

City of Turlock
City Project No. 20-027 "City-Wide Chlorination"

ADDENDUM NO. 3

TO CONTRACT DOCUMENTS

FOR: CITY OF TURLOCK
CITY PROJECT NO. 20-027 "CITY-WIDE CHLORINATION"

November 17, 2020

NOTICE TO BIDDERS

This Addendum is attached to and made a part of the above-entitled Contract Documents for the City of Turlock.

This **Addendum No. 3** consists of 44 pages.

Response to Bidder's Questions

Question No. 1: It is our opinion the time allotted is not sufficient to complete the work and the liquidated damages are too high for this project. We request an additional 60 working days and reducing the LD's to \$2,000 for substantial completion.

Answer No. 1: Refer to Addendum 1, Revision Item 1. The substantial completion date only applies to the improvements at three locations: Well #4, Well #29, and Well #25. The improvements at all other sites shall be completed by the final completion date. Refer to Revision Item 1 of this Addendum.

Question No. 2: Please refer to the Specs cover for the Technical Specs, see below. Please confirm this is for construction.

Answer No. 2: The Technical Specs will be used for construction. Prior to the Notice to Proceed a Conformed Set for Construction Specification Set will be issued that incorporates all Addenda.

Question No. 3: Please provide spec 03 20 00 Concrete Reinforcement, referenced in Specification 03 30 10-3

Answer No. 3: Refer to Revision Item 2 in this Addendum.

City of Turlock
City Project No. 20-027 "City-Wide Chlorination"

Question No. 4: Please provide the size of the existing water distribution pipe at each site where we are to connect for Site Utility Water per Detail W-10/D-5.

Answer No. 4:

**Chlorination Project
Approximate Site Pipe Sizes**

Location	Above Grade Pipe Diameter (Inches)	Below Grade Pipe Diameter (Inches)
D ST TANK	14"	N/A
FULKROTH TANK	14"	N/A
KILROY TANK	14"	N/A
WELL 13	10"	10"
WELL 15	10"	10"
WELL 20	12"	12"
WELL 22	12"	10"
WELL 24	10"	10"
WELL 27	14"	16"
WELL 30	12"	12"
WELL 31	12"	12"
WELL 32	12"	12"
WELL 33	14"	14"
WELL 34	10"	10"
WELL 36	12"	12"
WELL 37	18"	18"
WELL 39	10"	10"
WELL 40	12"	12"

Question No. 5: Please provide the size of the existing water distribution pipe at each site where we are to connect a chemical injection assembly per Detail 1/D-3.

Answer No. 5: See response to Question 4 in this Addendum.

Question No. 6: The Piping Legend for each site indicates that the 1" Site Utility Water piping is HDPE. The Chemical Storage Enclosure Plan per Detail 1/D-1 indicates that this same piping is 1" copper to the emergency eye wash and analyzer and the below grade pipe is SCH 80 PVC. Please provide clarification on the pipe material for the buried Site Utility Water piping as well as the material for the exposed Site Utility Water piping inside the Chemical Storage Enclosures.

City of Turlock

City Project No. 20-027 "City-Wide Chlorination"

Answer No. 6: *Both PVC and HDPE shall be acceptable for below grade piping site utility water. Both Copper and Galvanized shall be acceptable for above grade piping site utility water.*

Question No. 7: *Please confirm that the 1" site utility line and the 1" analyzer sample line are the same line coming from the well discharge past the chlorine injection routed back to the chem feed room then branching off to the eyewash shower, hose bib and the analyzer panel in the enclosure?*

Answer No. 7: *Confirmed.*

Question No. 8: *Please confirm if the water meter is required for the line mentioned above and shown on W-10, W-11, and W-13 on D-10. If it is required do you need one at both W-10/W-11 and W-13?*

Answer No. 8: *Confirmed and only one water meter is required per site.*

Question No. 9: *Please refer to the pipelines (chemical conduit, sample, water) that are routed within the existing buildings at the well sites and the tank sites. How will these pipelines be routed? Below the existing slab, up in the existing ceiling area, along the walls, or other?*

Answer No. 9: *Refer to Revision Item 3 in this Addendum.*

Question No. 10: *There is no specification for the masonry (CMU) work, please provide.*

Answer No. 10: *Refer to Addendum 2, Revision Item 3.*

Question No. 11: *Please refer to the plan view 1/D-1 dimension of 10'-8" and front elevation 2/D-1 dimension of 11'-4" for the chemical enclosure, which dimension is correct*

Answer No. 11: *Refer to Revision Item 3 in this Addendum.*

Question No. 12: *Please refer to the chemical storage enclosure plan on D-1 referring to the full width locking double leaf swing gate. Please provide more details and specifications for this gate.*

City of Turlock
City Project No. 20-027 "City-Wide Chlorination"

Answer No. 12: Refer to Revision Item 3 in this Addendum.

Question No. 13: Please provide spec for composite shingle roofing at enclosures.

Answer No. 13: Refer to Revision Item 2 in this Addendum.

Question No. 14: Requesting approval of chemical metering pump Model Proteus series by Milton Roy.

Answer No. 14: The Proteus series shall not be considered an equal to the Grundfos pumps specified for this project.

Question No. 15: In reading the specs., it looks like the analyzers included in this project will be the amperometric chlorine and the pH sensor. I wanted to mention that the amperometric chlorine analyzer that fulfills the spec. requirements includes a pH probe. You can output the individual pH and temperature reading from the chlorine analyzer, in addition to the chlorine reading. Did you still need the separate pH probe in addition to the one included with the CL10 (as described above)?

Answer No. 15: The HACH CLF10sc shall have a pH sensor in the flow cell to provide pH compensated free chlorine measurement without the use of a buffer per Specification 40 50 30.

Question No. 16: Please refer to the analyzer panel on D-6. The thickness seems of PL 1/2 to be only applicable if you use Polymer Panel. For SS Panel of PL 1/2 x 4' x 6', it weighs 1,225 pounds for the panel alone. We believe Unistrut won't be able to support the panel as shown. Please advise what thickness of SS PL this should be based on.

Answer No. 16: Refer to Revision Item 3 in this Addendum.

Question No. 17: Just to clarify they are calling out for 18 sodium hypochlorite Duplex DDA dosing skids? Is it calling for 9 Skids equaling 18 Pumps, or 18 Skids equaling 36 pumps?

Answer No. 17: Refer to Design Criteria Sheet G-5. 18 pumps on 18 skids shall be provided.

City of Turlock
City Project No. 20-027 "City-Wide Chlorination"

Revisions to Plans and Specifications

The following additions, deletions or modifications shall become part of the Contract Documents:

Strikethrough text (~~text~~) indicates deletions.

Bold Italicized text (***text***) indicates additions.

ITEM NO. 1:

Revise Agreement as follows:

- 5.** Time for Performance.
The time fixed for the commencement of work under the Contract is within ten (10) working days after the Notice to Proceed has been issued. The ~~project~~ **improvements at Well #4, Well #29, and Well #25** shall be substantially complete before the expiration of one hundred nine (109) working days (the "Substantial Completion Date") beginning on the first day of work or no later than the tenth day after the Notice to Proceed has been issued. Substantial Completion is defined herein as the time at which the work **at Well #4, Well #29, and Well #25** has progressed to the point where, in the opinion of Engineer, the work is sufficiently complete such that the improvements may be utilized for the purposes for which it is intended, including successful completion of all required testing periods. All contract work, including **all other well sites and** punch list items not necessary for substantial completion, shall be complete before the expiration of one hundred thirty (130) working days (the "Final Completion Date") beginning on the first day of work or no later than the tenth day after the Notice to Proceed has been issued. The Substantial Completion Date and the Final Completion Date are collectively referred to herein as the "Completion Dates."
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ITEM NO. 2:

Add the following attached specification sections to the Project Specifications:

03 20 00	CONCRETE REINFORCEMENT
07 31 13	ASPHALT SHINGLES
07 62 00	SHEET METAL FLASHING AND TRIM

ITEM NO. 3:

Replace the following revised sheets with the attached and incorporate into the Project Plan Set:

City of Turlock
City Project No. 20-027 "City-Wide Chlorination"

G1	COVER SHEET
G3	GENERAL NOTES
D-1	CHLORINATION ENCLOSURE DETAILS
D-2	CHLORINATION ENCLOSURE DETAILS
D-6	SAMPLING STATION DETAILS
D-8B	STRUCTURAL DETAILS
D-8D	STRUCTURAL DETAILS (NEW SHEET)

ITEM NO. 4:

Revise Specification 03 15 20 Anchor Bolts & Post Installed Anchors as follows:

2.1 Materials

B. Anchor bolts, threaded rod anchors, expansion bolts and adhesive anchors for buried service, splash zones, and immersion service shall be stainless steel. Anchor bolts, threaded rods and adhesive anchors for exterior use shall be hot dipped galvanized. Zinc coated expansion anchors shall not be used for buried, splash zone, immersion or exterior service.

~~B. Anchor bolts and threaded rod anchors for buried service and in splash zones shall be stainless steel. Anchor bolts, threaded rod anchors, and expansion anchors for immersion service shall be stainless steel. Expansion anchors for buried service and in splash zones shall be stainless steel. All other anchor bolts, threaded rod anchors, and expansion anchors shall be galvanized steel unless otherwise specified or indicated on the Plans.~~

3.3 ADHESIVE ANCHORS

A. Adhesive anchors shall be installed in conformity with the manufacturer's instructions and ICC Evaluation Service Report recommendations. Anchors must be installed in holes drilled using carbide-tipped drill bits or diamond core drill bits. Should diamond core drill bits be used, the manufacturer's roughening tool must be used in conjunction with the bit.

ITEM NO. 5:

Replace Specification Section 03 30 10 Concrete Site Work with revised version attached.

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Work required under this section consists of furnishing all materials, supplies, equipment, tools, transportation, and facilities, and performing all labor and services incidental to furnishing and installing concrete reinforcing work as described in this section of the Specifications, shown on the accompanying Plans, or reasonably implied therefrom, except as hereinafter specifically excluded. The work shall include, but is not necessarily limited to:
 - 1. Provide reinforcing work, complete as indicated, specified and required.
 - 2. Furnishing and placing bar and wire reinforcement for cast-in-place concrete.

1.2 RELATED WORK

- A. Section 03 11 00 – Concrete Formwork
- B. Section 03 30 10 – Concrete Site Work
- C. Section 03 33 15 – Concrete Sidewalk, Curb, & Gutter

1.3 REFERENCES

- A. Industry Codes and Standards
 - 1. American Society for Testing and Materials (ASTM)
 - a. A1064/A1064M Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
 - b. A615/A615M Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - c. ASTM A706 - Specification for Deformed and Plain Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
 - 2. California Building Code (CBC)
 - 3. Concrete Reinforcing Steel Institute (CRSI)
 - a. Manual of Standard Practice (CRSI Manual)
 - 4. American Concrete Institute (ACI)
 - a. ACI 301 Specification for Structural Concrete

- b. ACI 315 - Details and Detailing of Concrete Reinforcing.
- c. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.

1.4 SUBMITTALS

- A. As specified in Section 01 33 00 – Submittal Procedures.

1.5 QUALITY ASSURANCE

- A. Code Requirements: Unless otherwise specified all work specified herein and as shown on the drawings shall conform to the applicable requirements of the California Building Code (CBC), and the State Standard Specifications.
- B. Standard: Reinforcing steel installations shall conform to the current specification requirements of the Concrete Reinforcing Steel Institute “Manual of Standard Practice” (herein referred to as the CRSI Manual) except as otherwise indicated or specified.
- C. Shop Quality Control:
 - 1. Provide Testing Laboratory with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.
- D. Field Quality Control: All continuous inspections shall be performed by “Special Inspectors” qualified and approved by Governing Building Code Authority or inspector as otherwise qualified and approved by the Owner. Reports as required by Code shall be prepared and submitted to Owner, Building Department, Design Professional in Responsible Charge and Contractor.
 - 1. Inspection of Reinforcing. Provide 48-hour advance notice to permit inspection of in-place reinforcement prior to closing forms and refer to applicable requirements of Section 03 30 00 of these Specifications.
 - 2. Concreting Operations. During concrete placing, assign construction personnel to inspect reinforcement and maintain bars in correct positions at each pour location.
- E. COORDINATION
 - 1. Coordinate with placement of formwork, formed openings and other Work.

PART 2 PRODUCTS

2.1 REINFORCING

- A. Deformed bars conforming to ASTM A615, Type “S”, in the grades as follows, and conforming to ACI 318 Chapter 20 and Section 26.6.
 - 1. For No.4 and larger bars, use 60 ksi yield grade.

CONCRETE REINFORCING
03 20 00-2

2. For ties and stirrups, and No. 3 and smaller bars, use 40 or 60 ksi yield grade.

2.2 *WELDED WIRE REINFORCEMENT*

- A. Conform to ASTM A1064 in flat sheets, uncoated finish. 6 x 6 - W4.0 x W4.0 unless otherwise noted on drawings.

2.3 *TIE WIRE*

- A. Annealed steel, 16-gage minimum.

2.4 *REINFORCING SUPPORT*

- A. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.
- B. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel type; size and shape as required.
- C. Concrete Blocks: Approximately 3 inches dimension each side.

2.5 *COUPLER SPLICE DEVICES*

- A. Reinforcing bar coupler/splice devices which bear current ICC Evaluation Report Number, and which develop at least 125 percent of bar yield strength in tension may be used with Owner's approval in lieu of lapped bar-type splices. Submit for Owner's approval in each instance.

2.6 *DOWELS*

- A. Where and as designated on Drawings, provide reinforcing bar dowels in new work and for anchorage to existing concrete. For anchorage where shown or required to existing construction, use non-shrink epoxy type grout or deferred bolting devices as approved in each instance and conforming to "Product" Article requirements of this Specification.

2.7 *FABRICATION AND DELIVERY*

- A. Conform to CRSI Manual Chapters 6 and 7 except as otherwise indicated or specified and ACI 315 and 318. Bundle reinforcement and tag with suitable identification to facilitate sorting and placing, and transport and store at site so as not to damage material. Keep a sufficient supply of tested, approved, and proper reinforcement at site to avoid delays.
- B. Bending and Forming. Fabricate bars of indicated size and accurately form to shapes and lengths indicated and required by methods not injurious to materials. Do not heat reinforcement for bending. Bars with kinks or bends not scheduled will be rejected. Rebending of bars is prohibited.

PART 3 EXECUTION

3.1 PLACING

- A. General: Comply with CBC and CRSI's "Manual of Standard Practice" for placing reinforcement, except no reduction of concrete cover is allowable for bars at concrete surfaces exposed in liquid or water-containing structures.
- B. Cleaning. Before placing reinforcing, and again before concrete is placed, clean reinforcement of loose mill scale, oil, or other coating that might destroy or reduce bond. Do not allow form coatings, release agents, bond breaker, or curing compound to contact reinforcement.
- C. Concrete coverage over reinforcing bars shall be in accordance with ACI 318 Section 20.5.1.3 unless otherwise shown on the Drawings. Measure the coverage to the outer edge of ties, stirrups, bar spacers, hangers, and like items, and detail and fabricate the reinforcing accordingly.
- D. Do not displace or damage vapor barrier where vapor barrier is specified or indicated on drawings. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- E. Accommodate placement of formed openings.
- F. Securing in Place. Accurately place reinforcement and securely wire tie in precise position at all points where bars cross. Tie stirrups to bars at both top and bottom. Bend ends of binding wires inward, allowing no encroachment on the concrete cover; exercise special care at surfaces to remain exposed and unpainted. Support bars in accordance with CRSI Manual Chapter 3, Specifications for Placing Bar Supports, using approved chairs and supports.
- G. Splices. Provide wired contact lap splices unless otherwise indicated or approved. Provide lap lengths as indicated on the Drawings.
 - 1. Tie reinforcement splices and intersections per CBC and CRSI, Chapter 10- General Principles for Placing, Splicing and Tying Reinforcing Bars, unless otherwise shown on the Drawings.
- H. Welding. Welding of reinforcing bars may be permitted on case-by-case basis. All welding of reinforcing bars will be approved by the Engineers.
- I. Additional Reinforcing. Provide additional reinforcing bars at sleeves and openings as indicated on the Drawings.
- J. Welded Wire Reinforcement. Install necessary supports and chairs to hold in place during concrete pours. Straighten reinforcement to lay in flat plane and bend reinforcement as shown or required to fit work. Provide laps of no less than one complete mesh unless otherwise detailed. Tie every other wire at laps. Welded wire reinforcement rolls are not acceptable.
- K. During placing of structural concrete slabs, provide a full-time reinforcing steel placer to repair and replace reinforcing to its proper location. Provide additional chairs of

CONCRETE REINFORCING
03 20 00-4

the proper size available to place under bars displaced during the concrete pouring operation.

END SECTION

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SECTION 03 30 10

CONCRETE SITE WORK

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Work required under this section consists of furnishing all materials, supplies, equipment, tools, transportation, and facilities, and performing all labor and services incidental to furnishing and installing concrete work as described in this section of the Specifications, shown on the accompanying Plans, or reasonably implied therefrom, except as hereinafter specifically excluded. The work shall include, but is not necessarily limited to:
 - 1. All concrete placement and finishing.
 - 2. Installation of all reglets, bolts, anchors, sleeves, etc., whether furnished under this section or by others .
 - 3. The furnishing of all items required to be or shown on the Plans as embedded in concrete, which are not specifically required under other sections.
 - 4. Setting headers and screeds for finishing and protecting concrete.
- B. Where prior inspection and test of materials are required, documentary evidence, in the form of test reports, shall be furnished prior to the time the material is incorporated into the work. All rejected material shall be promptly removed from the premises.

