAL/EMERGENCY



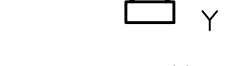
WALL MOUNTED FLUORESCENT FIXTURE NORMAL/EMERGENCY



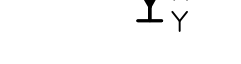
EMERGENCY LIGHT FIXTURE, 2 ATTACHED HEADS AS SHOWN



EMERGENCY LIGHT, REMOTE MOUNTED HEAD



SMOKE AND DUCT DETECTOR



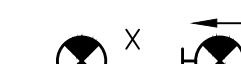
HEAT DETECTOR

SUBSCRIPT:

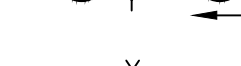
- I - IONIZATION TYPE
P - PHOTOELECTRIC TYPE

SUBSCRIPT:

- R/C - RATE COMPENSATION
R/F - COMBINATION RATE OF RISE AND FIXED TEMP
R - RATE OF RISE
F - FIXED



DOUBLE FACED CEILING OR WALL MOUNTED EXIT LIGHT, DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS



SINGLE FACED CEILING OR WALL MOUNTED EXIT LIGHT, DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS



AREA OR ROADWAY LIGHT - POLE MOUNTED

LIGHTING FIXTURE SUBSCRIPTS:

- X - INDICATES FIXTURE TYPE PER LIGHTING FIXTURE SCHEDULE
Y - INDICATES CIRCUIT NUMBER FROM PANELBOARD
z - INDICATES CONTROLLING SWITCH (IF REQUIRED)

TOGGLE SWITCH

SUBSCRIPTS:

- X - INDICATES TYPE
NONE - NONE - SINGLE POLE
3 - THREE-WAY
4 - FOUR-WAY
HP - TOGGLE SWITCH, HORSEPOWER RATED
K - KEY SWITCH
L - LIGHTED HANDLE
P - PILOT LIGHT
T - TIMER SWITCH
TE - MANUAL MOTOR STARTER WITH THERMAL ELEMENT
Y - INDICATES CONTROLLING SWITCH (IF REQUIRED)



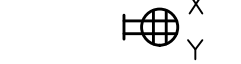
SPECIAL PURPOSE RECEPTACLE AS DEFINED ON PLANS



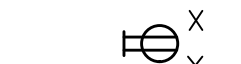
PLUG-IN RECEPTACLE STRIP, QUANTITY AND SPACING OF RECEPTACLES AS NOTED OR SPECIFIED



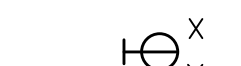
TELECOMMUNICATIONS OUTLET JUNCTION BOX



QUAD-DUPLEX RECEPTACLE, TWO NEMA 5-20R UNDER COMMON COVER PLATE.



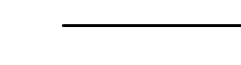
DUPLEX RECEPTACLE, NEMA 5-20R



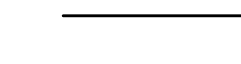
SIMPLEX RECEPTACLE, NEMA 5-20R

SUBSCRIPTS:

- X - INDICATES TYPE
GFCI - GROUND FAULT CIRCUIT INTERRUPTER
Y - INDICATES CIRCUIT NUMBER FROM PANELBOARD



CONDUIT TURNING UP



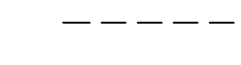
CONDUIT TURNING DOWN



HOME RUN TO PANEL, 2 #12, 1 #12G IN 3/4" UNLESS OTHERWISE NOTED



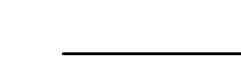
CIRCUIT RUN BETWEEN DEVICES EXPOSED IN NON-ARCHITECTURALLY FINISHED AREAS, CONCEALED IN ARCHITECTURALLY FINISHED AREAS. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT



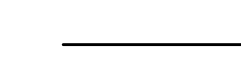
CONDUIT RUN BETWEEN DEVICES CONCEALED IN NON-ARCHITECTURALLY FINISHED AREAS OR UNDER FLOOR SLAB. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT.



CIRCUIT HASH MARKS (WHEN INDICATED), LONG, SHORT, SINGLE DOT AND DOUBLE DOT REPRESENT PHASE, NEUTRAL, EQUIPMENT GROUND AND ISOLATED EQUIPMENT GROUND RESPECTIVELY. #12 IN 3/4" CONDUIT UNLESS OTHERWISE INDICATED



CIRCUIT CONTINUATION



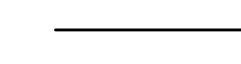
CONDUIT STUBBED OUT AND CAPPED



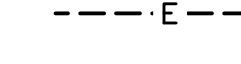
CONDUIT TAG OR CIRCUIT NUMBER - WIRE AND CONDUIT SIZE AS SPECIFIED IN CIRCUIT SCHEDULE ON THE SHEETS



GROUND ROD



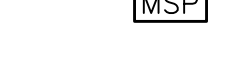
GROUND CABLE



UNDERGROUND ELECTRICAL DUCTBANK



EXISTING UNDERGROUND ELECTRICAL DUCTBANK



MATERIAL STORAGE PANEL

GENERAL NOTES:

- 1. THIS IS A STANDARD ELECTRICAL SYMBOLS SHEET. ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT.
2. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE.

C:\USERS\MARYDROBOW\WORK\DEA17 CHWD\CHWD-ELECTRICAL.DWG

SCALE:

NO SCALE

WARNING 0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED LARRY SMITHEY

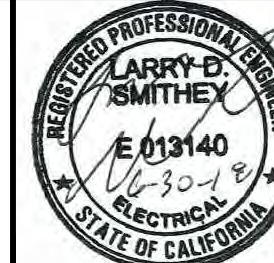
DRAWN MARY HARRINGTON

CHECKED LARRY SMITHEY

DATE 5/3/2017

DOMENICHELLI & ASSOCIATES

1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762 Ph: (916) 933-1997 Fax: (916) 933-4778



BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD.



CORPORATION YARD IMPROVEMENTS

ELECTRICAL LEGEND

DRAWING E1

23 28

LIGHTING SCHEDULE

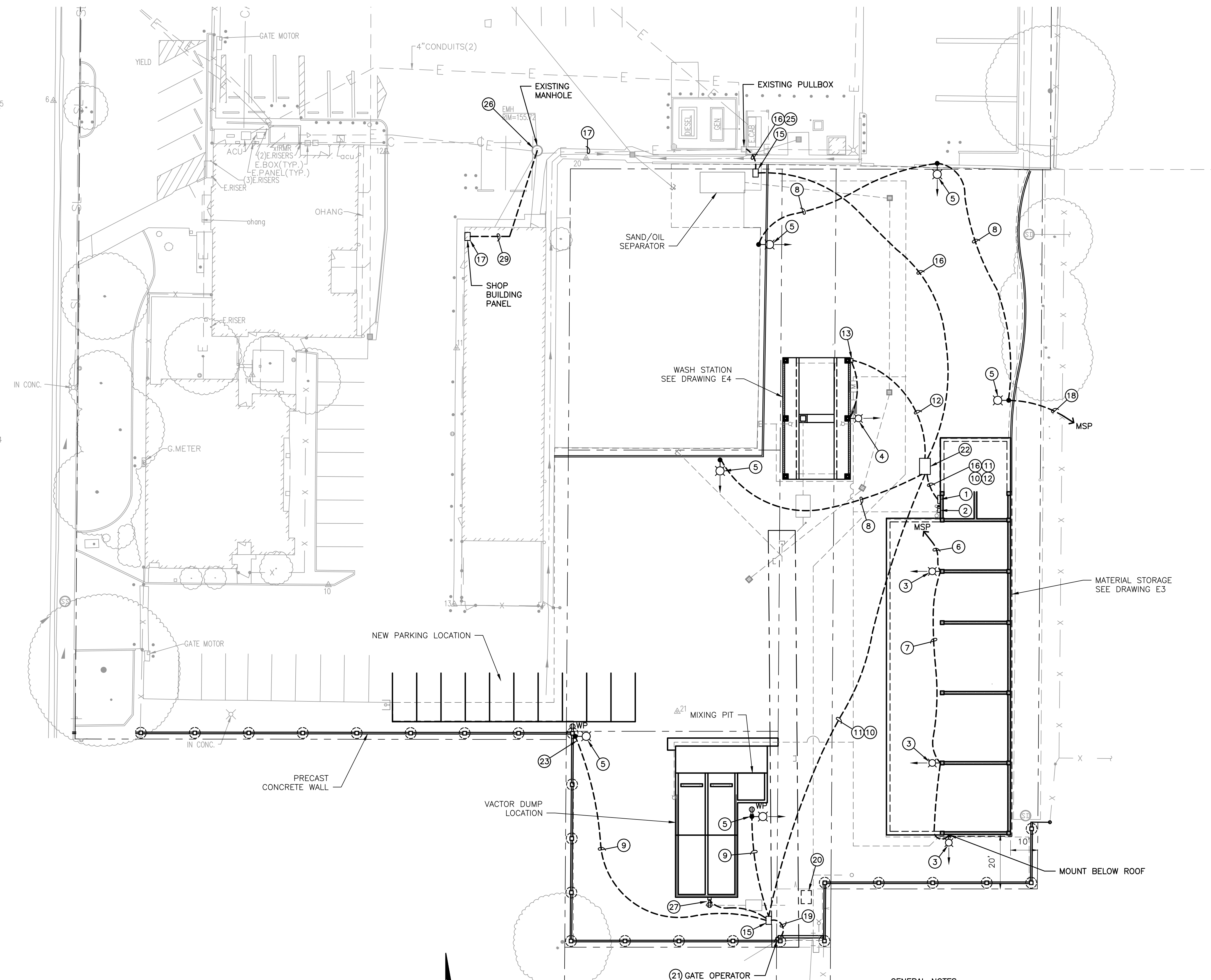
TYPE 1 - AREA LIGHT FIXTURE, LITHONIA D-SERIES LED LUMINAIRE, DSXO-40C-1000-40K-T3M-MVOLT-RPA-HS, ARCYLIC REFLECTOR, POLE MOUNTED (20 FT POLE WITH RECEPTACLE WHERE SHOWN), MOTION SENSOR, HOUSE SHIELD WHERE SHOWN

TYPE 2 - WALL LIGHT FIXTURE, LITHONIA DSXW1LEDD-10C-530-40KOT3S MVOLT, WALL MOUNTED OUTSIDE, MOUNT AT 15', MOTION SENSOR, PHOTOCELL

TYPE 3 - LIGHTING IN STRUCTURES - LITHONIA DMW 2 ENCLOSED AND GASKETED, WET LOCATION, DMW2-L24-4000LM-ACL-WD- MVOLT-FZ1-40K-80CRI

NOTES:

1. INSTALL MATERIAL STORAGE PANEL (MSP), 120/208VOLT ON WALL USING UNISTRUT SUPPORTS.
2. INSTALL OUTDOOR LIGHTING CONTROL ON WALL.
3. MOUNT FIXTURES AT 20' AFG, ATTACH TO METAL BUILDING STRUCTURE AND UNISTRUT (TYPE 2).
4. MOUNT FIXTURE AT 18' AFG, ATTACH TO OUTSIDE OF COLUMN (TYPE 2).
5. POLE MOUNTED FIXTURE, (TYPE 1) (STUB UP SPARE CONDUIT FOR FUTURE CAMERA).
6. 1" C, 2#10, 1#10(G) TO MSP, CKT 3,5 VIA LIGHTING CONTROLLER, 1" C, PW
7. 3/4" C, 2#10, 1#10 (G)
8. 1" C, 2#10, 1#10 (G), 1" C, PW CKT 6, 8 VIA LIGHTING CONTROLLER.
9. 1" C, 4#10, 1#10 (G), LIGHT, RECEPTACLE, 1" C, PW
10. 1" C, 2#10, 1#10 (G) TO MSP, CKT 3,5 VIA LIGHTING CONTROLLER, 1" C, PW
11. 1" C, 6#10, 1#10 (G) TO MSP, CKT 2 (RECP), CKT 4,6 (GATE OPERATOR), 1" C, PW
12. 1" C, 6#10, 1#10 (G) TO MSP, OUTDOOR LIGHTING CIRCUIT CKT 3,5 VIA LIGHTING CONTROLLER, INDOOR LIGHTING CKT 7, RECP CKT 9, 1" C, PW
13. SEE DWG E4 FOR WASH STATION ELECTRICAL
14. SEE DWG E3 FOR MATERIAL STORAGE ELECTRICAL
15. 2'X3' X 2D ELECTRICAL PULLBOX WITH (H2O) TRAFFIC RATED LID.
16. 3" C, 4-2/0, 1#2 (G), 1-2" C, PW, 1-2" C, PW TO MSP
17. INSTALL 4-1/0, 1#2 (G) IN EXISTING CONDUIT TO EXISTING PANEL IN MAINT BUILDING. INSTALL 150 AMP CIRCUIT BREAKER IN SPACE 13, 15 & 17. RELOCATE CB FROM??? 13 TO SPACE 11.
18. 1" C, 2#10, 1#10, 1C, PW TO MSP CKT 8, 13 VIA LIGHTING CONTROLLER
19. 1" C, 3#10, 1#10(G) CKT 4, 6 GATE OPERATOR, 1" C, PW
20. INSTALL TRAFFIC SENSOR LOOP, 4'x4', 3 COILS OF SENSOR CABLE, TAR OVER CABLE TO LEVEL OF PAVEMENT, CONNECT TO GATE CONTROLLER.
21. INSTALL GATE CONTROLLER AND OPERATOR. INSTALL CONDUITS & CONDUCTORS PER MANUFACTURER REQUIREMENTS. FIELD DETERMINE BASED ON CONTRACTOR SUBMITTAL. MOUNT OPERATOR ON 3'x3'x6" CONCRETE PAD.
22. INSTALL 4'x6' PULLBOX WITH SPRING LOADED LID, RATED TRAFFIC, H2O.
23. PROVIDE HOUSE SHIELD
24. INTERCEPT CONDUIT AND INSTALL 2" C, 4-2/0, 1#2 CONDUIT. ROUTE UP AND OVER DOOR INTO PANEL.
25. CONDUIT TO GO UNDER EXISTING CONCRETE DRAIN AND BLOCK FENCE. HAND DIG UNDER DRAIN AND FENCE AND INSTALL. CONDUIT DOES NOT REQUIRE CONCRETE ENCASING FROM PULLBOX TO PULLBOX IN THIS AREA.
26. REQUIRES CONTINUE SPACE ENTRY. CONTRACTOR TO MEET DISTRICT REQUIREMENTS FOR CONFINE SPACE ENTRY.
27. INSTALL PEDESTAL MOUNTED RECEPTACLE (Ø 36" AFG), INSTALL 1" C, 2#12, 1#12(G) TO PULLBOX.