1.2 RELATED WORK

- A. Section 03 15 20 – Anchor Bolts and Post-Installed Anchors
- B. Section 03 20 00 – Concrete Reinforcing
- C. Section 03 39 00 – Concrete Curing

1.3 REFERENCES

- A. American Concrete Institute (ACI)
- B. American Society for Testing and Materials (ASTM)
- C. State Standard Specifications
- D. California Building Code (CBC)

1.4 DEFECTIVE WORK

- A. Work considered to be defective may be ordered, by the Engineer, to be replaced in which case the Contractor shall remove and replace the defective work at his

CONCRETE SITE WORK
03 30 10-1

expense. Work considered to be defective shall include, but not be limited to, the following:

1. Concrete incorrectly formed, or not conforming to details and dimensions on the Plans or with the intent of these documents, or concrete the surfaces of which are out of plumb or level.
2. Concrete in which defective or inadequate reinforcing steel has been placed.
3. Concrete containing wood, cloth, or other foreign matter, rock pockets, voids, honeycombs, cracks or cold joints not scheduled or indicated on the Plans.
4. Concrete below specified strength.

1.5 SUBMITTALS

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. Provide material certificates, shop fabrication and placement drawings, and schedule for all reinforcing steel, imbedded items, form release and curing compounds.
- C. The Contractor shall provide a proposed concrete placement plan (to minimize the effects of cracking and differential settlement) to the Engineer, and gain approval of said plan, prior to ordering of reinforcing steel. As a minimum this plan shall contain the layout of horizontal and vertical construction joints, spaced no greater than 30 feet apart (unless specifically approved otherwise by the Engineer), and a pour schedule for the individual slab and wall pours.

PART 2 PRODUCTS

2.1 CONCRETE

- A. Concrete shall conform to Section 90 of the State Standard Specifications. Unless otherwise shown on the concrete note sheet or specified in other sections, all concrete shall contain not less than 611 pounds of Portland cement per cubic yard of concrete (6-1/2 sack) with a minimum 28-day compressive strength of 4500 psi.
 1. Portland cement shall be Type II.
 2. Water/cement ratio shall not exceed 0.45 (by weight).
 3. Slump at placement shall be 4 inches +/- 1 inch.
- B. Concrete used for thrust blocks shall contain not less than 517 pounds of Type II Portland Cement per cubic yard of concrete (5 1/2 sack) with a slump of 4 inches +/- 1 inch.
- C. Concrete used for pipe encasement shall contain not less than 517 pounds of Type II Portland Cement per cubic yard of concrete (5 1/2 sack).

- D. Slurry cement backfill used in lieu of compacted soil shall contain not less than 188-pounds of Type II Portland Cement per cubic yard of concrete (2 sack) and shall comply with Section 19 of the State Standard Specifications.

2.2 AGGREGATE

- A. Aggregate for normal weight concrete shall conform to ASTM C33. Aggregates shall be free of dirt, clay balls, roots, bark and other deleterious substances and shall be thoroughly washed before use.
- B. The combined aggregates for concrete shall conform to the grading limits for the one inch, maximum size specified in Section 90-1.02C(4)(d) of the State Standard Specifications, Combined Aggregate Grading.

2.3 WATER

- A. Water shall be clean and free from injurious amounts of acids, alkalis, salts, oils, organic materials or other deleterious substances.

2.4 FLYASH

- A. Fly Ash: ASTM C618, Class F
 - 1. Type of fly ash shall be compatible with the type of cement and the intended use of the concrete.
- B. The weight of fly ash conforming to ASTM C618 shall not exceed 25 percent of the total cementitious material.

2.5 ADMIXTURES

- A. Air Entraining: ASTM C260
- B. Water Reducing: ASTM C494, Type A or D
- C. Accelerating: ASTM C494, Type C or E
 - 1. No admixture containing any chloride ions is acceptable.
- D. Retarding: ASTM C494, Type B or D

PART 3 EXECUTION

3.1 REINFORCING STEEL

- A. Reinforcing shall comply with Section 03 20 00 – Concrete Reinforcement.

3.2 FORMS

- A. Formwork shall conform with Section 03 11 00 Concrete Formwork.

3.3 PLACING

- A. All concrete shall be placed before it has taken its initial set and shall be placed in horizontal layers and in such a manner as to avoid segregation. The concrete adjacent to the forms and joints shall be thoroughly consolidated with a vibrator operating at not less than 4,500 vibrations per minute.
 - 1. Pumping equipment shall be of suitable type, without Y-sections, and with adequate pumping capacity.
 - 2. Loss of slump in pumping shall not exceed 1 1/2 ".
 - 3. Concrete shall not be placed through reinforcing that may cause separation of aggregates.
- B. The concrete shall be deposited as nearly as possible in its final position. Drop chutes and elephant trunks shall be used on drops greater than 5 feet. Concrete shall be placed at such a rate that all concrete in the same lift will be deposited on plastic concrete. The concrete comprising each unit of work shall be placed in a continuous lift.
- C. The Contractor shall notify the Engineer 24 hours (1 working day) prior to concrete placement.
 - 1. The form work and reinforcing steel placement shall be approved by the Engineer prior to ordering concrete.
- D. Form Removal. Minimum times for removal after concrete placement shall conform to 03 11 00 Concrete Formwork.
- E. Construction Joints
 - 1. ~~At ends of the first concrete pour, provide forms that positively locate any waterstop.~~ Ensure the end forms of walls are removable without releasing the side forms. Provide seals around reinforcement and water stop to prevent mortar leaks.
 - 2. Overlap the hardened concrete of the first pour with forms for the second pour. Brace the ends of the forms against the hardened concrete to prevent joint offsets and mortar leakage. Align any exterior features required on the finished surface.

3.4 CONCRETE JOINTS

- A. General
 - 1. Provide joints:
 - a. As shown on the Drawings and as noted below in these Specifications.
 - b. As required for constructability

- c. After favorable review of layout, sequence and concrete placement program.
 2. Provide minimum curing times before the second placement:
 - a. 2 days after the first concrete placement at the joint.
 - b. 10 days after each adjacent concrete placement, for infill pours or checkerboard placement pattern.
- B. Control Joints:
1. Space typical control joints in slabs on grade not exceeding 10 feet, or as shown on the Drawings. Control joints shall not be provided in water containment structures.
 2. If cast-in with the concrete, positively locate the preformed joint filler and hold rigidly in place during concreting.
 3. If saw-cut, use a wheeled power saw as soon as the concrete surface is firm enough. Saw-cut control joints must be constructed within 8-hours after concrete placement. Fill the groove with sealant over a backer rod.
- C. Construction Joints:
1. Produce quality concrete, with full continuity of reinforcing and water tightness across the joints.
 2. Space typical construction joints not exceeding 30 feet in the direction of the transverse or secondary reinforcing, typically the smaller reinforcing nearer to the center of the slab thickness. Space typical vertical wall joints no more than 30 feet apart.
 3. ~~Provide all joints in walls and slabs, retaining liquids, or earth with 6-inch waterstops.~~ Continue all reinforcing through the joint unless otherwise noted.
 4. After the first concrete placement at the joint, do not walk on or disturb any reinforcing extending into the second placement area for at least 48 hours.
 5. Before depositing new concrete on or against concrete that has hardened, clean and roughen the entire surface of the joint exposing clean coarse aggregate solidly embedded in mortar matrix. Provide typically 1/4-inch roughness or amplitude of the concrete surface measured from the top of the exposed aggregate to the bottom of pockets between stones.
 6. Drench the prepared joint with clean water and remove prior to the concrete pour.
 7. ~~Use special care in vibrating adjacent to construction joints to ensure thorough consolidation of the concrete around the waterstops and against the hardened portion of the joint. Additional hand tamping may be required.~~

8. For joints that are shown on architectural drawings as having a continuous reveal or recess, leave the wood form or pour strip used to create the reveal or recess in place or re-insert before roughening. Prevent the next concrete placement from filling the reveal or recess.

D. Expansion Joints

1. Stop all steel reinforcing clear of the joint at each side.
2. ~~Provide center bulb waterstop continuously around the joint in walls and slabs retaining liquids.~~
3. Prepare a smooth first concrete surface with all voids filled.
4. Provide preformed joint filler, securely fastened to the existing concrete as directed by the Manufacturer.
5. Install bond breaker and sealant after curing is completed and when directed.

- E. Bonding to Pre-existing Concrete: Mechanically roughen the old surface to a 1/4-inch amplitude, as defined in construction joint paragraph above. Apply epoxy bonding material prior to concreting, as recommended by the manufacturer.

~~F. Waterstop~~

1. ~~Restrict field splices to butt joints in straight runs. For PVC type, make by heat welding, using a splicing iron. For rubber, provide sleeve joints and glue. Follow the manufacturer's specifications.~~
2. ~~Positively locate and support in the forms so that concrete may be placed, consolidated, and vibrated on both sides of the embedded portion without displacement of the waterstop and without causing voids in the concrete. Protect the outstanding portion from damage during the first concrete pour and clean and positively support prior to the second pour. Place, consolidate and vibrate the second pour without displacement of the waterstop and without causing voids in the concrete.~~

3.5 CONCRETE CURING

- A. Exposed concrete surfaces shall be protected from premature drying in accordance with Section 03 39 00 Concrete Curing.

3.6 FINISHING

- A. Defective and honeycombed surfaces shall be chipped back to such a depth to expose solid concrete. The surface shall be dampened and coated with a bonding agent and packed with mortar.
- B. Concrete Finishes for Vertical Wall Surfaces:
1. Form facing material shall produce a smooth, hard, uniform texture.

- a. Use forms specified for surfaces exposed to view in accordance with the Plans and other Specification Sections.
 2. At a minimum, repair the following surface defects:
 - a. Tie holes
 - b. Honeycombs deeper than $\frac{1}{4}$ "
 - c. Air pockets deeper than $\frac{1}{4}$ "
 - d. Rock holes deeper than $\frac{1}{4}$ "
 - e. Scabbing
 3. Chip or rub off fins exceeding $\frac{1}{8}$ " in height.
 4. Provide SF/ESF-3.0 finish and a smooth-rubbed finish for:
 - a. Walls being waterproofed, painted, coated with some other material.
 - b. Use at all exposed surfaces not specified to receive another finish.
- C. Related Uniform Surfaces (Except Slabs):
1. Strike smooth tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces after concrete is placed.
 2. Float surface to a texture consistent with that of formed surfaces.
 3. Continue treatment uniformly across unformed surfaces.
- D. Concrete Finishes for Horizontal Slab Surfaces:
1. General: Tamp concrete to force coarse aggregate down from surface. Screed with straightedge, eliminate high and low places, bring surface to required finish elevations; slope uniformly to drains. Dusting of surface with dry cement or sand during finishing processes not permitted.
 2. Slab Finish shall be as follows:
 - a. Surfaces intended to receive damp proofing or water proofing membranes: Float finish.
 - b. Floors intended to receive floor coverings and interior rooms: Trowel finish.
 - c. Sidewalks, garage floors, drive-throughs and ramps: Broom finish.

- d. Exterior slabs, platforms, steps and landings, exterior and interior pedestrian ramps and interior stairs and all process equipment areas, not covered by other finish materials: Broom finish.
3. Tolerance for finished surface shall not exceed $SO F_F=35$, $SO F_L = 25$.
4. No tolerance will be allowed that will result in the maximum running, or cross, slope exceeding the requirements of the Americans with Disabilities Act.

3.7 TESTING

- A. Testing of concrete shall be as required by the Engineer and in accordance with ACI 301, Chapter 1.6.
 1. All costs of initial testing will be paid by the Owner unless otherwise noted.
 2. All costs involved, including those required by the Engineer, in retesting of concrete required because of a failure to meet these Specifications shall be at the expense of the Contractor.

3.8 WATERTIGHTNESS OF CONCRETE WORK

- A. It is the intent of this Specification to obtain concrete and grout with homogenous structure, which when hardened will have the required strength, is watertight, and resistance to weathering.

~~3.9 HYDRAULIC TESTING OF STRUCTURES~~

- ~~A. It is the intent of this Specification to obtain concrete and grout with homogenous structure, which when hardened will have the required strength, watertightness, and resistance to weathering. Testing of structures shall be done in accordance with Section 03 05 10 Leakage Testing of Hydraulic Structures.~~

END SECTION

SECTION 07 31 13
ASPHALT SHINGLES

PART 1 - GENERAL

1.1 *RELATED DOCUMENTS*

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 *SUMMARY*

- A. Section Includes:
 - 1. Asphalt shingles.
 - 2. Underlayment.
- B. Related Sections:
 - 1. Division 06 Section "Plywood Sheathing" for roof sheathing.
 - 2. Division 07 Section "Sheet Metal Flashing and Trim" for sheet metal flashing and trim to be installed integral with shingle roofing.

1.3 *DEFINITION*

- A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 *SUBMITTALS*

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of asphalt shingle indicated.
- C. Samples for Verification: Asphalt shingle, full size, to verify color selected.
- D. Qualification Data: For qualified Installer.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for asphalt shingles.

- F. Maintenance Data: For each type of asphalt shingle to include in maintenance manuals.
- G. Warranties: Sample of special warranties.

1.5 *QUALITY ASSURANCE*

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain ridge and hip cap shingles from a single source from a single manufacturer.
- C. Fire-Resistance Characteristics: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
 - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

1.6 *DELIVERY, STORAGE, AND HANDLING*

- A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.
 - 1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.
- B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.7 *PROJECT CONDITIONS*

- A. Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer's written recommendations.
- B. Do not install products on wet substrates.

1.8 *WARRANTY*

- A. Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Manufacturing defects.

- b. Structural failures including failure of asphalt shingles to self-seal after a reasonable time.
- 2. Material Warranty Period: 40 years from date of Substantial Completion, prorated, with first five years non-prorated.
- 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 70 mph for 10 years from date of Substantial Completion.
- 4. Workmanship Warranty Period: 10 years from date of Substantial Completion.
- B. Special Project Warranty: Roofing Installer's Warranty, or warranty form at end of this Section, signed by roofing Installer, covering the Work of this Section, in which roofing Installer agrees to repair or replace components of asphalt shingle roofing that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Existing Warranties: Work of this section shall not void or affect existing roofing warranties.

PART 2 - PRODUCTS

2.1 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: Laminated, two-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, self-sealing, and complying with ASTM D3462, D3161, and D3018 Type I.
 - 1. Basis of Design Products: Drawings and specifications are based on the following:
 - a. Elk Premium Building Products, Inc.; an ElkCorp company.
 - b. GAF Materials Corporation.
 - 2. Physical Properties:
 - a. Weight: 265 lbs. per square.
 - b. Exposure: 5-5/8 inch.
 - c. Granule Adhesion: Maximum 1.0 gram loss.
 - d. Butt Edge: Straight.
 - e. Strip Size: 13-1/4 x 38-3/4 inches.
 - f. Algae Resistance: Granules treated to resist algae discoloration.

- g. Fire Resistance Classification: Class A, ASTM E108.
 - h. Color and Blends: As selected by Architect from manufacturer's full range.
 - 3. Hip and Ridge Shingles: Manufacturer's standard units to match shingles.
- B. Laminated-Strip, SBS-Modified Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
 - 1. Basis-of-Design Product: Drawings and specifications are based on the following:
 - a. Atlas Roofing Corporation.
 - b. Malarkey Roofing Products.
 - 2. Physical Properties:
 - a. Exposure: 5-5/8 inch.
 - b. Granule Adhesion: Maximum 1.0 gram loss.
 - c. Butt Edge: Straight.
 - d. Strip Size: 13-1/4 x 38-3/4 inches.
 - e. Algae Resistance: Granules treated to resist algae discoloration.
 - f. Fire Resistance Classification: Class A, ASTM E108.
 - g. Color and Blends: As selected by Architect from manufacturer's full range.
 - 3. Hip and Ridge Shingles: Manufacturer's standard units to match shingles.

2.2 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226 or ASTM D 4869, Type II, SBS-modified asphalt-saturated organic felts, nonperforated.

2.3 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch diameter, barbed shank, sharp-pointed, with a minimum 3/8-inch diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.
 - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

- C. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch minimum diameter.

2.4 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."
- B. Sheet Metal: 24 gauge hot-dip galvanized steel sheet, complying with ASTM A 653/A 653M, G90/Z275.
- C. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.
 - 1. Step Flashings: Fabricate with a headlap of 2 inches and a minimum extension of 4 inches over the underlying asphalt shingle and up the vertical surface.
 - 2. Drip Edges: Fabricate in lengths not exceeding 10 feet with 2-inch roof-deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips, that installation is within flatness tolerances, and that fasteners are flush with the sheathing.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove existing roofing to the extent required to accommodate interfacing with new roofing.

3.3 *UNDERLAYMENT INSTALLATION*

- A. General: Comply with shingle and underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Double-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Install a 19-inch wide starter course at eaves and completely cover with full-width second course. Install succeeding courses lapping previous courses 19 inches in shingle fashion. Lap ends a minimum of 6 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt underlayment nails.

3.4 *METAL FLASHING INSTALLATION*

- A. General: Install metal flashings and other sheet metal to comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim" and manufacturer's printed installation instructions.
 - 1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.
- C. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.5 *ASPHALT SHINGLE INSTALLATION*

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip at least 7 inches wide with self-sealing strip face up at roof edge.
 - 1. Extend asphalt shingles 1/2 inch over fascia at eaves and rakes.
 - 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- D. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.