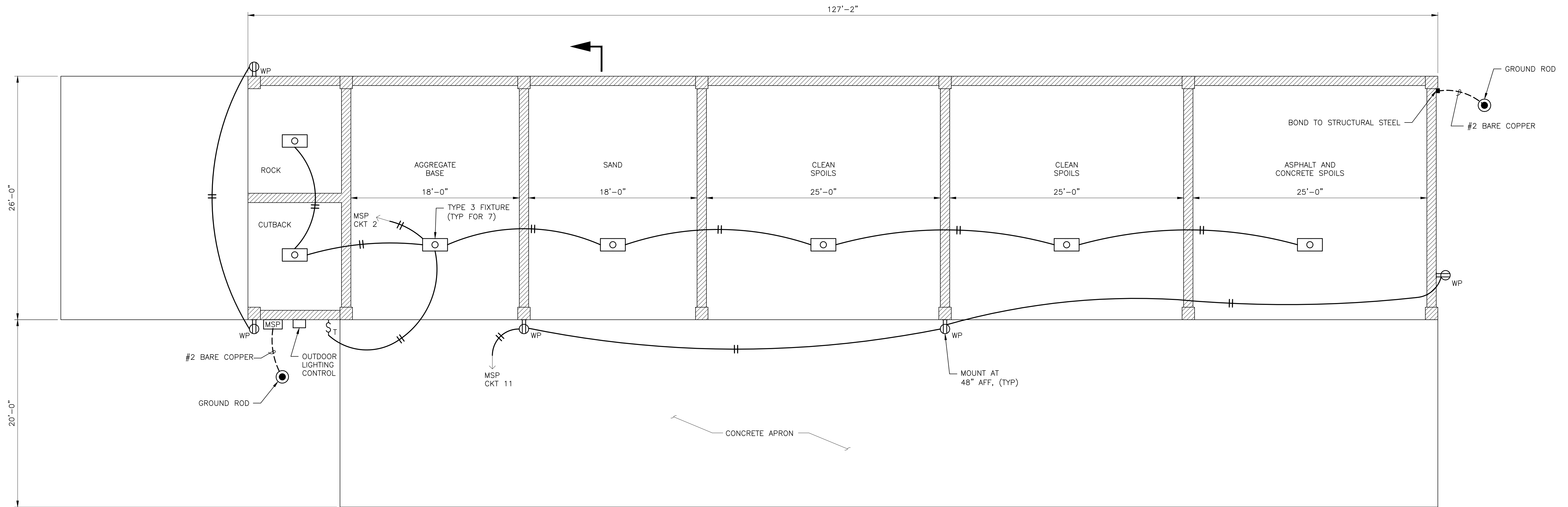


ELECTRICAL SITE PLAN
SCALE: 1" = 20'

GENERAL NOTES:
1. CONCRETE ENCASE ALL CONDUITS.

C:\USERS\MARYDROBOW\WORK\DEA17 CHWD\CHWD-ELECTRICAL-E2.DWG

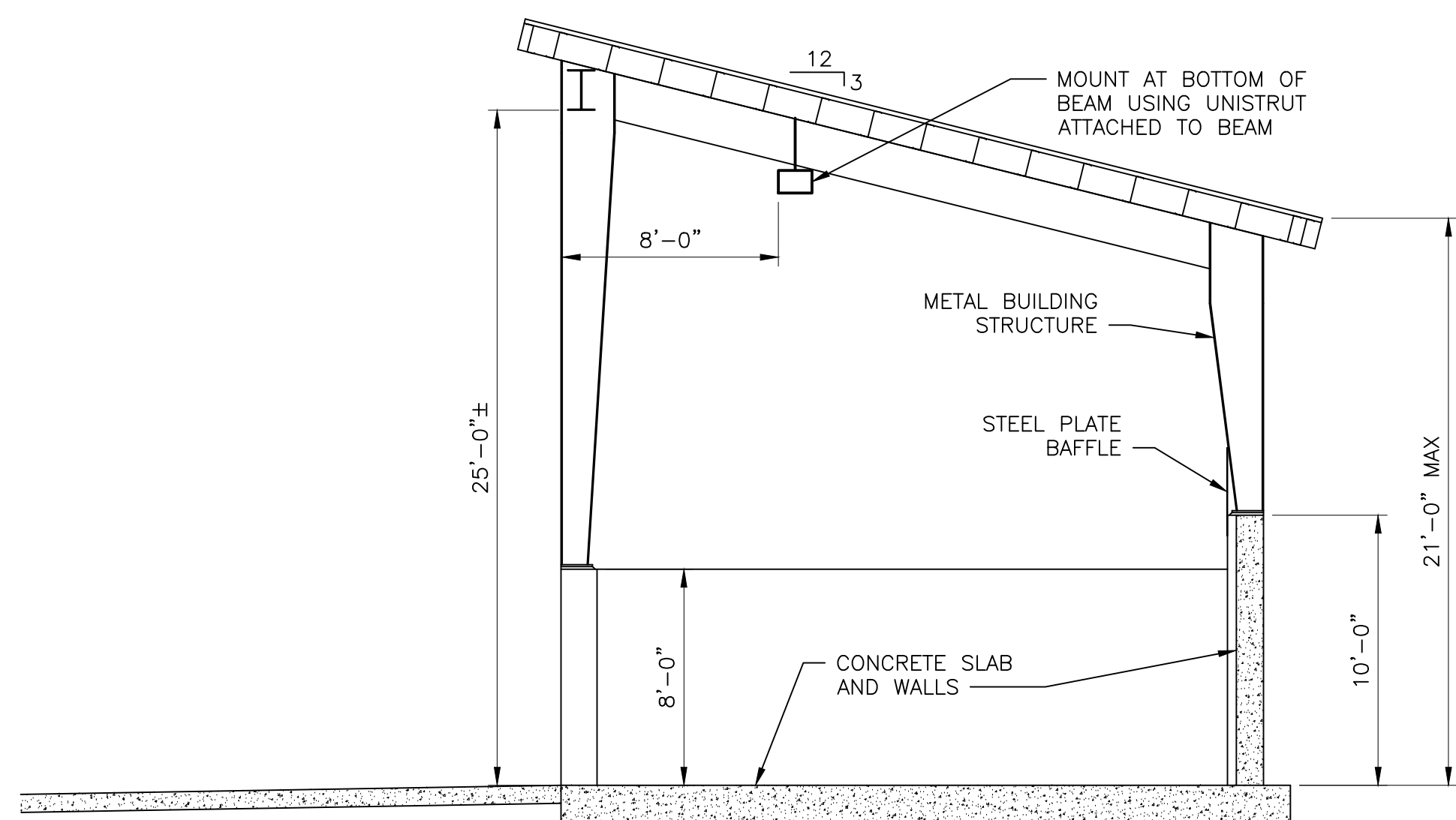
DATE	DESCRIPTION	SCALE: 1"=20'	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DESIGNED LARRY SMITHEY DRAWN MARY HARRINGTON CHECKED LARRY SMITHEY DATE 5/3/2017	DOMENICHELLI & ASSOCIATES 1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762 Ph: (916) 933-1997 Fax: (916) 933-4778	BENCHMARK INFORMATION: A.P.N. 243-0180-005, 006, 007, 009, 011, 046 BENCHMARK NO. 14-61 ELEV. 163.13 7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD.	 6230 Sylvan Rd, Citrus Heights, CA 95610	CORPORATION YARD IMPROVEMENTS		DRAWING E2
		ELECTRICAL SITE AND LIGHTING PLAN		24				28		



MATERIAL STORAGE

PLAN

3/16"=1'-0"



MATERIAL STORAGE

SECTION A

3/16"=1'-0"

C:\USERS\MARY\DRAWING\WORK\DEA17 CHWD\CHWD-ELECTRICAL.DWG

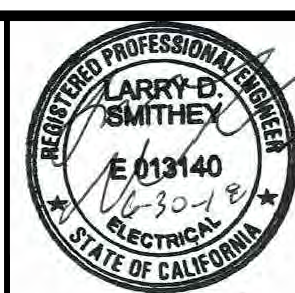
DATE	DESCRIPTION

SCALE:
3/16"=1'-0"

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED LARRY SMITHEY
DRAWN MARY HARRINGTON
CHECKED LARRY SMITHEY
DATE 5/3/2017

DOMENICHELLI & ASSOCIATES
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El Dorado Hills, CA 95762
Ph: (916) 933-1997
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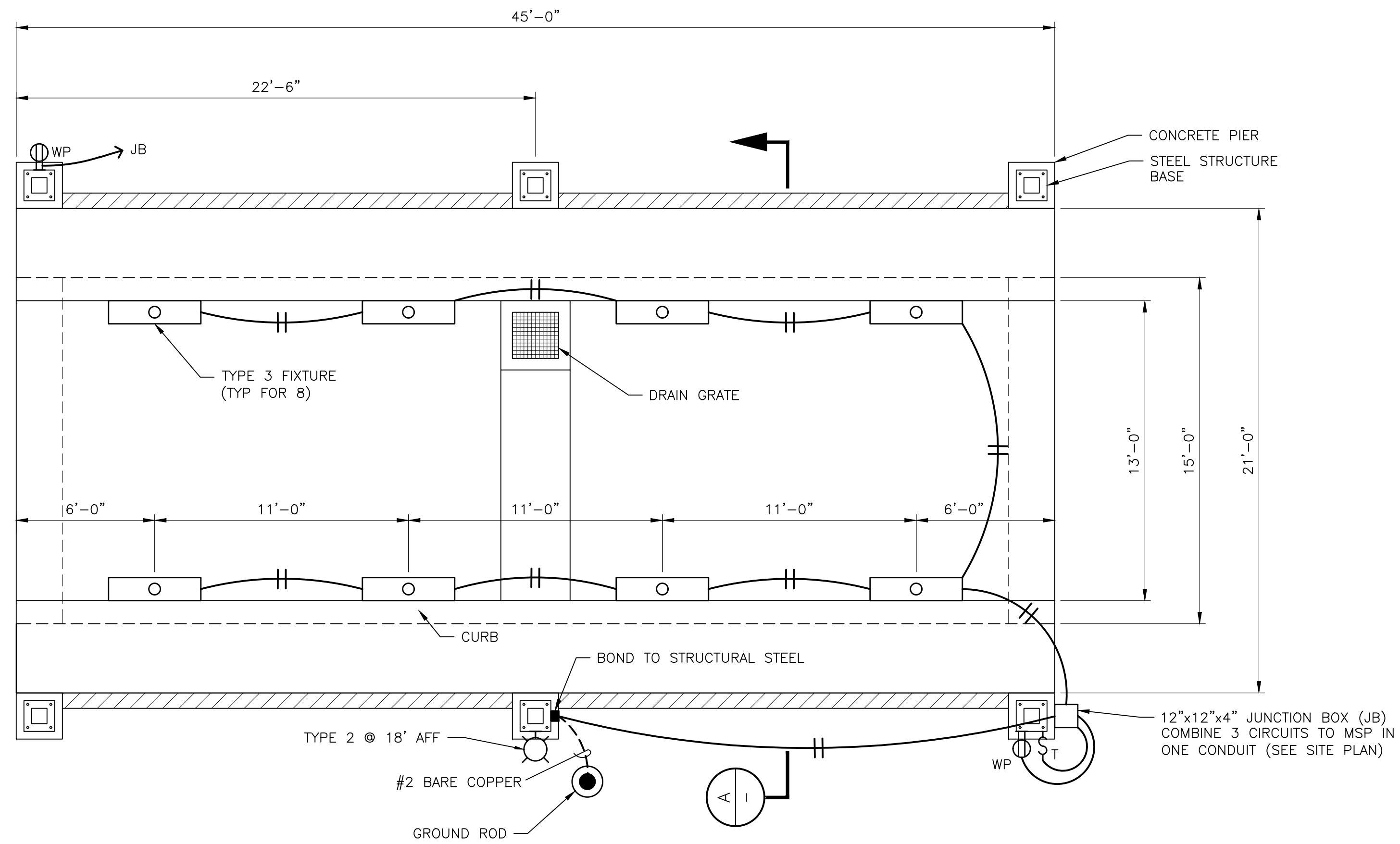
BENCHMARK INFORMATION:
A.P.N. 243-0180-005, 006, 007, 009, 011, 046
BENCHMARK NO. 14-61 ELEV. 163.13
7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD.



CORPORATION YARD IMPROVEMENTS

**MATERIAL STORAGE
ELECTRICAL PLAN & SECTION**

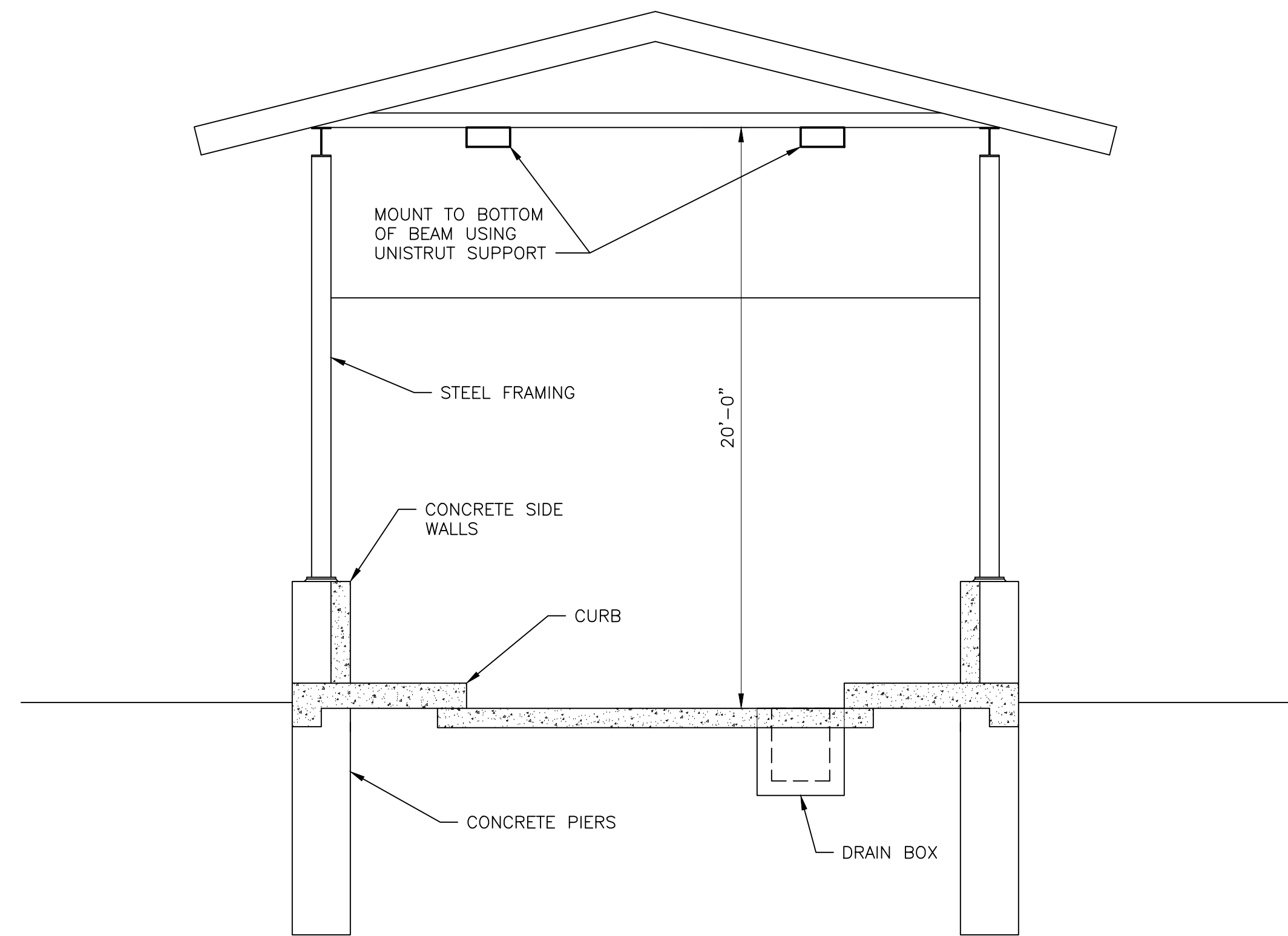
DRAWING E3	
25	28



WASHDOWN STATION

PLAN

1/4" = 1'-0"