- E. Fasten asphalt shingle strips according to manufacturer's written instructions and in compliance with CBC Table 15-B-1.
- F. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section

1.2 SUMMARY

- A. Section Includes:
 - 1. Formed sheet metal fabrications:
 - a. Flashing and trim.
 - b. Gutters and downspouts.
- B. Related Sections include the following:
 - 1. Division 07 Section "Asphalt Shingle Roofing."

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 SUBMITTALS

- A. Product Data: For each type of manufactured product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings: For fabricated sheet metal items. Show fabrication and installation layouts including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop and field-assembled work. Include the following:
 - 1. Identification of material, thickness, weight, and finish for each item and location in Project.

2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
4. Details of termination points and assemblies, including fixed points.
5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
7. Details of special conditions.
8. Details of connections to adjoining work.
9. Detail formed flashing and trim at a scale of not less than 3 inches per 12 inches.

C. Sample Warranty: For special warranty.

1.5 *QUALITY ASSURANCE*

- A. Fabricator Qualifications: Entity that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.6 *DELIVERY, STORAGE, AND HANDLING*

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

PART 2 - PRODUCTS

2.1 *PERFORMANCE REQUIREMENTS*

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The Roofing and Waterproofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements as applicable for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Thermal Movements: Sheet metal flashing and trim shall allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
 - a. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil
- C. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 coating designation or aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40.
 - 1. Surface: Smooth, flat

2.3 UNDERLAYMENT MATERIALS

- A. Polyethylene Sheet: 6-mil thick polyethylene sheet complying with ASTM D 4397.
- B. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. Self-drilling screws, gasketed, with hex-washer head.
 2. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 4. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.
- C. Solder for Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane, polysulfide, or silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 *FABRICATION, GENERAL*

- A. General: Custom fabricate sheet metal flashing and trim as indicated on Drawings and to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 2. Obtain field measurements for accurate fit before shop fabrication.
 3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.
- D. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored and of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.
- F. Seams: Fabricate nonmoving seams with flat-lock seams and as follows:
 1. Seams for Pre-Finished Metal: Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
 2. Seams for Unfinished Sheet Steel: Tin edges to be seamed, form seams, and solder.
 3. Seams for Unfinished Aluminum: Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
- G. Do not use graphite pencils to mark metal surfaces.
- H. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

2.6 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.
 1. Expansion Joints: Butt type with cover plate. Space expansion joints not more than 40 feet on center.
 2. Accessories: Wire ball downspout strainer.
 3. Gutters: Fabricate from 0.028 inch (24 gage) thick galvanized steel.

- B. Downspouts: Fabricate downspouts of size and profile indicated on Drawings complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors. Fabricate from same material and thickness as gutters.

2.7 *STEEP-SLOPE ROOF SHEET METAL FABRICATIONS*

- A. Apron, Step, Cricket, and Backer Flashing: Fabricate from 0.028 inch (24 gage) thick galvanized steel.
- B. Drip Edges: Fabricate from 0.028 inch (24 gage) thick galvanized steel.
- C. Eave, Rake Flashing: Fabricate from 0.028 inch (24 gage) thick galvanized steel.
- D. Base Flashing: Fabricate from 0.028 inch (24 gage) thick galvanized steel.
- E. Roof-Penetration Flashing: Fabricate from 0.028 inch (24 gage) thick galvanized steel.

2.8 *MISCELLANEOUS SHEET METAL FABRICATIONS*

- A. Miscellaneous Sheet Metal Fabrications: Fabricate from 0.028 inch (24 gage) thick galvanized steel unless otherwise indicated.

2.9 *FINISHES*

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 *EXAMINATION*

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 *UNDERLAYMENT INSTALLATION*

- A. Polyethylene Sheet: Install polyethylene sheet with adhesive for anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches.
- B. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

3.3 *INSTALLATION, GENERAL*

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 3. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
 - 4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
 - 5. Install sealant tape where indicated.
 - 6. Torch cutting of sheet metal flashing and trim is not permitted.
 - 7. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
 - 1. Coat back side of uncoated aluminum sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corners or intersections. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
- D. Fastener Sizes:
 - 1. Wood Framing, Blocking, and Sheathing: Use fasteners of sizes that will penetrate [wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
- E. Seal joints as shown and as required for watertight construction.
 - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 - 2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
- F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.
 - 1. Do not solder coil-coated steel and aluminum sheet.
 - 2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- G. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength.

3.4 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets or straps spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant.
 - 1. Fasten gutter spacers to front and back of gutter.

2. Loosely lock straps to front gutter bead and anchor to roof deck.
 3. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
 4. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
 5. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion joint caps.
- C. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches on center in between.
1. Provide elbows at base of downspout to direct water away from building.
 2. Connect downspouts to underground drainage system where indicated.

3.5 *ROOF FLASHING INSTALLATION*

- A. General: Install sheet metal flashing and trim to comply with performance requirements, SMACNA's "Architectural Sheet Metal Manual," and NRCA's Roofing and Waterproofing Manuals as applicable to project conditions. Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to referenced requirements and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at 16 inch centers.
- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.6 *MISCELLANEOUS FLASHING INSTALLATION*

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.7 *ERECTION TOLERANCES*

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 *CLEANING AND PROTECTION*

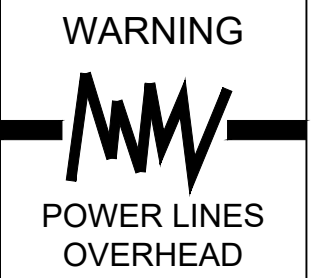
- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

CITY OF TURLOCK

CITY PROJECT NO. 2020-79

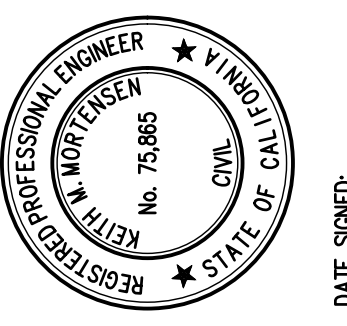
CITY WIDE CHLORINATION



Know what's below.
Call before you dig.

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CITY WIDE CHLORINATION
CITY OF TURLOCK
CITY PROJECT NO. 2020-79
GENERAL

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KEITH MORTENSEN
LICENSE NO:
75865

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CHECKED BY: RKB
DATE: NOV 2020
JOB NO: 229220006

PROJECT NO:
PHASE: CD

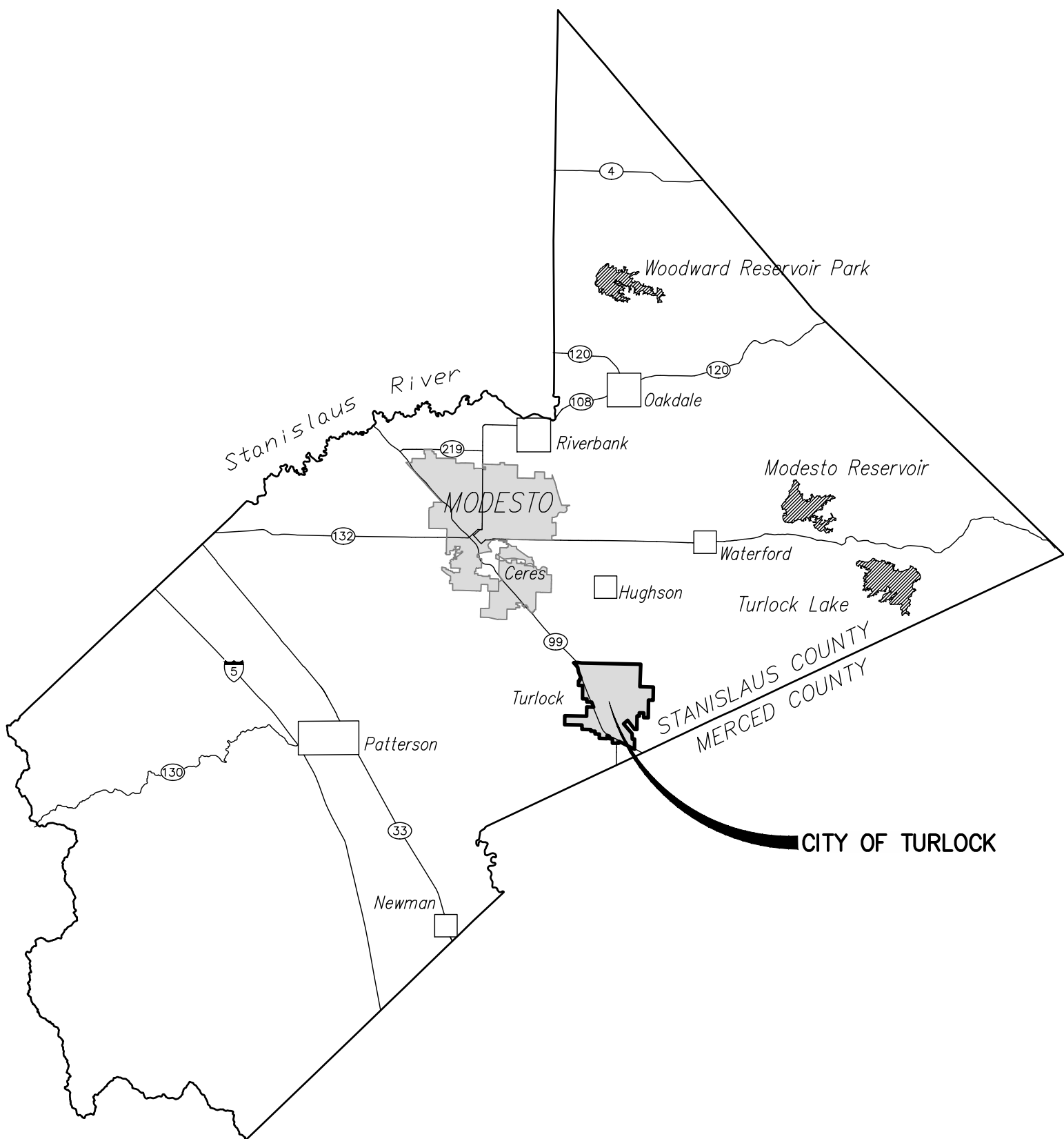
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SHEET
G-1

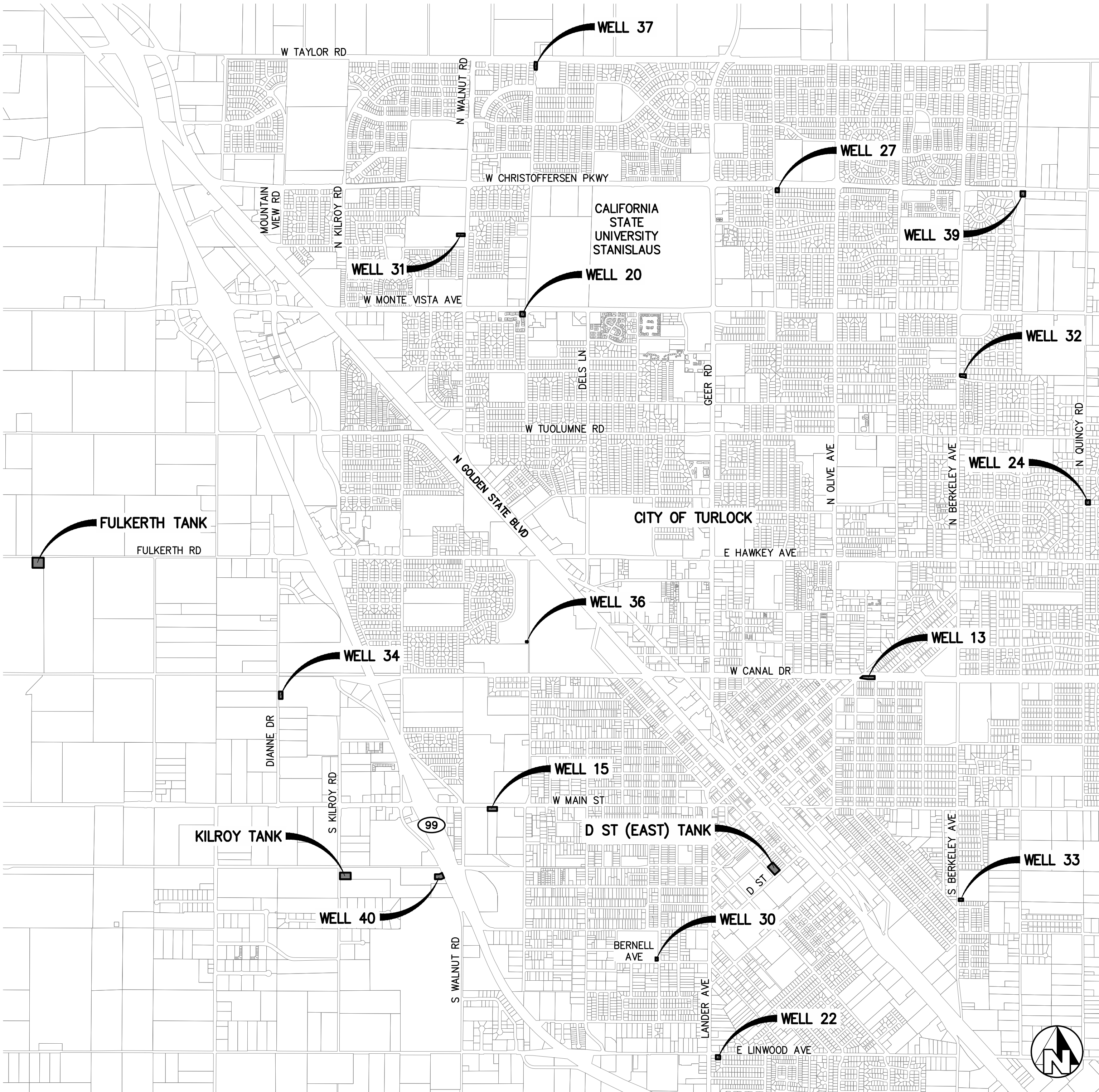
1 OF 57

SHEET INDEX		
SHEET NO.	SEQ. SHEET NO.	DESCRIPTION
GENERAL		
G-1	1	COVER SHEET
G-2	2	LEGENDS AND ABBREVIATIONS
G-3	3	GENERAL NOTES
G-4	4	GENERAL NOTES
G-5	5	DESIGN CRITERIA
G-6	6	CHEMICAL INJECTION PROCESS FLOW
G-7	7	SURVEY NOTES
CIVIL		
C-1	8	D STREET (EAST) TANK SITE PLAN
C-2	9	FULKERTH ROAD TANK SITE PLAN
C-3	10	KILROY ROAD TANK SITE PLAN
C-13	11	WELL 13 SITE PLAN
C-15	12	WELL 15 SITE PLAN
C-20	13	WELL 20 SITE PLAN
C-22	14	WELL 22 SITE PLAN
C-24	15	WELL 24 SITE PLAN
C-27	16	WELL 27 SITE PLAN
C-30	17	WELL 30 SITE PLAN
C-31	18	WELL 31 SITE PLAN
C-32	19	WELL 32 SITE PLAN
C-33	20	WELL 33 SITE PLAN
C-34	21	WELL 34 SITE PLAN
C-36	22	WELL 36 SITE PLAN
C-37	23	WELL 37 SITE PLAN
C-39	24	WELL 39 SITE PLAN
C-40	25	WELL 40 SITE PLAN
DETAILS		
D-1	26	CHLORINATION ENCLOSURE DETAILS
D-2	27	CHLORINATION ENCLOSURE DETAILS
D-3	28	CHLORINATION DETAILS
D-4	29	CHLORINATION DETAILS
D-5	30	CHLORINATION DETAILS
D-6	31	SAMPLING STATION DETAILS
D-7	32	STRUCTURAL DETAILS
D-8	33	STRUCTURAL DETAILS
D-8B	---	STRUCTURAL DETAILS
D-8C	---	FENCING DETAILS
D-8D	---	STRUCTURAL DETAILS
D-9	34	CITY STANDARD DETAILS
D-10		
ELECTRICAL		
EG-1	36	GENERAL NOTES AND ABBREVIATIONS
E-1	37	PARTIAL SITE PLAN - DST TANK
E-2	38	PARTIAL SITE PLAN - FULKERTH TANK
E-3	39	PARTIAL SITE PLAN - KILROY TANK
E-13	40	PARTIAL SITE PLAN - WELL 13
E-15	41	PARTIAL SITE PLAN - WELL 15
E-20	42	PARTIAL SITE PLAN - WELL 20
E-22	43	PARTIAL SITE PLAN - WELL 22
E-24	44	PARTIAL SITE PLAN - WELL 24
E-27	45	PARTIAL SITE PLAN - WELL 27
E-30	46	PARTIAL SITE PLAN - WELL 30
E-31	47	PARTIAL SITE PLAN - WELL 31
E-32	48	PARTIAL SITE PLAN - WELL 32
E-33	49	PARTIAL SITE PLAN - WELL 33
E-34	50	PARTIAL SITE PLAN - WELL 34
E-36	51	PARTIAL SITE PLAN - WELL 36
E-37	52	PARTIAL SITE PLAN - WELL 37
E-39	53	PARTIAL SITE PLAN - WELL 39
E-40	54	PARTIAL SITE PLAN - WELL 40
ED-1	55	INSTRUMENTATION TITLE SHEET
ED-2	56	INSTRUMENTATION CONTROLS
ED-3	57	INSTRUMENTATION CONTROLS

APPROVALS	
NATHAN BRAY, P.E., INTERIM DEVELOPMENT SERVICES DIRECTOR/CITY ENGINEER	DATE
MARK GOMEZ, FIRE MARSHAL/DIVISION FIRE CHIEF	DATE



VICINITY MAP
NOT TO SCALE



SITE MAP
NOT TO SCALE

GENERAL CITY NOTES

- DISTANCES AND MEASUREMENTS ARE GIVEN AND WILL BE MADE IN HORIZONTAL PLANE. GRADES ARE GIVEN FROM THE TOP OF STAKES OR NAILS UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL PRESERVE ALL STAKES AND POINTS SET FOR LINES, GRADES OR MEASUREMENTS OF THE WORK IN THEIR PROPER PLACES. ALL EXPENSES INCURRED IN REPLACING STAKES THAT HAVE BEEN REMOVED WITHOUT PROPER AUTHORITY SHALL BE PAID FOR BY THE GENERAL CONTRACTOR.
- ALL WORK TO BE DONE IN ACCORDANCE WITH CITY OF TURLOCK STANDARDS.
- CONTRACTOR SHALL COMPLY WITH ALLAPPLICABLE STATE AND FEDERAL SAFETY AND LABOR CODES.
- CONTRACTOR SHALL OBTAIN ENCROACHMENT PERMIT FROM THE CITY OF TURLOCK PRIOR TO BEGINNING WORK (NO FEE).
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESERVATION AND PROTECTION OF ALL UNDERGROUND PIPES, CONDUITS AND OTHER IMPROVEMENTS WHETHER SHOWN ON THE PLANS OR NOT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ALL UTILITY COMPANIES AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL NOTIFY:
 - UNDERGROUND SERVICE ALERT (USA) AT 1-800-227-2600 TO LOCATE EXACT POSITION OF UNDERGROUND TELEPHONE CABLE, GAS LINES, SEWER LINES AND WATER LINES.
 - TURLOCK IRRIGATION DISTRICT AT (209) 883-8464 TO LOCATE UNDERGROUND ELECTRICAL CONDUIT.
 - CHARTER CABLE AT (209) 656-2124 TO LOCATE UNDERGROUND CABLE T.V.
 - FIRE DEPARTMENT AT (209) 668-5580, POLICE DEPT. AT (209) 668-5550 AND AMBULANCE AT (209) 632-2271.
- ANY UTILITY TO BE RELOCATED OR REMOVED SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY.
- WHERE EXISTING PAVEMENT IS SCHEDULED TO BE REMOVED ADJACENT TO EXISTING PAVEMENT TO REMAIN IN PLACE, THE CONTRACTOR SHALL SAWCUT THE EXISTING PAVEMENT TO INSURE CLEAN VERTICAL EDGE TO PAVE AGAINST.
- LOCATION AND DEPTH OF EXISTING SUB-SURFACE STRUCTURE ARE NOT GUARANTEED. CONTRACTOR SHALL VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF EXISTING BURIED UTILITIES SHOWN ON THE PLANS PRIOR TO DIGGING NEAR EXISTING BURIED UTILITIES.
- ALL REFERENCES AND WRITTEN DIMENSIONS SHALL TAKE PREFERENCE OVER SCALED DIMENSIONS AND SHALL BE VERIFIED ON THE SITE. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORK.

DEMOLITION

- UNLESS NOTED OTHERWISE ON THE PLANS, ALL DEMOLISHED MATERIALS AND DEBRIS SHALL BE DISPOSED OF BY THE CONTRACTOR.
- DEMOLISH CONCRETE & ASPHALT SURFACING REQUIRED FOR UNDERGROUND PIPING, REPAIR TO EXISTING CONDITION.

LANDSCAPING

- THE CONTRACTOR SHALL REPLACE ALL LANDSCAPE IRRIGATION COMPONENTS (E.G. IRRIGATION PIPE, VALVES, CONTROLS, CONTROL WIRING, SPRAY HEADS, ETC.) DISTURBED DURING CONSTRUCTION.
- REPLACEMENT SPRAY HEADS SHALL BE OF A TYPE SUITABLE FOR PROVIDING FULL COVERAGE OF LANDSCAPING ACCOUNTING FOR CHANGES IN SPRAY HEAD AND PLANT LOCATIONS IF REQUIRED.

GENERAL

- BEFORE COMMENCING EXCAVATION, THE CONTRACTOR SHALL NOTIFY ALL UTILITY AUTHORITIES OR UTILITY COMPANIES HAVING INTEREST IN THE WORK OF THE CONTRACTOR'S INTENTION TO EXCAVATE PROXIMATE TO EXISTING FACILITIES AND THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH, AND SIZE OF ALL UTILITIES IN THE WORK AREA. THE WORK SHALL NOT BE COMMENCED UNTIL THE CONTRACTOR HAS FIRST BEEN PROVIDED AN INQUIRY IDENTIFICATION NUMBER FOR SUB-SURFACE INSTALLATIONS AS SPECIFIED IN SECTION 4216 OF THE GOVERNMENT CODE.
- CONTRACTOR SHALL NOTIFY AND COORDINATE ALL RELATED WORK WITH THE FOLLOWING AGENCIES:
 - CITY OF TURLOCK
 - CITY OF TURLOCK PUBLIC WORKS DEPARTMENT
 - CITY OF TURLOCK PARKS DEPARTMENT
 - PACIFIC GAS AND ELECTRIC COMPANY
 - AT&T
 - TURLOCK IRRIGATION DISTRICT
- ALL WATER DISTRIBUTION SYSTEM MAINS AND SERVICE CONNECTIONS SHALL BE KEPT IN CONSTANT SERVICE DURING THE WORK.
- THE CONTRACTOR SHALL PROVIDE RECORD DRAWINGS FOR ALL PROJECT IMPROVEMENTS.
- DETAILS AND NOTES ON TYPICAL SHEETS SHALL APPLY UNLESS SPECIFICALLY SHOWN OTHERWISE. DETAILS OF CONSTRUCTION NOT FULLY SHOWN SHALL BE OF THE SAME NATURE AS SHOWN FOR SIMILAR CONDITIONS.
- ALL DIMENSIONS ARE TO BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING WORK OR FABRICATION. IF ANY CONDITION EXISTS THAT IS NOT AS SHOWN ON THE DRAWINGS THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
- DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS SHALL HAVE PRECEDENCE OVER SCALED DRAWINGS.
- ALL WORK SHALL BE PERFORMED BY LICENSED CONTRACTOR(S) USING MATERIALS AND METHODS IN ACCORDANCE WITH APPLICABLE SECTIONS OF THE 2019 CALIFORNIA BUILDING CODE (CBC), LOCAL CODES AND ORDINANCES.
- ANY CHANGES TO THE APPROVED SET OF PLANS WITHOUT NOTIFYING THE ENGINEER PRIOR TO SUCH CHANGES ABSOLVES SAID ENGINEER FROM ANY AND ALL RESPONSIBILITY WITH RESPECT TO THE LIABILITY, DAMAGE OR EXTRA WORK RESULTING FROM SAID CHANGES.
- ALL WORK SHALL CONFORM TO THE LATEST APPLICABLE CONSTRUCTION SAFETY REQUIREMENTS OF OSHA AND ANY OTHER GOVERNMENTAL ENTITY HAVING JURISDICTION.
- THE DUTY OF THE ENGINEER TO CONDUCT CONSTRUCTION REVIEW OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON, OR NEAR THE CONSTRUCTION SITE.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER OR FIELD REPRESENTATIVES DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER WHETHER PERFORMED PRIOR TO, DURING, OR AFTER COMPLETION OF CONSTRUCTION ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS, BUT THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.

PIPING

- PIPE MATERIALS
 - ALL BURIED PRESSURE PIPING WITHIN THE SITE PROPERTY LINES SHALL BE DUCTILE IRON PIPE CONFORMING TO SPECIFICATION 40 05 00 UNLESS OTHERWISE NOTED.
 - ALL ABOVE GRADE PIPING 4 INCHES AND LARGER SHALL BE FBELC WELDED STEEL PIPE WITH FLANGED OR GROOVED CONNECTIONS CONFORMING TO SPECIFICATION 40 05 00 UNLESS OTHERWISE NOTED
 - ALL CHEMICAL PIPING SHALL BE 1/2-INCH POLYETHYLENE TUBING INSIDE OF EPVC CONDUIT CONFORMING TO SPECIFICATION 40 20 90 OR DOUBLE CONTAINED PIPING UNLESS OTHERWISE NOTED.
 - DRAIN PIPING 4 INCHES AND SMALLER SHALL BE ASTM D 3034, SDR 35, UNLESS NOTED OTHERWISE.
- RESTRAIN ALL ON-SITE PRESSURE PIPING IN ACCORDANCE WITH SPECIFICATION 40 05 00. THRUST BLOCKS WILL NOT BE ACCEPTABLE.
- THE WORK CONTAINED HEREIN SHALL COMPLY WITH TITLE 22 SECTION 64572 OF THE CALIFORNIA CODE OF REGULATIONS. REFER TO WATER MAIN SEPARATION REQUIREMENTS DETAIL.
- ALL HARDWARE FOR BURIED PIPE CONNECTIONS SHALL BE STAINLESS STEEL REGARDLESS OF TYPE (RESTRAINED MJ, FLANGE, ETC.).
- NEW WATER MAINS, TANKS, AND TREATMENT EQUIPMENT SHALL BE DISINFECTED AND TESTED IN ACCORDANCE WITH THE SPECIFICATIONS PRIOR TO BEING PLACED INTO SERVICE.

GRADING

- THE WORK EMBRACED HEREIN SHALL BE DONE IN ACCORDANCE WITH THE APPROPRIATE PROVISIONS OF CHAPTER 33 OF 2019 CALIFORNIA BUILDING CODE AS ADOPTED.
- THE CONTRACTOR SHALL OBTAIN WRITTEN AUTHORIZATION FROM ANY PROPERTY OWNER GIVING HIM PERMISSION TO ENTER HIS PROPERTY FOR THE PURPOSES OF CONSTRUCTING THE IMPROVEMENTS DELINEATED ON THE PLANS AND TRANSITIONS THERETO OR STAGING MATERIALS AND EQUIPMENT TO SUPPORT CONSTRUCTION. CONTRACTOR SHALL SUBMIT A LETTER SIGNED BY THE PROPERTY OWNER THAT THE PROPERTY HAS BEEN PROPERLY RESTORED TO ITS PRE-CONSTRUCTION CONDITION.
- ANY DIRT OR DEBRIS TRACKED ONTO ANY EXISTING ROAD FROM THIS PROJECT SHALL BE CLEANED OFF AT THE END OF EACH WORKING DAY TO THE SATISFACTION OF THE CITY.
- BEFORE COMMENCING WORK, THE CONTRACTOR SHALL NOTIFY ALL UTILITY AUTHORITIES OR UTILITY COMPANIES HAVING POSSIBLE INTEREST IN THE WORK OF THE CONTRACTOR'S INTENTION TO EXCAVATE PROXIMATE TO EXISTING FACILITIES AND THE CONTRACTOR SHALL VERIFY THE LOCATION OF ANY UTILITIES IN THE WORK AREA. THE CONTRACTOR SHALL NOTIFY U.S.A. TWO (2) DAYS PRIOR TO BEGINNING ANY EXCAVATION.
- PROVIDE THE CITY OF TURLOCK WITH "AS BUILT" PLANS UPON COMPLETION OF GRADING
- ANY VERTICAL CUT OR FILL DIFFERENTIAL EQUAL TO OR GREATER THAN TWELVE (12) INCHES BETWEEN ADJACENT PROPERTIES SHALL BE SUPPORTED BY AN APPROVED RETAINING WALL.
- DIFFERENTIALS LESS THAN TWELVE (12) INCHES ARE TO HAVE A MAXIMUM SLOPE OF ONE (1) VERTICAL TO TWO (2) HORIZONTAL.
- GRADING CONTRACTOR SHALL REMOVE ALL ORGANIC MATTER, DEBRIS, AND OTHER DELETERIOUS OR EXCESS MATERIAL FROM THE SITE AND DISPOSE OF AT AN APPROVED LOCATION. SUBSURFACE DEBRIS NOT VISIBLE FROM THE SURFACE THAT IS NOT SUITABLE TO REMAIN ONSITE OR USED AS BACKFILL MATERIAL SHALL BE REMOVED AT ENGINEER'S DIRECTION AS EXTRA WORK.
- CONTRACTOR SHALL PRESERVE SURVEY MONUMENTS TO THE EXTENT POSSIBLE. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY SURVEY MONUMENTS THAT WILL BE DISTURBED AS A RESULT OF CONSTRUCTION. MONUMENTS THAT MAY BE DISTURBED BY CONSTRUCTION WILL BE RESET BY A LICENSED LAND SURVEYOR RETAINED BY THE OWNER OR ENGINEER.
- THE CONTRACTOR SHALL MAKE ADEQUATE PROVISION FOR DUST CONTROL FOR THE DURATION OF THE WORK. DUST CONTROL MEASURES SHALL BE FULLY AND ADEQUATELY CARRIED OUT ON WEEKDAYS, WEEKENDS AND HOLIDAYS, AND WHEN NECESSARY, BEFORE OR AFTER NORMAL WORKING HOURS.
- PRIOR TO THE LAYING OF THE SUB BASE OR BASE ON THE ROADWAY, THE CITY'S ENGINEER SHALL CERTIFY THAT THE SUB GRADE ELEVATIONS ARE IN CONFORMANCE WITH THE APPROVED PLANS.
- ALL SEWER, STORM DRAIN AND UTILITY MANHOLES AFFECTED BY THIS PROJECT SHALL BE ADJUSTED TO GRADE AS NECESSARY BY THE CONTRACTOR AND INCLUDED IN THIS WORK. ALL WATER MAIN VALVES (CAP AND LID) SHALL BE ADJUSTED TO GRADE AS NECESSARY BY THE CONTRACTOR AND INCLUDED IN THIS WORK.
- THE COSTS OF ALL REPEAT TESTING REQUIRED FOR ACCEPTANCE OF WORK SHALL BE FULLY BORNE BY THE CONTRACTOR.
- PERMANENT TRENCH RESURFACING TO BE PER CITY STANDARD, OR AS DETAILED.
- TEMPORARY TRENCH RESURFACING TO BE A MINIMUM 4" THICK COLD MIX.
- TRENCH CUTS IN EXISTING STREETS THAT ARE NOT TO BE RECONSTRUCTED OR OVERLAID SHALL HAVE PERMANENT TRENCH RESURFACING INSTALLED WITHIN SEVEN (7) DAYS AFTER INITIAL STREET CUT.
- OVER EXCAVATE 1 FOOT BELOW BOTTOM OF FOUNDATIONS (NOT INCLUDING ANY PIER TYPE FOOTING) AND EXTEND OUT TO 5 FEET MAX BEYOND THE STRUCTURE, BUT NOT BEYOND ANY ADJACENT SITE WORK, AND NOT WITHIN 2 FEET OF ANY ADJACENT STRUCTURE.

PIPING SCHEDULE											
PROCESS ABBREVIATIONS	SERVICE	LOCATION	CLASSIFICATION	PIPE MATERIAL	THICKNESS/ PRESSURE CLASS	RESTRAINED JOINTS	JOINTS/ FITTINGS	TEST PRESSURE	TEST METHOD	LINING	COATING
SD	STORM DRAIN	BURIED	GRAVITY	PVCG	PER §40 05 00	UNRESTRAINED	PO or MJ	3 PSI	PER §40 05 20	—	—
PW	POTABLE WATER	BURIED	PRESSURE	DIP	PER §40 05 00	RESTRAINED	PO or MJ	100 PSI	PER §40 05 20	CM	BSC, PEE
		BURIED	PRESSURE	C900	PER §40 05 00	RESTRAINED	PO or MJ	100 PSI	PER §40 05 20	—	—

C900	AWWA C900 STANDARD	FLG	FLANGE	BSC	BITUMINOUS SEAL COATED PER AWWA C105	FBE	FUSION BONDED EPOXY 40 05 00
DIP	DUCTILE IRON PIPE	GE	GROOVED END	CM	CEMENT MORTAR PER AWWA C104	PEE	POLYETHYLENE ENCASEMENT 40 05 00 PER AWWA
PVCG	POLYVINYL CHLORIDE GRAVITY	MJ	MECHANICAL JOINT				
WSP	WELDED STEEL PIPE	PO	PUSH ON JOINT	EP	EPOXY POLYURETHANE 40 05 00 SYSTEM 2		

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LICENSE NO:
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CHECKED BY:
RKB

DATE: NOV 2020

JOB NO: 229220006

PROJECT NO:

PHASE: CD

0"=1"

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SHEET
G-3

3 OF 57

11-17-2020

KWM

DATE

11-12-2020

KWM

DATE

ADDENDUM 3

ADDENDUM 2

REVISION

NO.

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PROFESSIONAL ENGINEER

KEITH MORTENSEN

No. 75865

CIVIL

STATE OF CALIF.

RES. FID. NO.