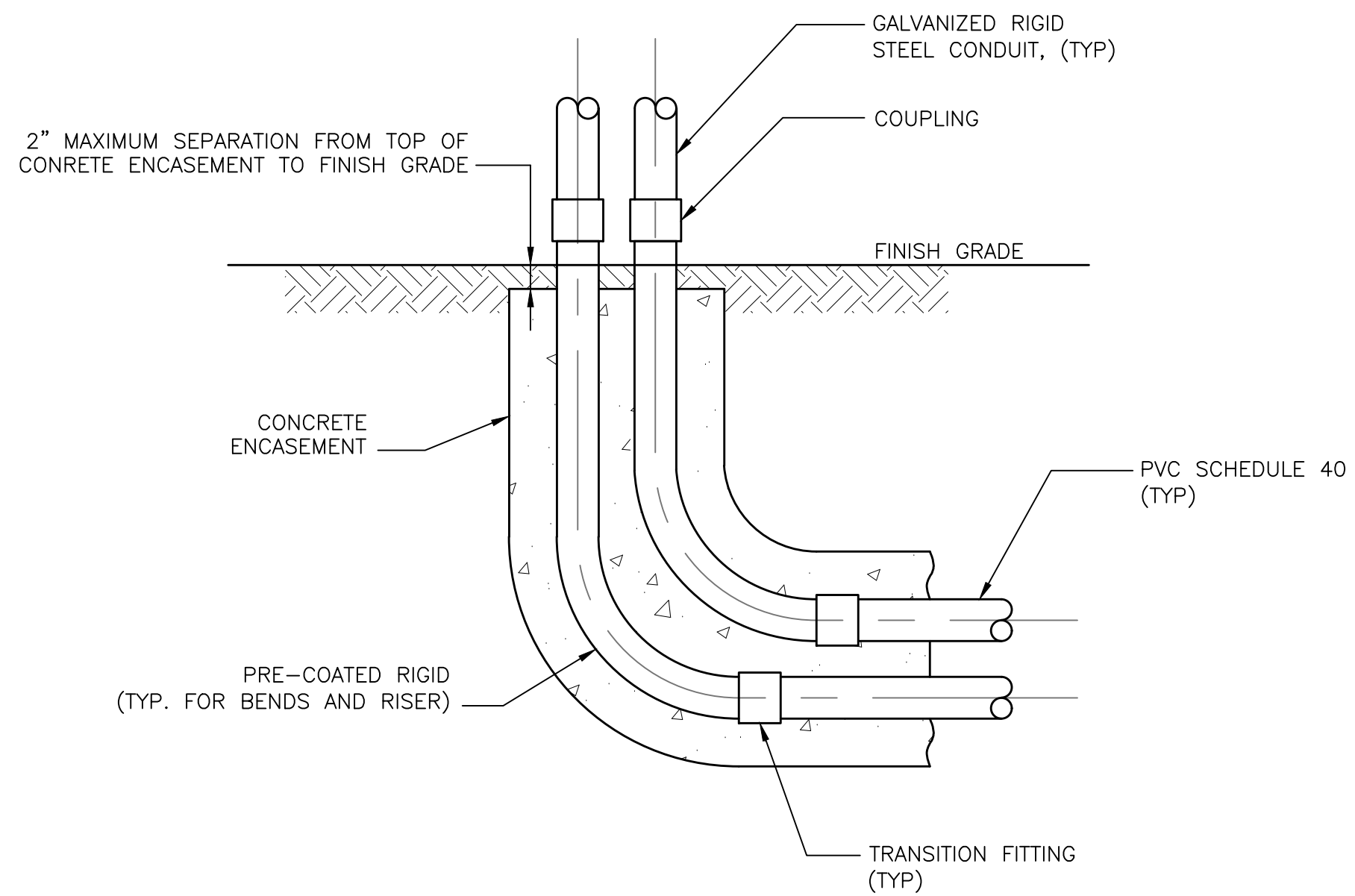
WASHDOWN STATION

SECTION $\frac{A}{-}$

1/4" = 1'-0"

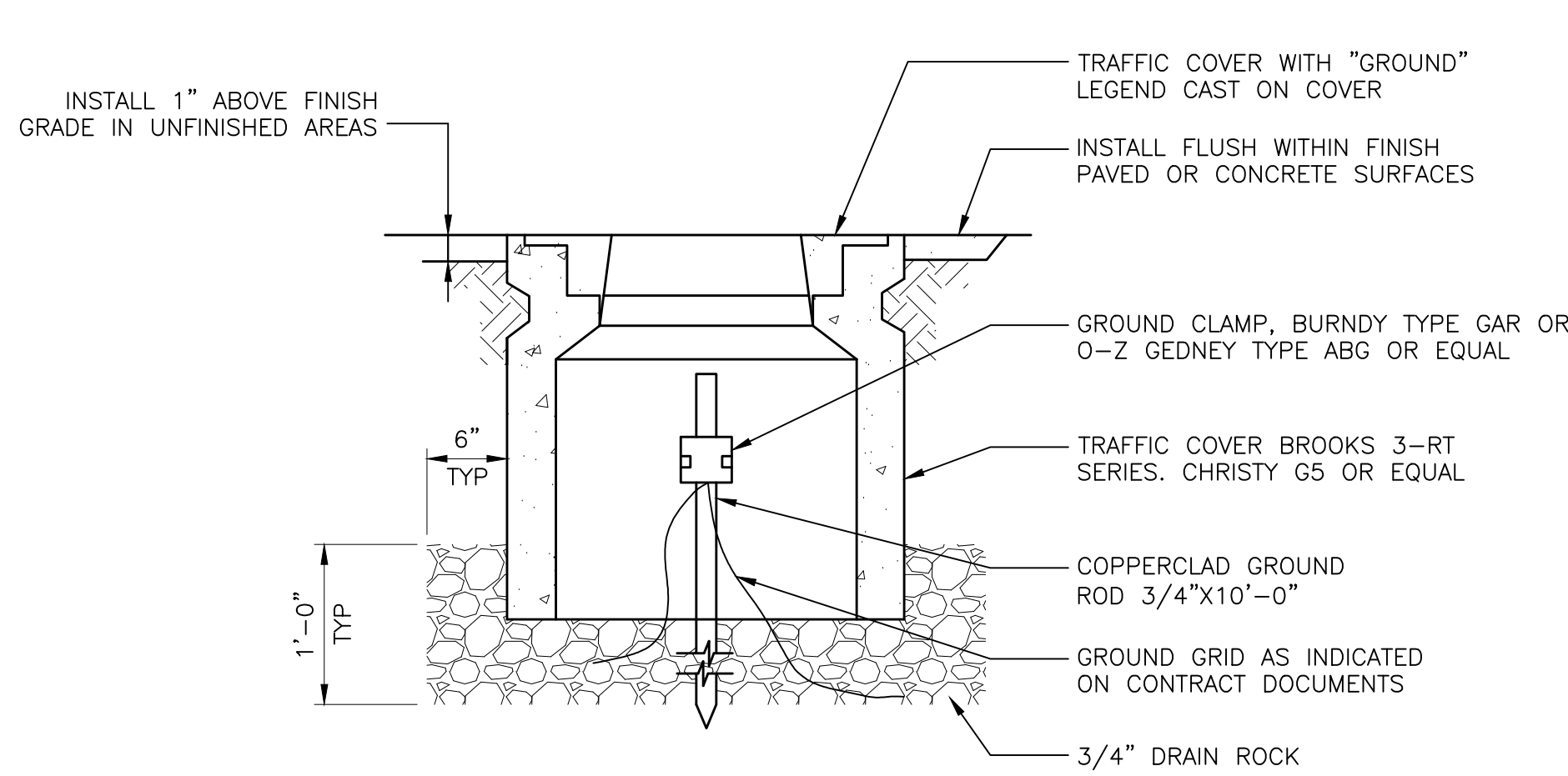
C:\USERS\MARY\PROBOX\WORK\DEA17 CHWD\CHWD-ELECTRICAL.DWG

DATE	DESCRIPTION	SCALE: 1/4" = 1'-0"	<p>WARNING</p> <p>0 1/2 1</p> <p>IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.</p>	DESIGNED LARRY SMITHEY	<p>DOMENICHELLI & ASSOCIATES</p> <p>1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762</p> <p>Ph: (916) 933-1997 Fax: (916) 933-4778</p>	<p>BENCHMARK INFORMATION:</p> <p>A.P.N. 243-0180-005, 006, 007, 009, 011, 046</p> <p>BENCHMARK NO. 14-61 ELEV. 163.13</p> <p>7/8" METAL DISC STAMPED "CO. B.M. 14-61" LOCATED IN CHISELED SQUARE IN TOP OF VERTICAL CURB ABOVE D.I. N END OF CURB RETURN AT THE NORTHWEST CORNER OF GREENBACK LANE & SYLVAN RD.</p>	<p>CITRUS HEIGHTS WATER DISTRICT</p> <p>6230 Sylvan Rd, Citrus Heights, CA 95610</p>	CORPORATION YARD IMPROVEMENTS		DRAWING E4	
				DRAWN MARY HARRINGTON				CHECKED LARRY SMITHEY	DATE 5/3/2017	WASHDOWN STATION ELECTRICAL PLAN & SECTION	