DATE SIGNED: _____

CITY WIDE CHLORINATION

CITY OF TURLOCK

CITY PROJECT NO. 2020-79

GENERAL

GENERAL NOTES

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DATE

11-12-2020

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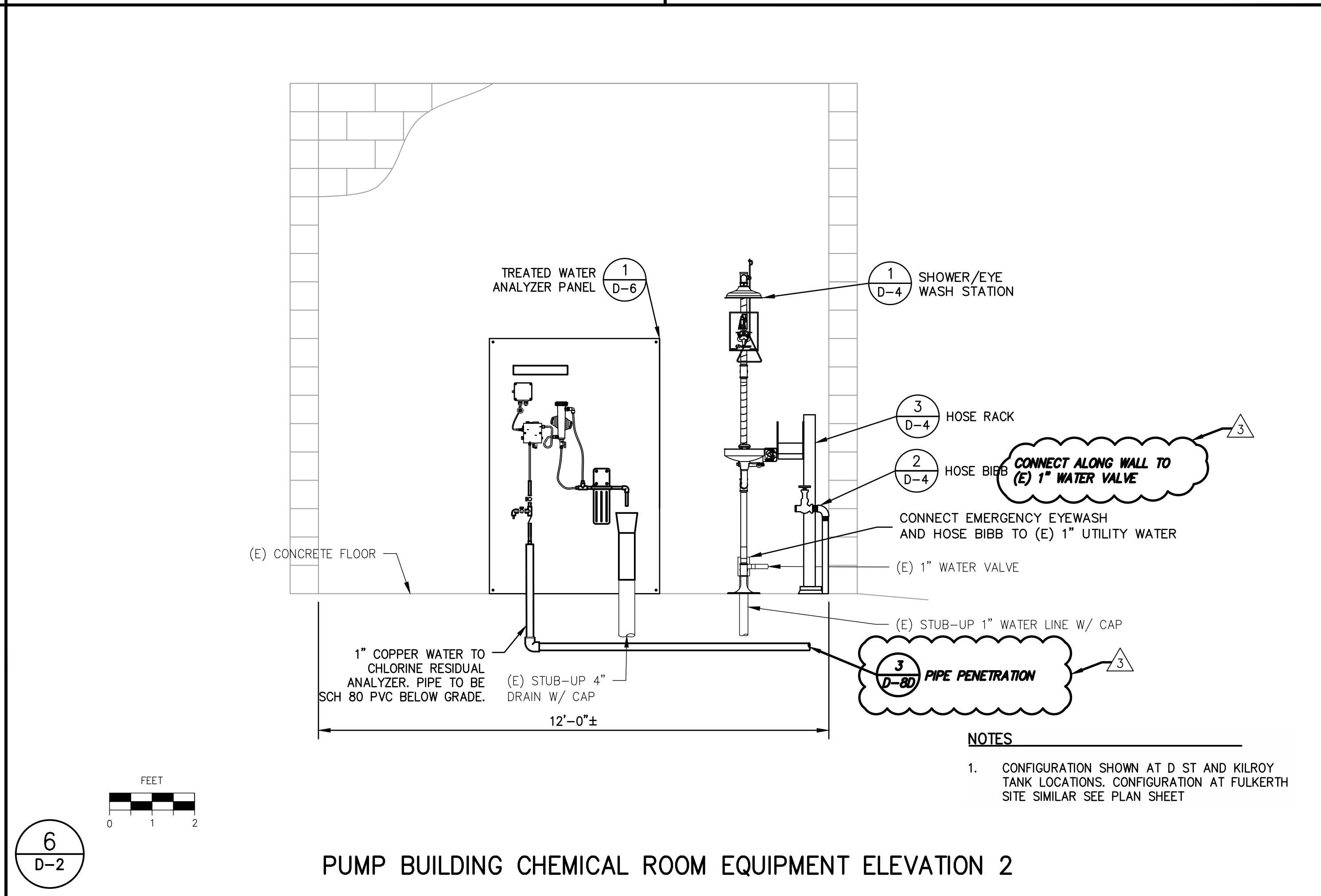
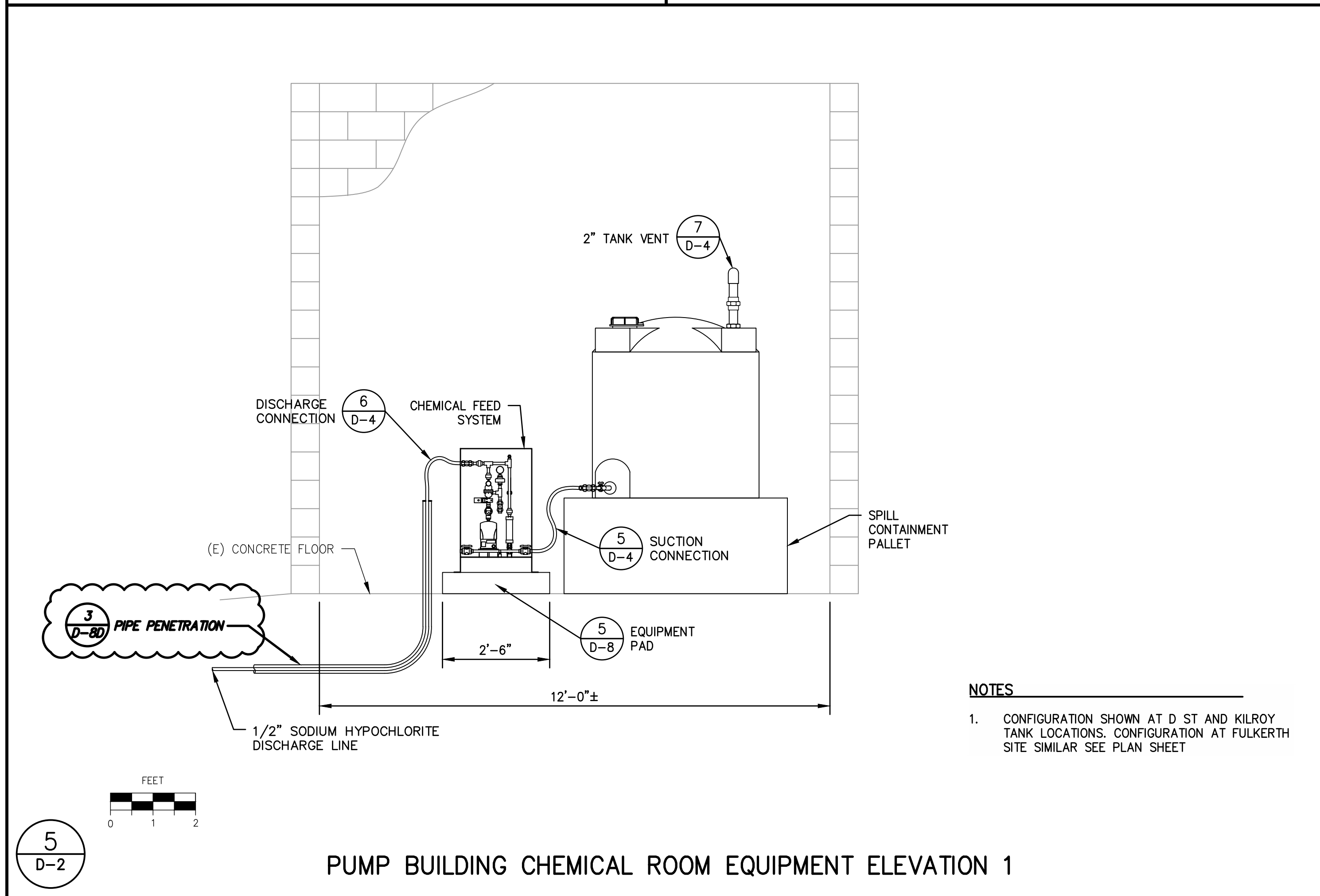
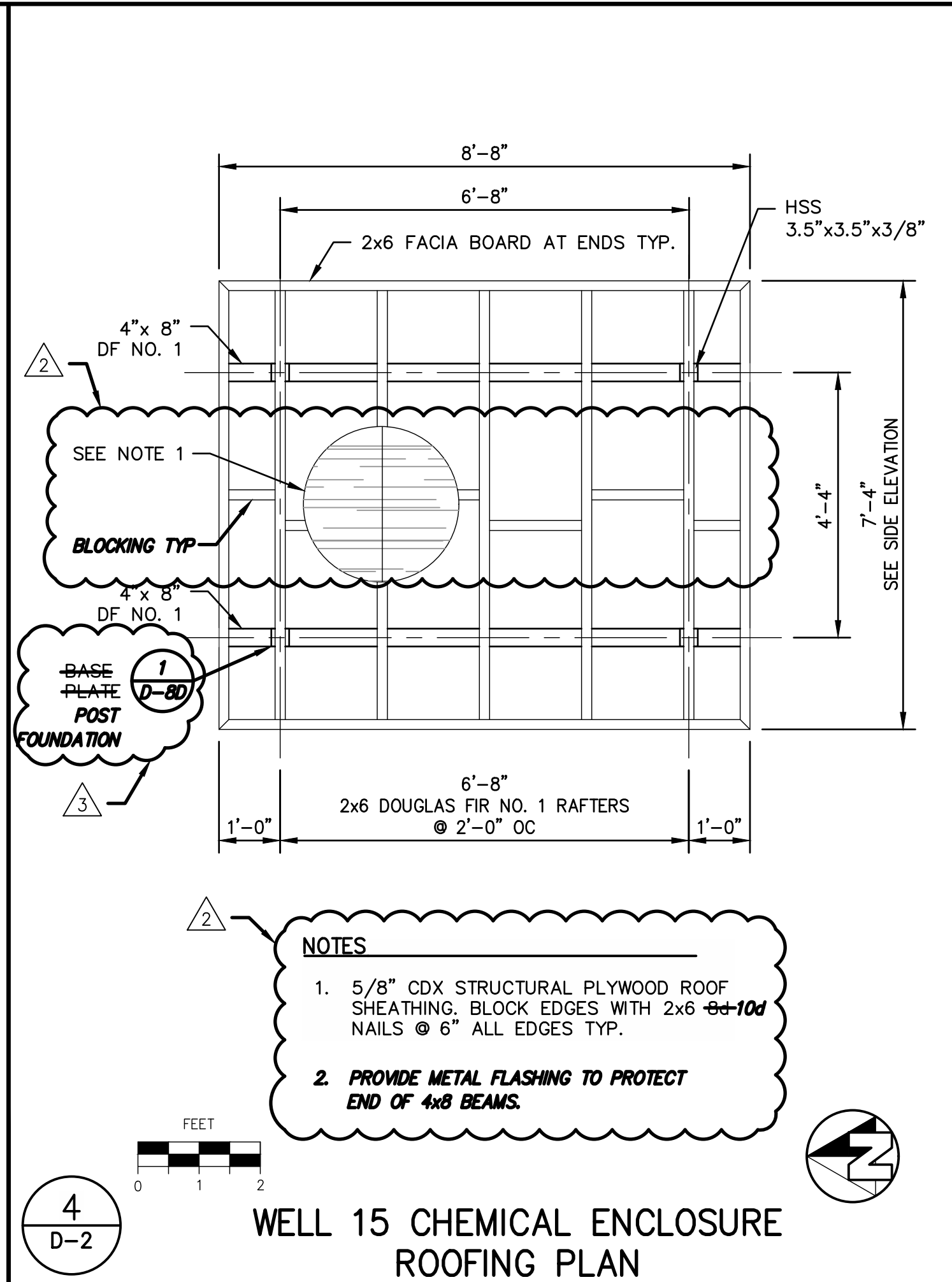
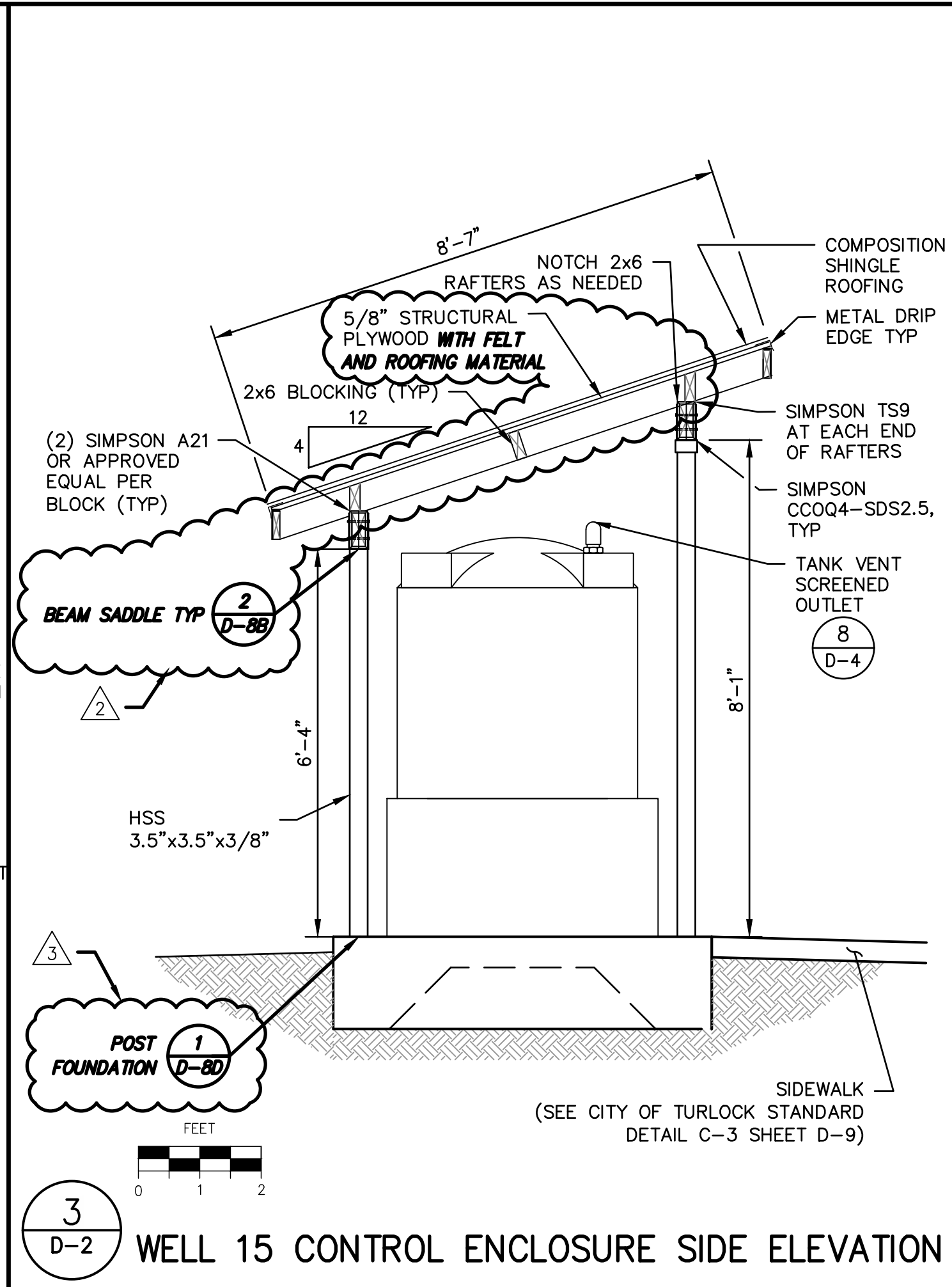
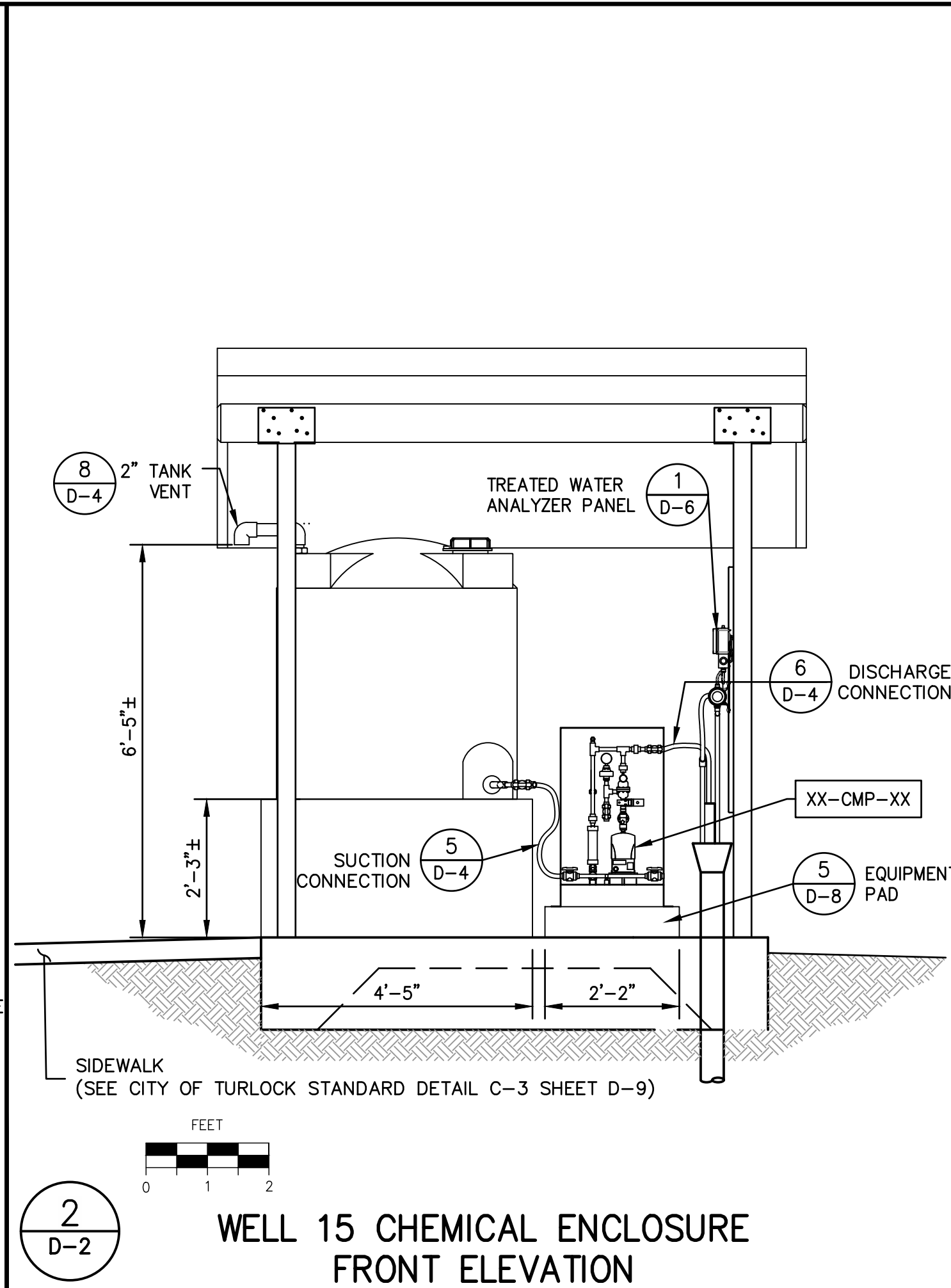
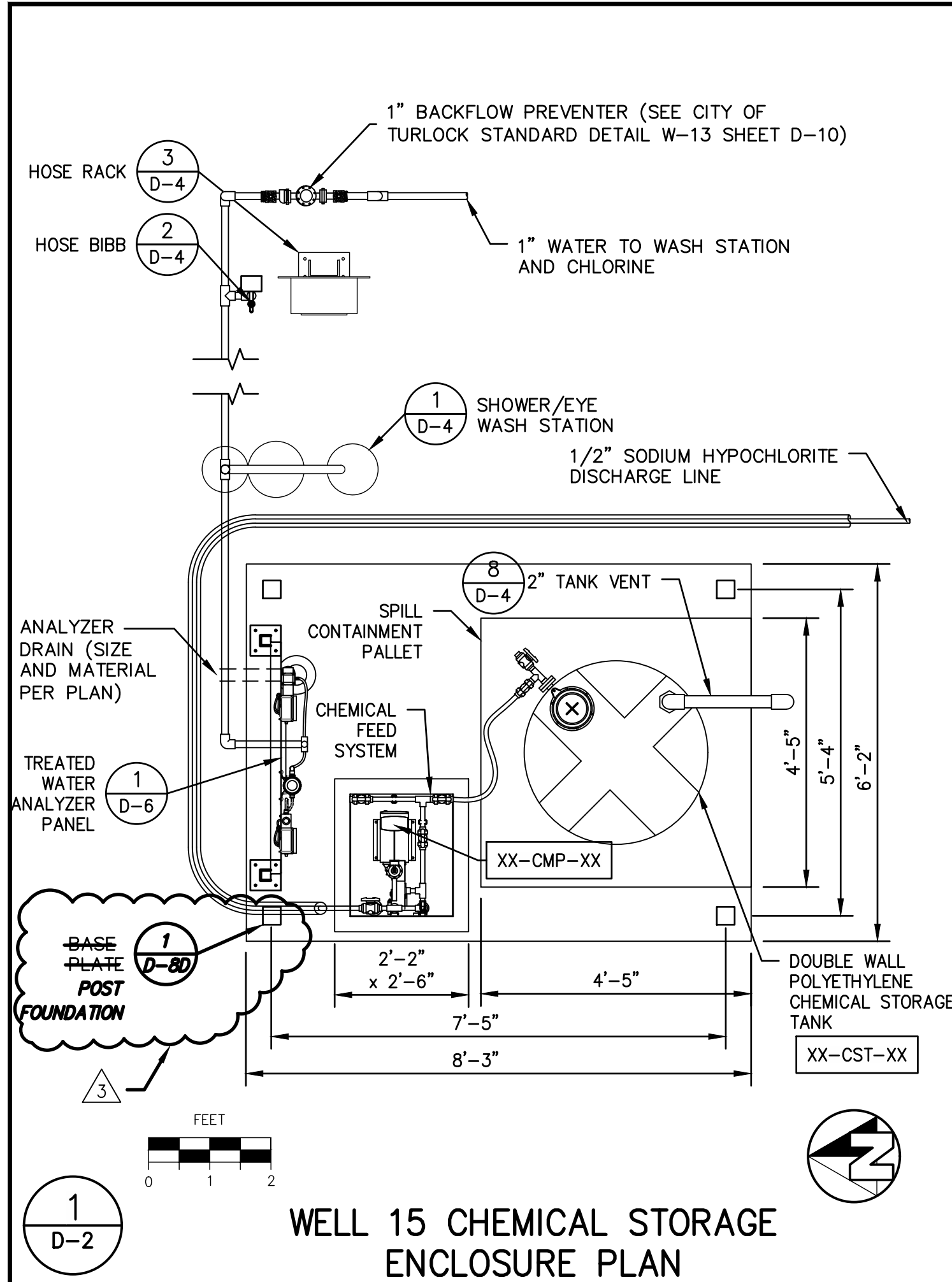
ADDENDUM 3