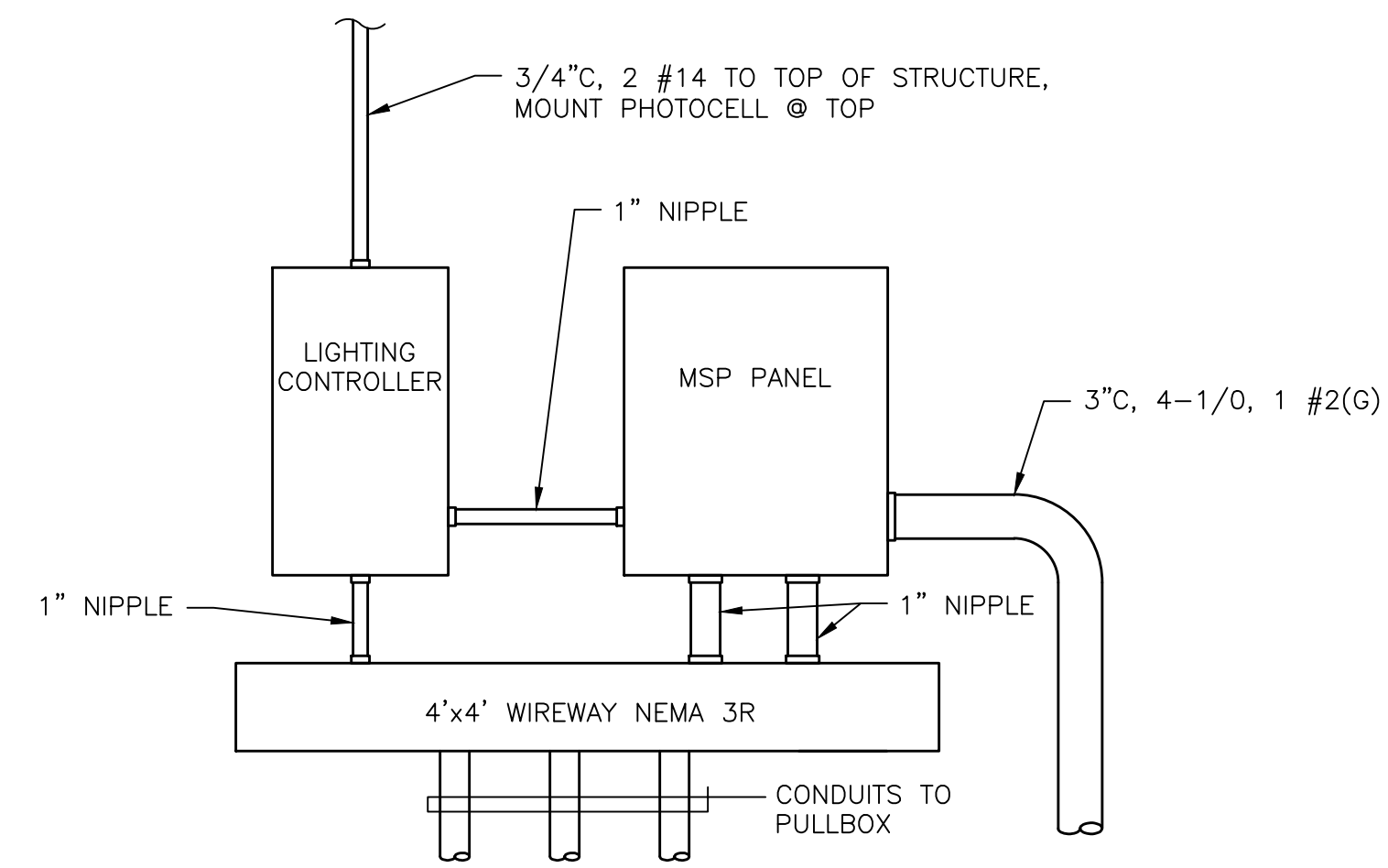
CONDUIT RISER FROM GROUND DETAIL

NTS



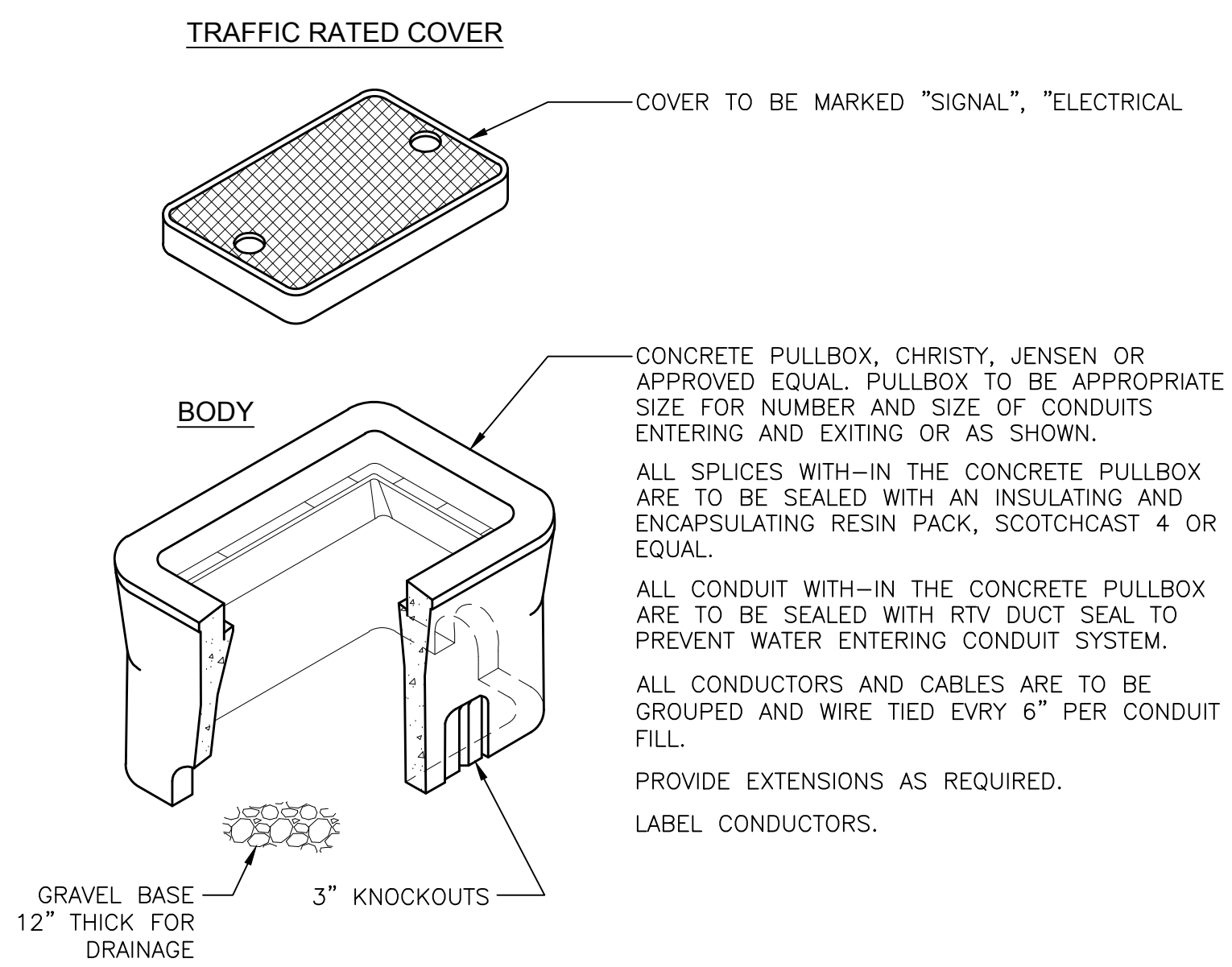
GROUND WELL DETAIL

NTS



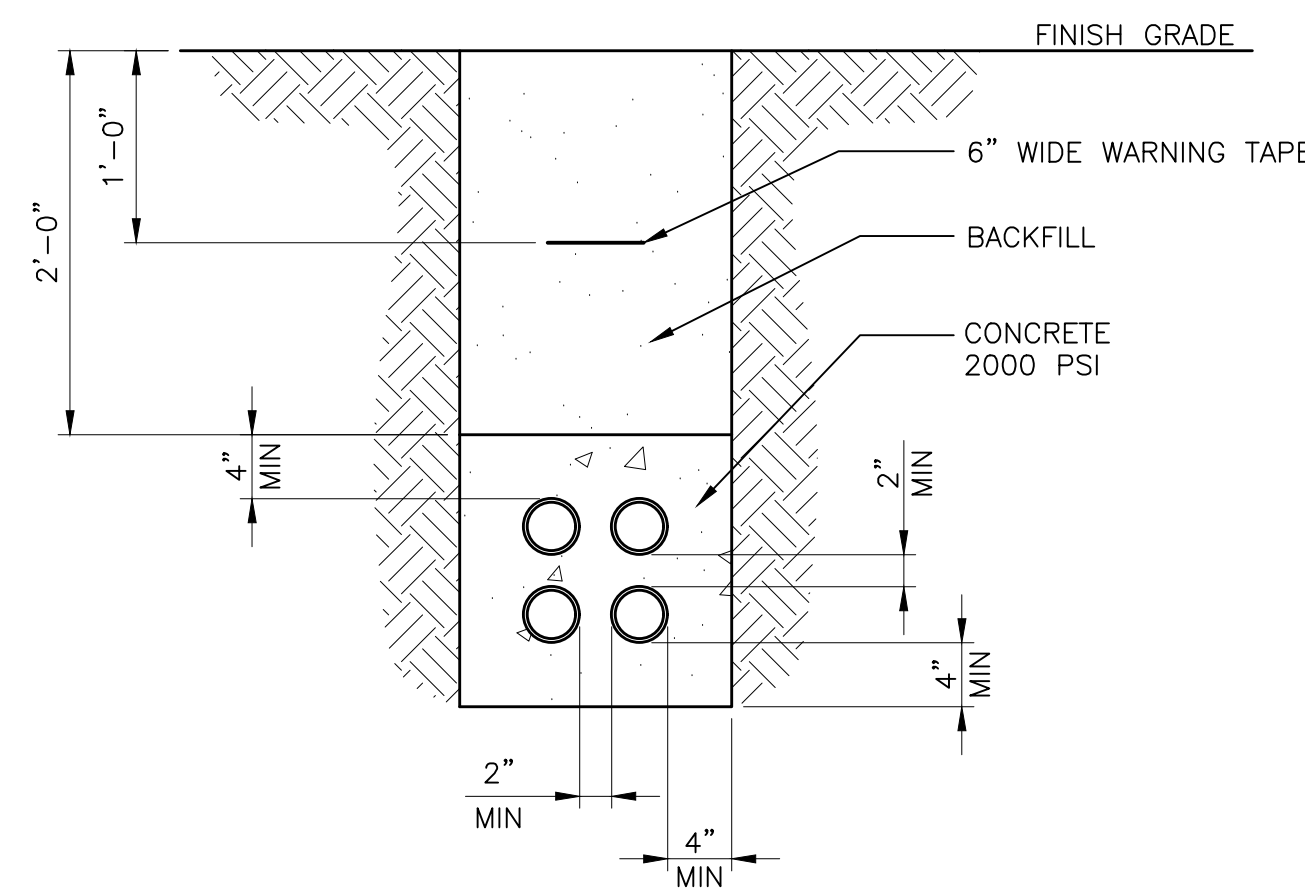
PANEL ELEVATION

NTS



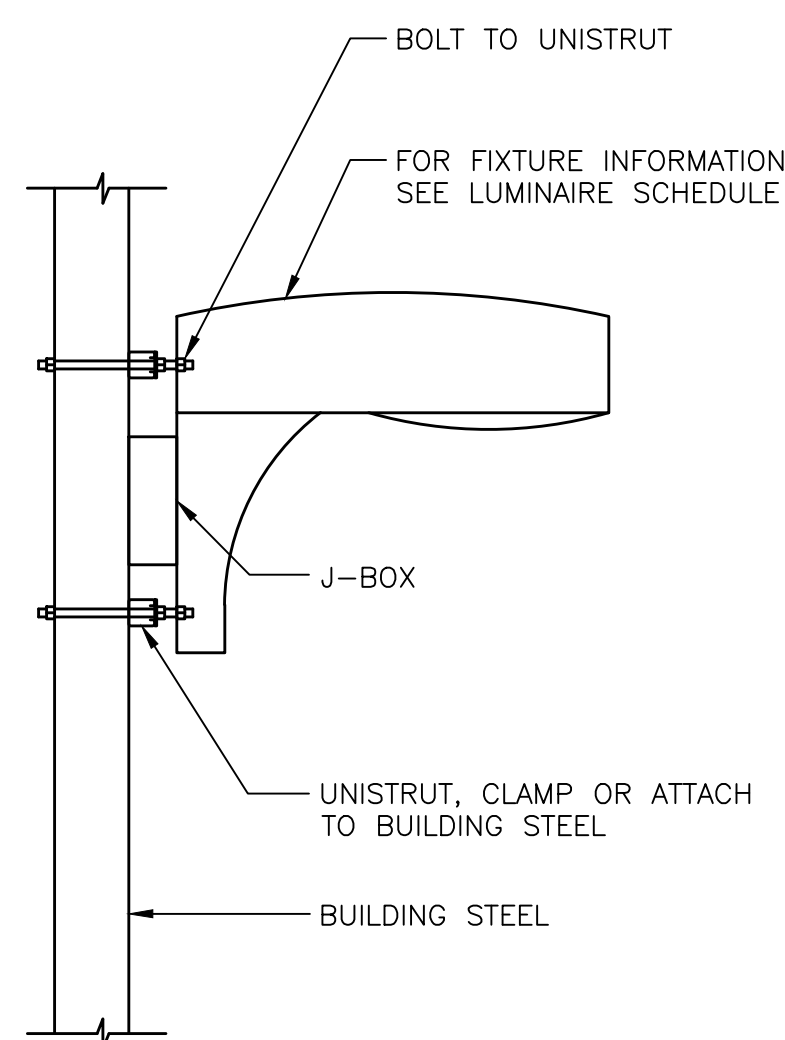
H2O RATED CONCRETE PULLBOX DETAIL

NTS



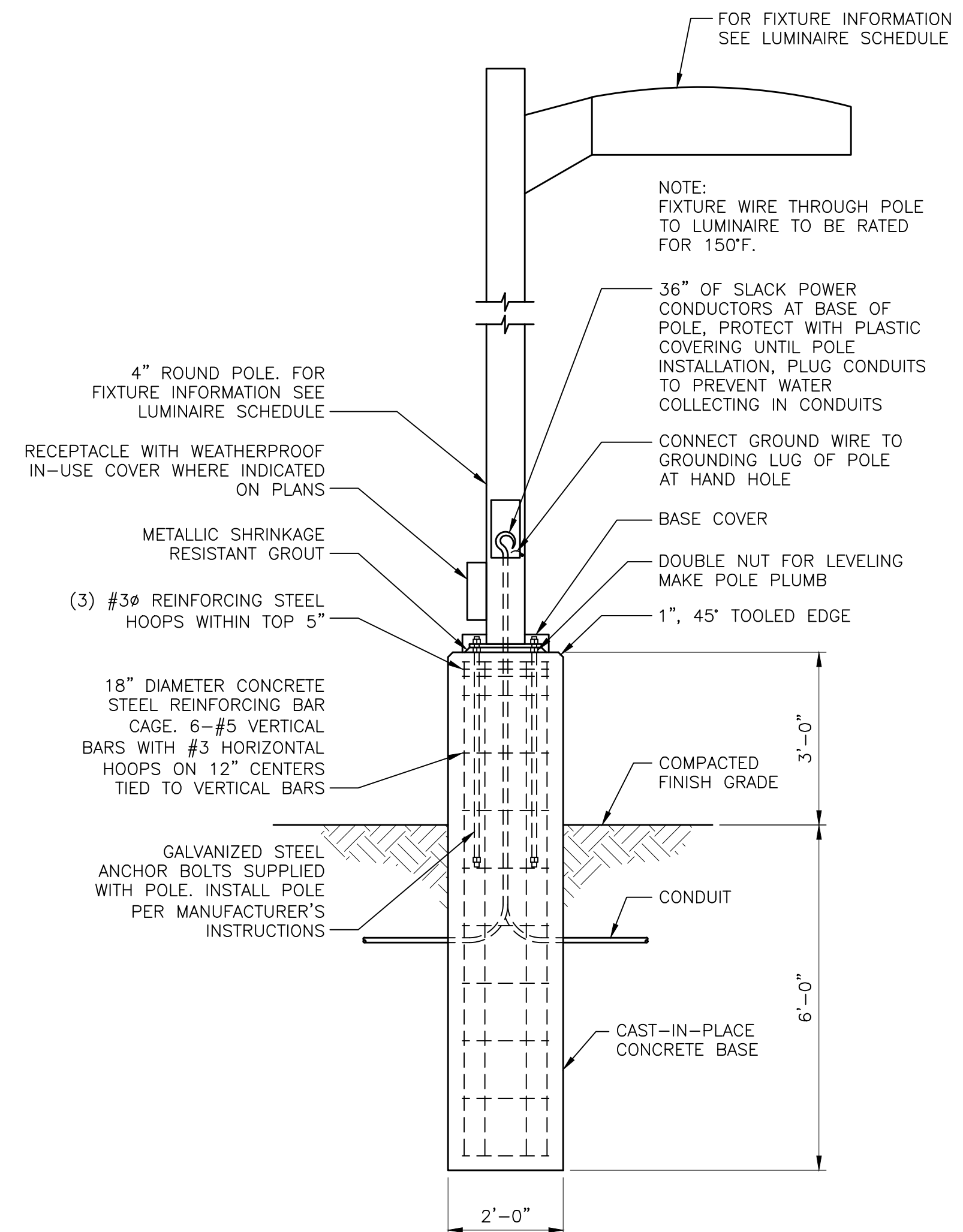
DUCT BANK SECTION

NTS



LUMINAIRE MOUNTING DETAIL

NTS



POLE MOUNTED FIXTURE MOUNTING DETAIL

NTS

C:\USERS\MARYDROPOBOX\WORK\DEA17 CHWD\CHWD-ELECTRICAL.DWG

DATE	DESCRIPTION

SCALE: AS SHOWN	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DESIGNED LARRY SMITHEY DRAWN MARY HARRINGTON CHECKED LARRY SMITHEY DATE 5/3/2017
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DOMENICHELLI & ASSOCIATES

1101 Investment Blvd, Suite 115 El Dorado Hills, CA 95762 Ph: (916) 933-1997 Fax: (916) 933-4778

LARRY E. SMITHEY
REGISTERED PROFESSIONAL ENGINEER
E 013140
STATE OF CALIFORNIA

BENCHMARK INFORMATION:
A.P.N. 243-0180-005, 006, 007, 009, 011, 046
BENCHMARK NO. 14-61 ELEV. 163.13
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CITRUS HEIGHTS WATER DISTRICT

6230 Sylvan Rd, Citrus Heights, CA 95610

CORPORATION YARD IMPROVEMENTS		DRAWING E5
ELECTRICAL DETAILS I		27 28

ATTACHMENT 3

Contract Amendment with Domenichelli & Associates

**FIRST AMENDMENT TO
PROFESSIONAL SERVICES AGREEMENT

BETWEEN THE CITRUS HEIGHTS WATER DISTRICT
AND
DOMENICHELLI AND ASSOCIATES, INC.**

1. PARTIES AND DATE.

This First Amendment to the Professional Services Agreement (“Amendment”) is made and entered into this ____th day of July, 2017 by and between the Citrus Heights Water District (“District”) and Domenicelli and Associates, Inc. (“Consultant”) are sometimes individually referred to as “Party” and collectively as “Parties” in this Amendment.

2. RECITALS.

2.1 Agreement. District and Consultant entered into that certain Professional Services Agreement dated October 12, 2016 (“Agreement”), whereby Consultant agreed to provide engineering consultant services.

2.2 Amendment. District and Consultant desire to amend the Agreement for the first time to provide for an additional scope of services and to provide for additional compensation for such services.