ADDENDUM 2

REVISION

NO.

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SHEET **D-2**

27 OF 57

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ADDENDUM 3
ADDENDUM 2

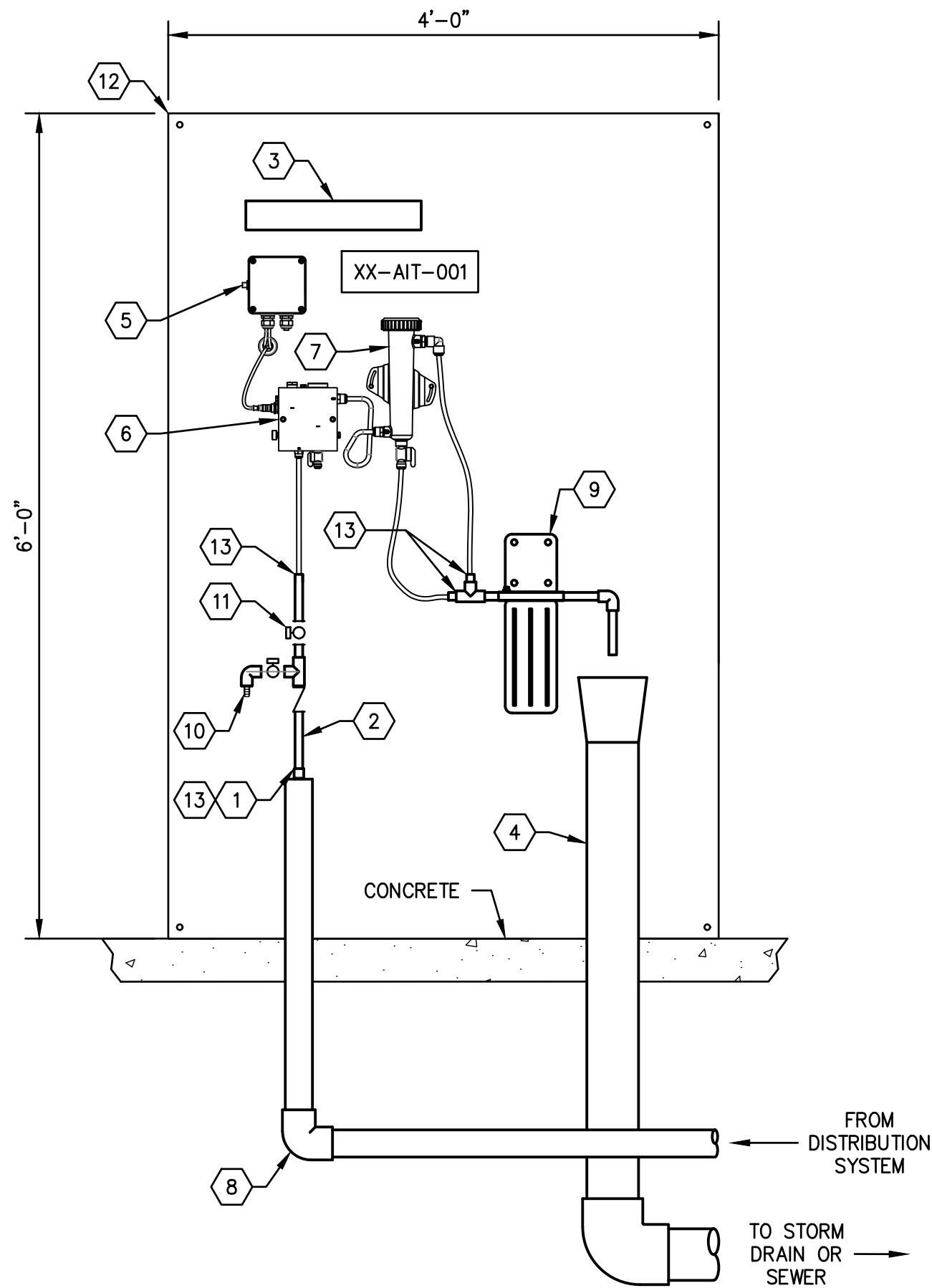
NO. BY DATE

REVISION

DATE SUBMITTED

CITY WIDE CHLORINATION
CITY OF TURLOCK
CITY PROJECT NO. 2020-79
DETAILS

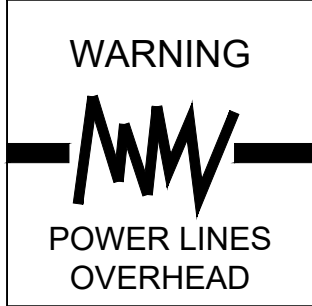
CHLORINATION ENCLOSURE DETAILS



MATERIAL LIST	
ID	DESCRIPTION
1	1" x 1/2" REDUCER
2	ANALYZER FEED WATER PIPE
3	ANALYZER NAMEPLATE (TYP)
4	DRAIN LINE (SIZE & MATERIAL PER PLAN)
5	CHLORINE ANALYZER CONTROLLER
6	CHLORINE FLOW CELL
7	pH FLOW CELL
8	1" SITE WATER
9	WATTS 70,000 GALLON ACTIVATED BLOCK CARTRIDGE WITH HEAVY DUTY FILTER HOUSING OR APPROVED EQUAL
10	SAMPLE TAP (TYP)
11	BALL VALVE (TYP)
12	1/2" BACKBOARD, SEE NOTE 2
13	TUBING ADAPTER

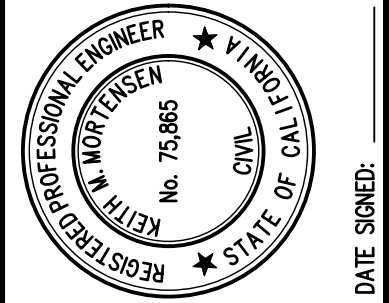
NOTES

- ALL ANALYZERS TO BE EQUIPPED WITH MANUFACTURER'S RECOMMENDED SAMPLE CONDITIONING ACCESSORIES.
- ANALYZER BACKBOARD TO BE COVERED WITH WATERPROOF POLYMER, OR EXTERIOR GRADE PLYWOOD WITH 12 GAUGE STAINLESS STEEL SHEET FROM THE FLOOR TO THE HIGHEST PIECE OF EQUIPMENT. RIGIDLY MOUNT EQUIPMENT, ACCESSORIES, CABLES, AND TUBING/PIPES TO BACKBOARD USING STAINLESS STEEL CLIPS AND FASTENERS. MOUNTING USING ADHESIVES IS NOT ACCEPTABLE. MOUNT BACKBOARD TO CMU WALL OR TO TWO UNISTRUT SUPPORTS.
- ELECTRICAL JUNCTION BOXES FOR POWER AND SIGNAL TO/FROM THE ANALYZERS SHALL BE MOUNTED TO THE BACKBOARD NEAR THE ANALYZERS WITH CONDUIT/CABLE ROUTED NEATLY BETWEEN THE JUNCTION BOXES AND ANALYZERS.



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CITY WIDE CHLORINATION
CITY OF TURLOCK
CITY PROJECT NO. 2020-79
DETAILS

EST. 1968
PROVOST & PRITCHARD
CONSULTING GROUP
An Employee Owned Company
288 WEST CROWMELL AVENUE
FRESNO, CALIFORNIA 93711-6162
559/449-2700 FAX 559/449-2715
www.ppg.com

DESIGN ENGINEER:
KEITH MORTENSEN
LICENSE NO:
75865

DRAFTED BY: JMN
CHECKED BY: RKB

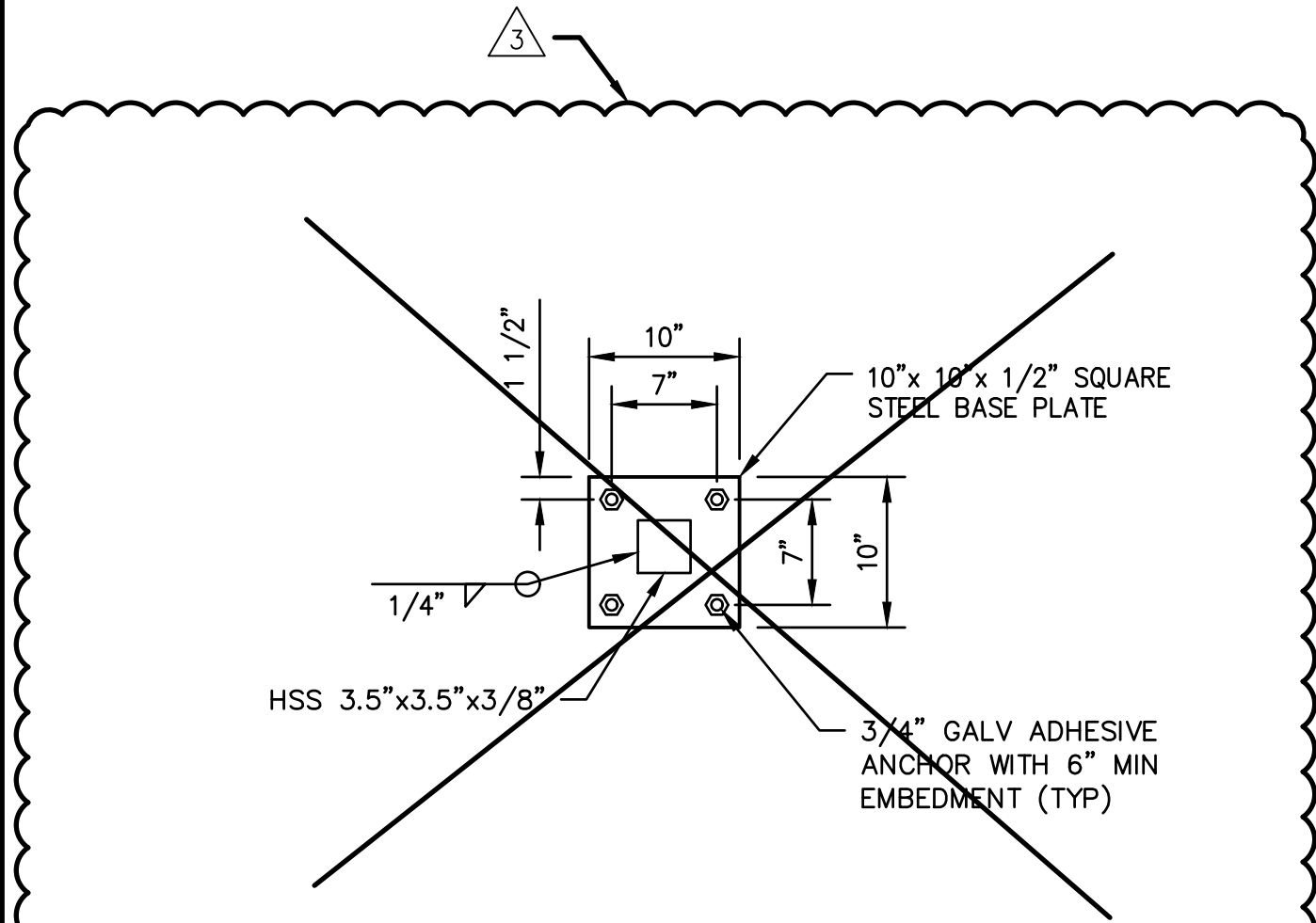
DATE: NOV 2020
JOB NO: 229220006

PROJECT NO:
PHASE: CD

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ORIGINAL SCALE SHOWN IS
ONE INCH. ADJUST SCALE FOR
REDUCED OR ENLARGED PLANS.