3. TERMS.

3.1 Compensation. Section 3.2 of the Agreement is amended to read in full as follows:

Maximum Amount. The maximum amount payable under the terms of this Agreement, including expenses, will not exceed \$250,000.00. Consultant shall promptly notify District, in writing, when fees and expenses incurred under this Agreement have reached \$200,000.00 (80% of maximum amount allowable). Consultant shall concurrently inform District of Consultant’s estimate of total expenditures required to complete its current assignments before proceeding, when the remaining work would exceed the maximum amount payable.

3.2 Exhibits. Exhibit “A” of the Agreement is hereby amended to add the Scope of Work attached hereto as Exhibit “1.” Such services shall be in addition to the services outlined in the prior Exhibit “A” of the Agreement.

3.3 Continuing Effect of Agreement. Except as amended by this Amendment, all provisions of the Agreement shall remain unchanged and in full force and effect. From and after the date of this Amendment, whenever the term “Agreement” appears in the Agreement, it shall mean the Agreement as amended by this Amendment.

3.4 Adequate Consideration. The Parties irrevocably stipulate and agree that they have each received adequate and independent consideration for the performance of the obligations they have undertaken pursuant to this Amendment.

3.5 Counterparts. This Amendment may be executed in duplicate originals, each of which is deemed to be an original, but when taken together shall constitute but one and the same instrument.

IN WITNESS WHEREOF, the Parties have entered into this First Amendment to Professional Services Agreement as of the ____th day of July, 2017.

CITRUS HEIGHTS WATER DISTRICT

By: _____
Hilary Straus
General Manager

DOMENICHELLI AND ASSOCIATES, INC.

By: _____
Sara Rodgers, P.E.
Vice President

**EXHIBIT “1”
ADDITIONAL SERVICES**



DOMENICHELLI AND ASSOCIATES, INC.
CIVIL ENGINEERING

July 19, 2017

Paul Dietrich
Project Manager
Citrus Heights Water District
6230 Sylvan Road
Citrus Heights, CA 95610

Subject: Corporation Yard Improvements Project Amendment Request

Dear Paul,

We are requesting an amendment to our original contract due to additional efforts during bidding and anticipated during construction. The added efforts and tasks include

Work that would be considered outside of our original scope of services includes:

1. Construction Management and Coordination – Project scope increases, including the addition of the sewer pipeline work as a result of discovery and expansion of the project area, require added coordination during construction. This will include the need for additional meetings and scheduling of inspections.
2. Waterline Staking – Area West will provide staking services for the water pipeline to be constructed by District staff.
3. SWPPP QSD Services – During construction of the project the District has requested that Domenichelli and Associates provide oversight and guidance related to storm water BMPs. Domenichelli and Associates will provide Qualified Storm Water Pollution Prevention Plan Developer services including assistance with any state reporting required during the project construction.

We are requesting an increase in budget based on the attached breakdown of hours attached.

This amendment would increase the total budget by \$28,510.

Please let me know if you have any questions. If our request for additional budget meets your approval, we will proceed upon your authorization based on our engineering services agreement.

Sincerely,

A handwritten signature in black ink, appearing to read 'Sara Rogers', is written over a light blue horizontal line.

Sara Rogers, PE
Domenichelli & Associates, Inc.



DOMENICHELLI AND ASSOCIATES, INC.
CIVIL ENGINEERING

CORPORATION YARD IMPROVEMENTS PROJECT									
CITRUS HEIGHTS WATER DISTRICT									
AMENDMENT Fee Breakdown									
Task Description	PM	D&A		Pete	Total D&A	Area	Expense	Totals	
		CM	PE	DFT/EIT					
	SR	TD	AM	JC		Surveying			
rates/hr	150	135	105	90					
6 Services During Construction									
a Construction Management/Coordination	32	60	24		\$ 15,420			\$ 15,420	
f Project Completion	8	16	8		\$ 4,200			\$ 4,200	
g Waterline Staking	8				\$ 1,200	\$ 3,250		\$ 4,450	
h SWPPP QSD Services	24		8		\$ 4,440			\$ 4,440	
Subtotal Task 6	72	76	40		\$ 25,260	\$ 3,250	\$ -	\$ 28,510	
TOTAL	72	76	40	0	\$ -	\$ 3,250	\$ -	\$ 28,510	