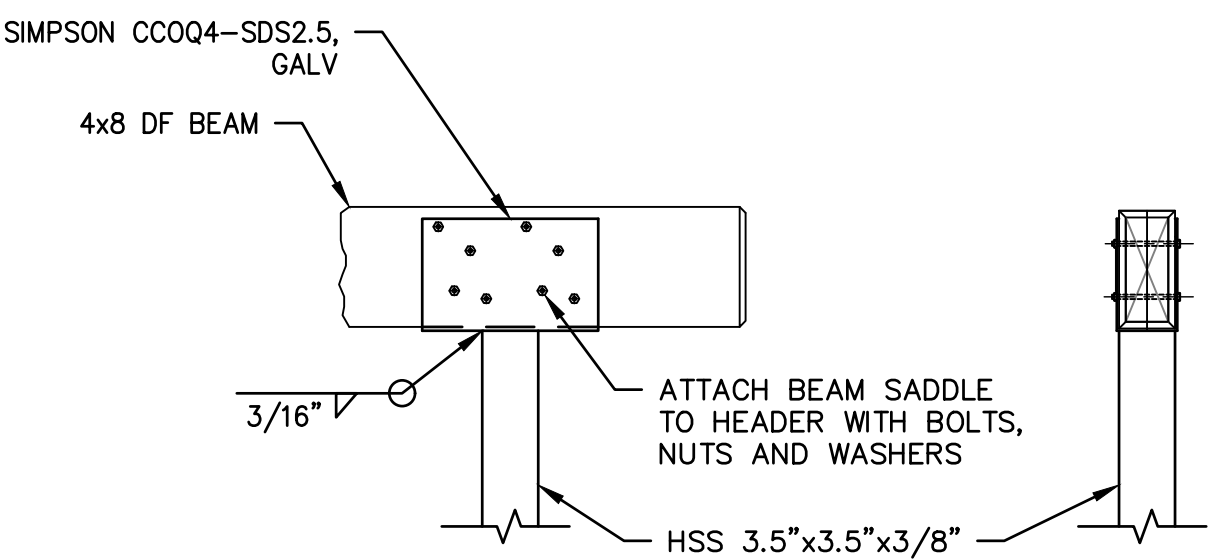
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D-6

31 OF 57



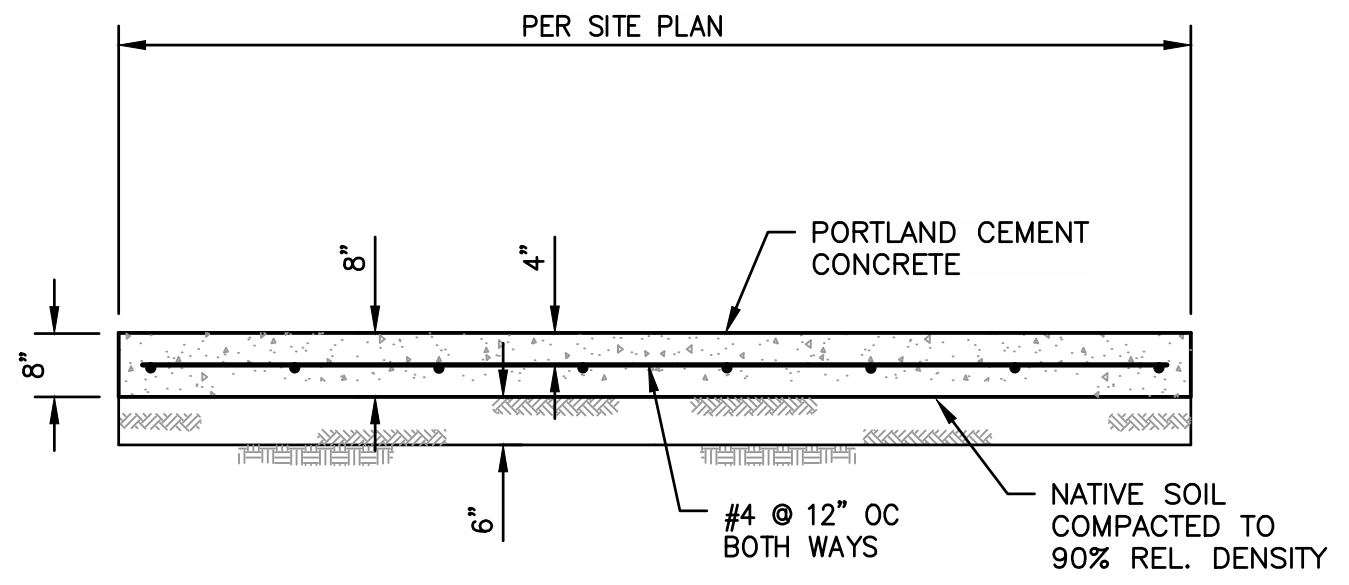
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STEEL SUPPORT COLUMN



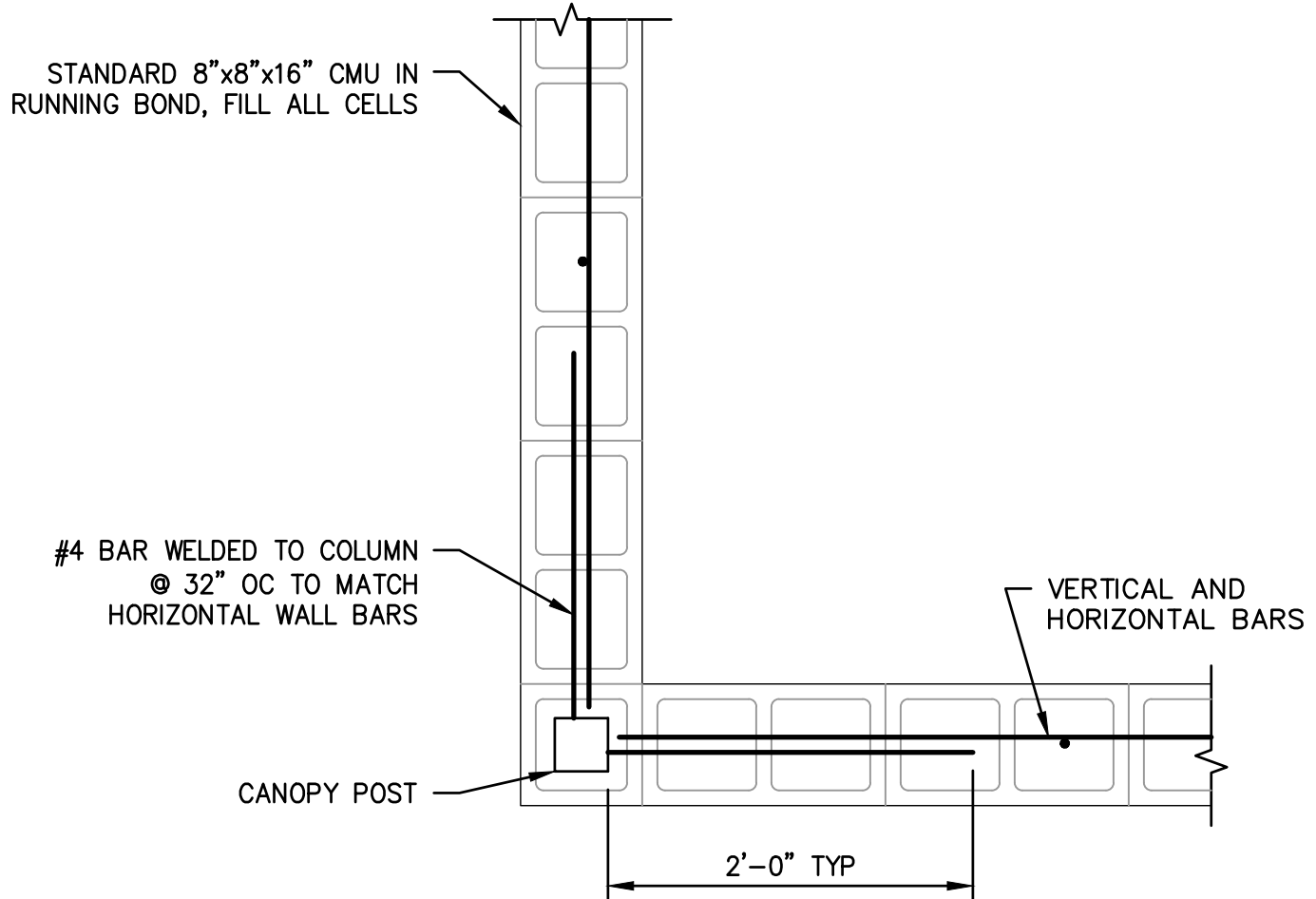
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BEAM SADDLE



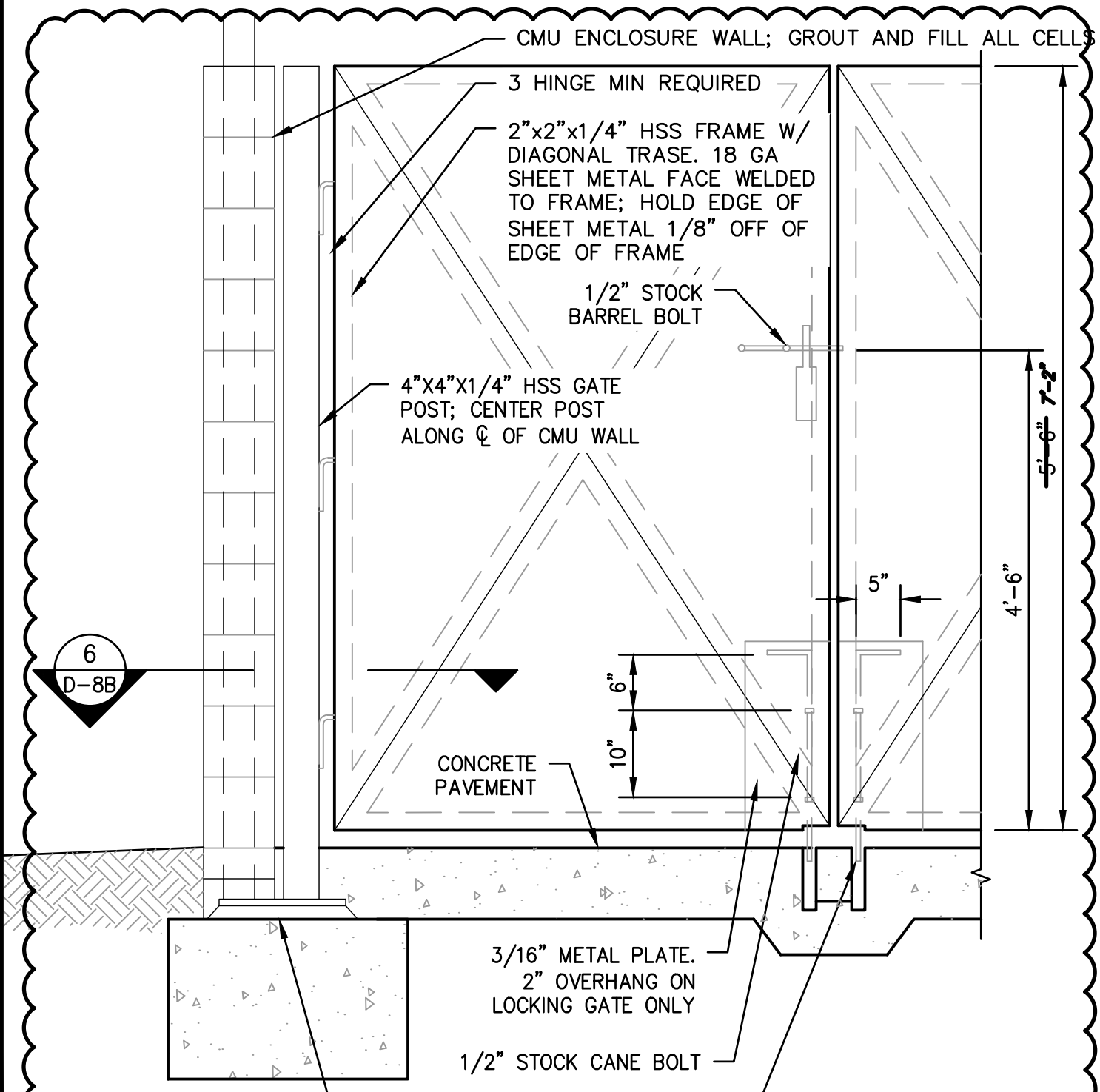
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CONCRETE FLOOR SLAB



4
D-8B

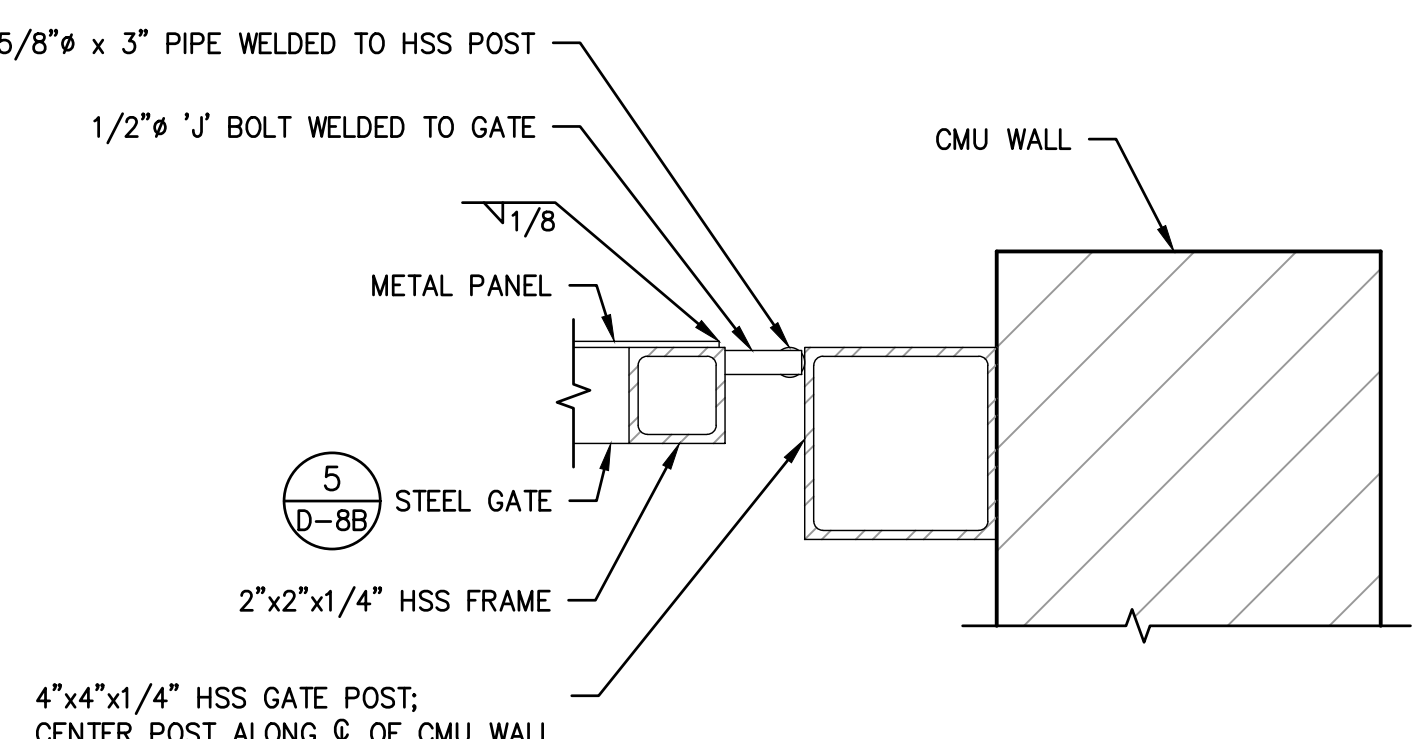
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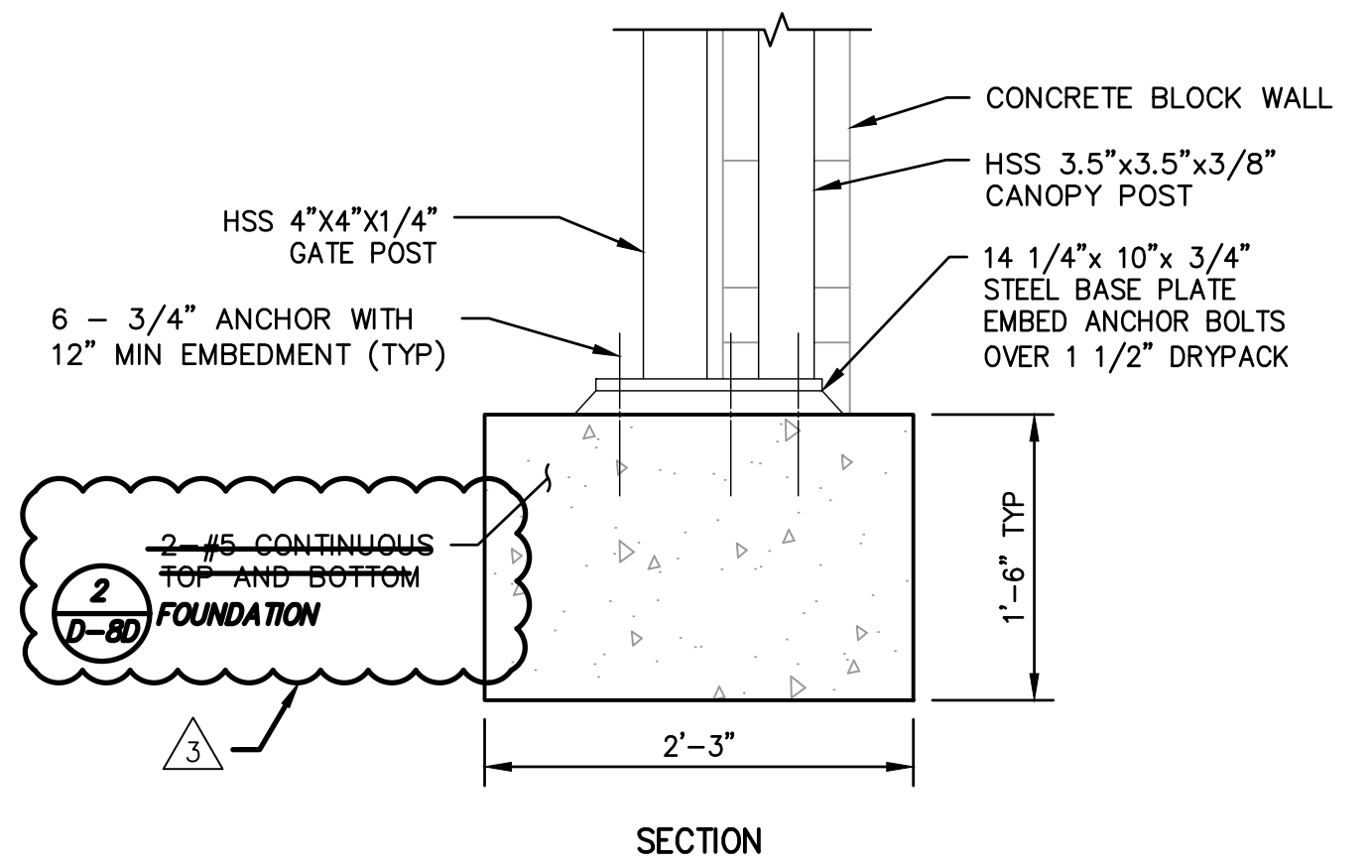
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GATE/POST AT ENCLOSURE



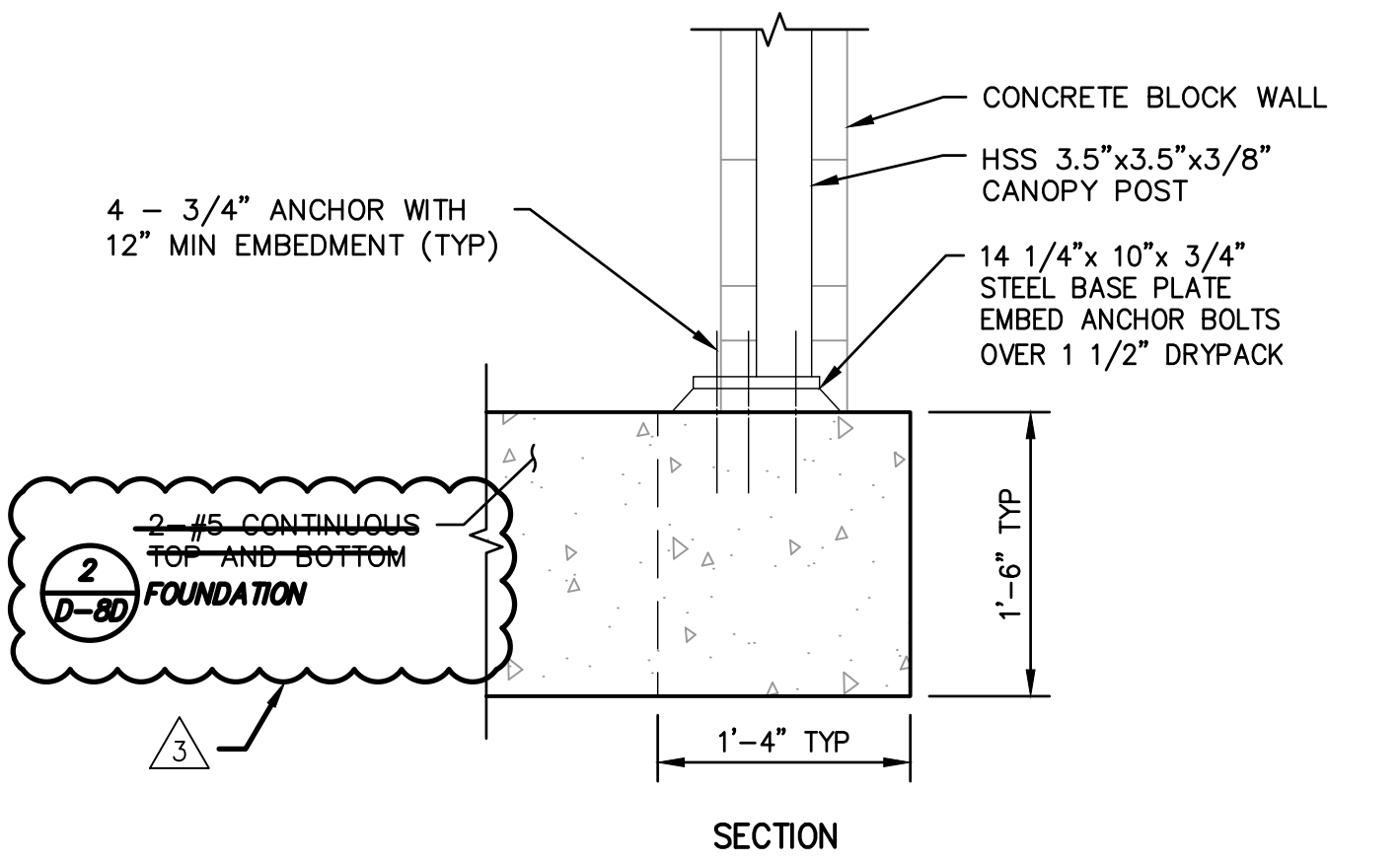
6
D-8B

ENCLOSURE GATE



7
D-8B

FOUNDATION AND FRONT SUPPORT



8
D-8B

FOUNDATION AND REAR SUPPORT

- NOTES
1. SLIDE BOLT IS NOT REQUIRED.
 2. CANE BOLT REQUIRED ON EACH GATE MOUNTED ON THE OUTSIDE.
 3. 2" OVERHANG ON METAL PLATE IS REQUIRED

11-17-2020

KWM

BY

DATE

11-12-2020

KWM

REVISION

NO.

ADDENDUM 3

ADDENDUM 2

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10/16/2020

PROF. ENGINEER

KEITH MORTENSEN

NO. 75865

CIVIL

STATE OF CALIF.

RES. 10/11/20

DATE SIGNED

CITY WIDE CHLORINATION

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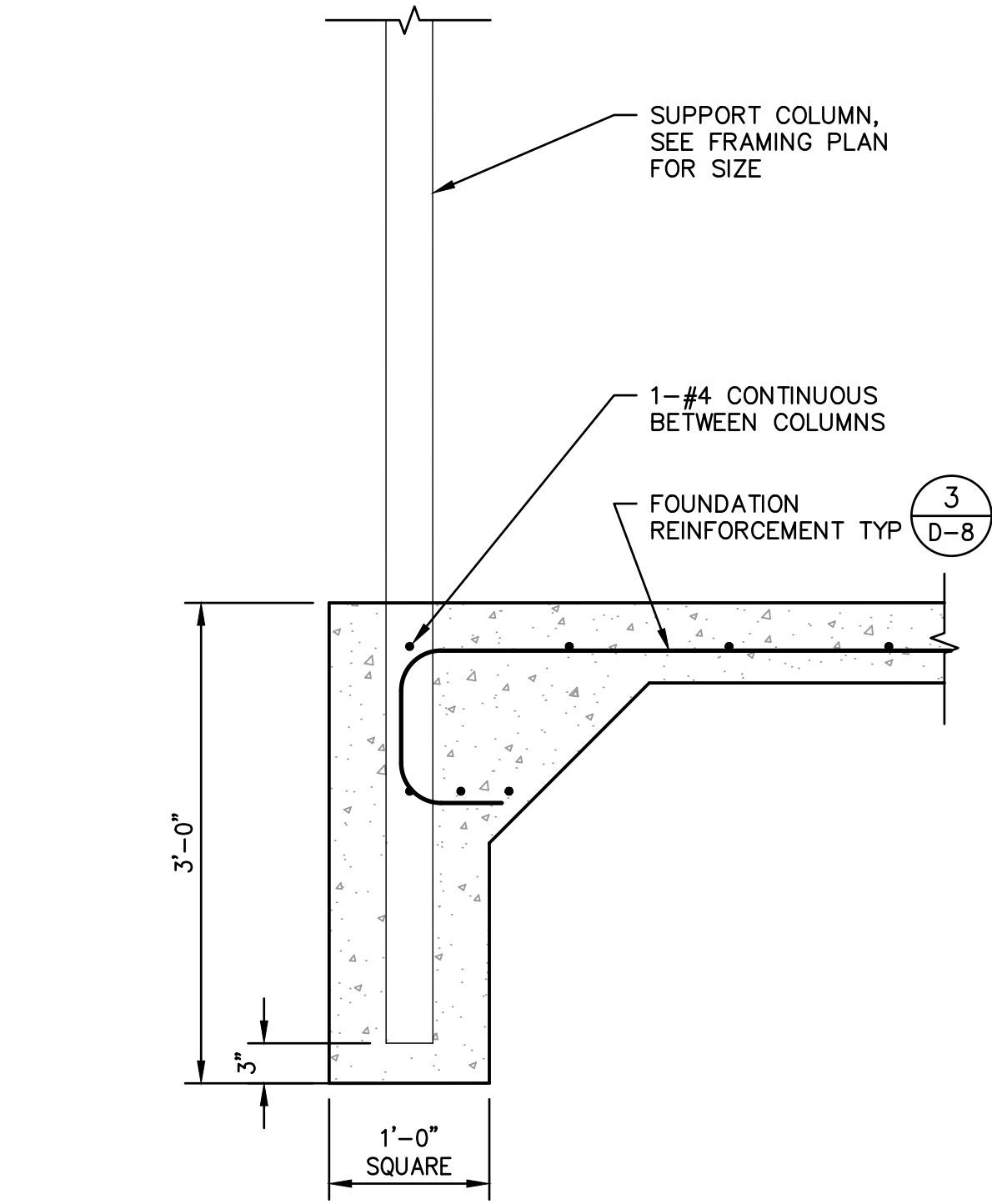
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OF

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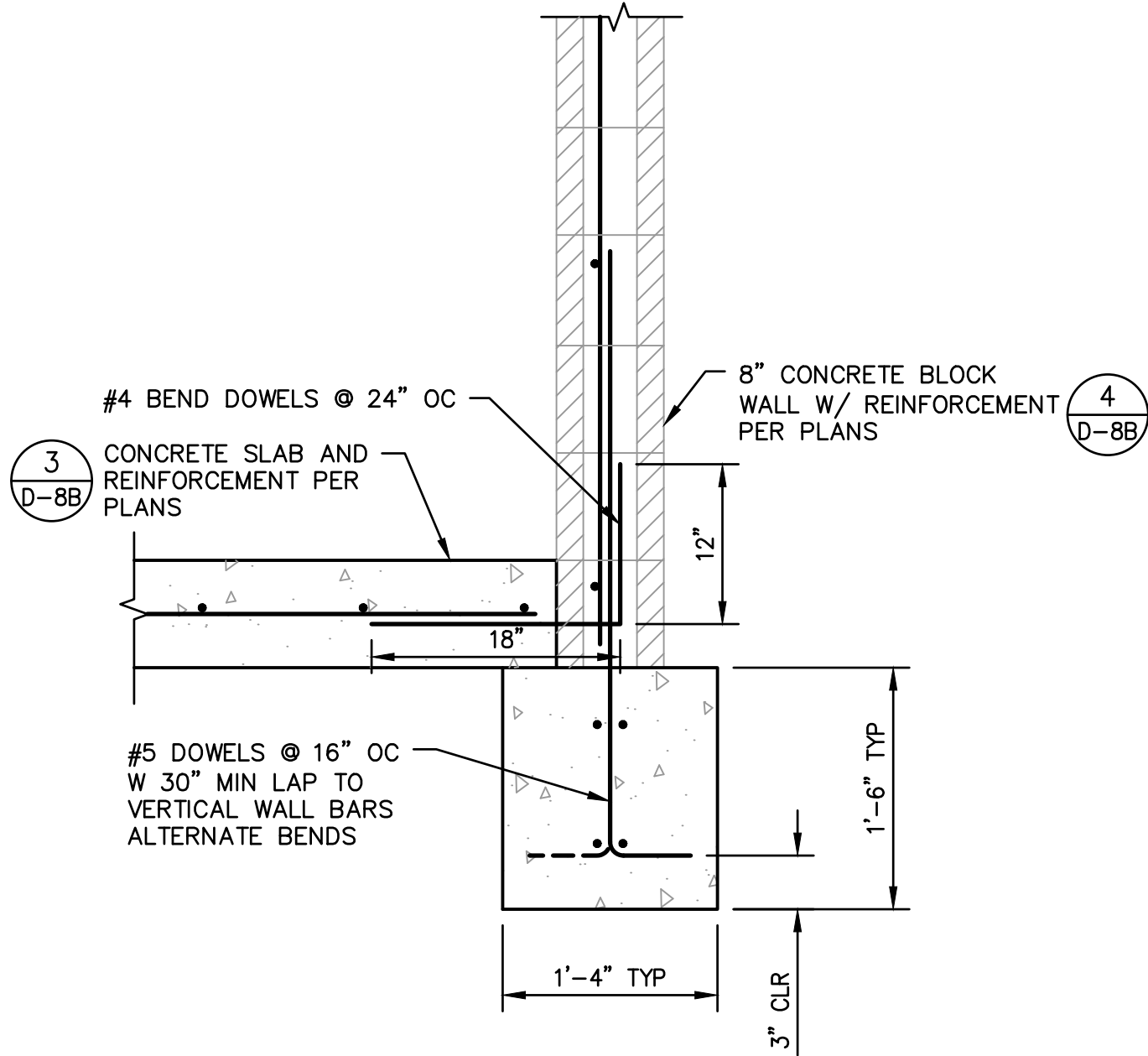
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1
D-8D

NOT TO SCALE

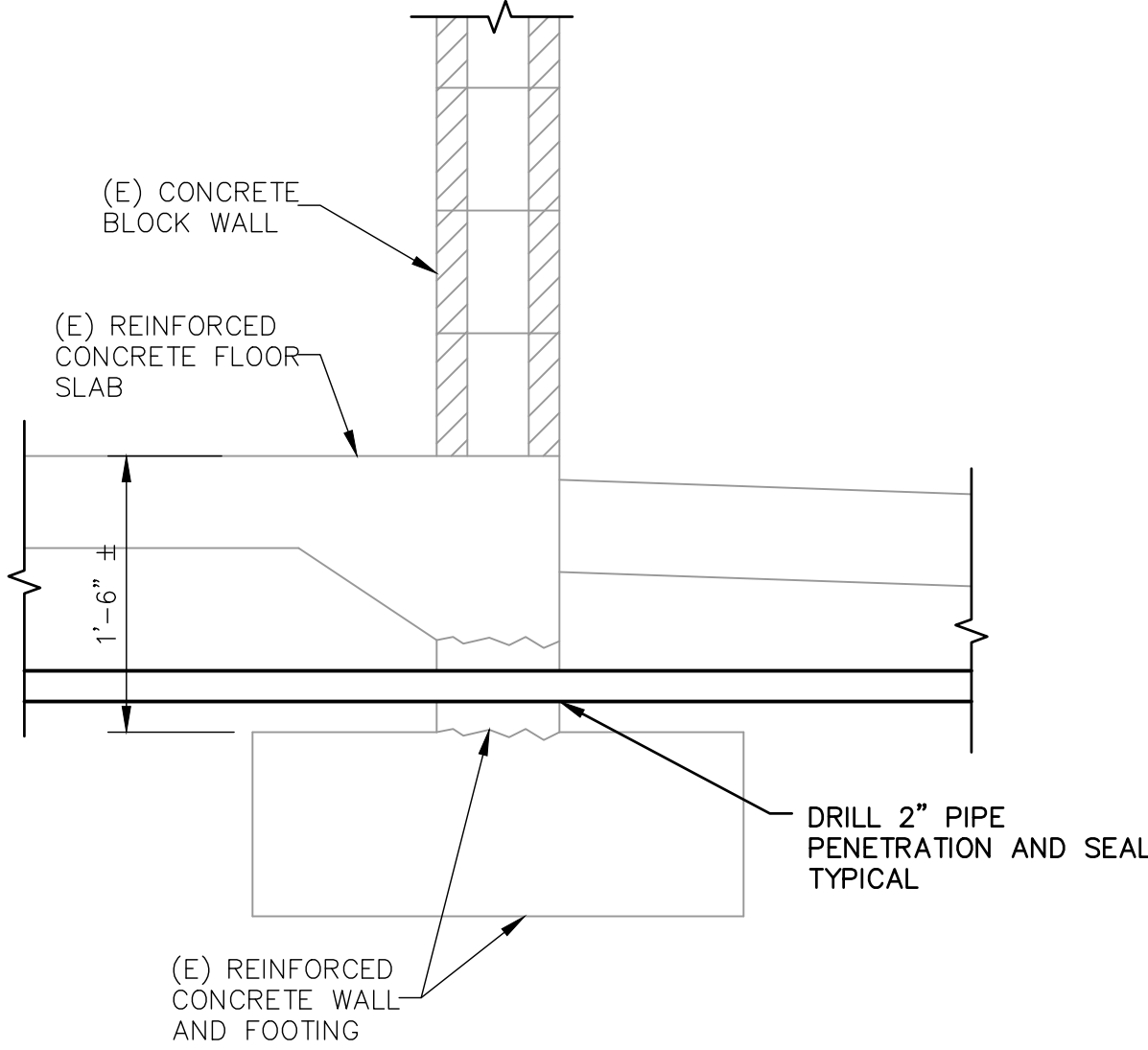
WELL 15 CANOPY POST



2
D-8D

NOT TO SCALE

FOUNDATION



3
D-8D

NOT TO SCALE

PIPE PENETRATION

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ADDENDUM	NO.	REVISION	BY	DATE
1	ADDENDUM 3		KWM	11-17-2020

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