ADDENDUM NO. 1

TO CONTRACT DOCUMENTS

City of Los Banos
Final Kilometer Sewer Trunk Line Replacement Project

March 14, 2025

This **Addendum No. 1** consists of 58 pages, and must be signed, dated, and submitted along with the Bid Documents. 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: CONTRACT DOCUMENTS – BID SCHEDULE AND SPECIAL PROVISIONS SECTION 24 – BID ITEM DESCRIPTIONS

Contract Document – Bid Schedule and Special Provision Section 24 – Bid Item Description shall be replaced in its entirety with the revised Contract Document – Bid Schedule and Special Provision Section 24 – Bid Item Description attached.

ITEM NO. 2: SECTION 01 57 50 – CONSTRUCTION STAKES, LINES AND GRADES

1. Is the City providing all the construction staking for the project or just the project control monuments?

   Response: Refer to Section 01 57 50 on the Project Specifications. The City will only provide Project control monuments as shown on the Plans. Engineer or Owner's representative will provide one set of grade control stakes.

ITEM NO. 3: SECTION 03 36 00 – CONCRETE LINING FOR CORROSION PROTECTION

1. Are the Manholes to be coated?

   Response: Coating for Manholes is an alternate bid item to be paid as Lump Sum. Refer to REVISED PER ADDENDUM 1 Bid Schedule and Special Provision Section 24 – Bid Item Description. Refer to Section 03 36 00 – Concrete Lining for Corrosion Protection attached.

ITEM NO. 4: SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK

1. What material is to be used to backfill around new manholes?

   Section 31 05 00 – Common Work Results for Earthwork shall be replaced in its entirety with the revised Section 31 05 00 – Common Work Results for Earthwork attached.

ITEM NO. 5: SECTION 31 23 17 – TRENCHING BACKFILLING AND COMPACTING

Section 31 23 17 2.4.C.1. The Bedding and Backfill requirements shall be revised as follows:

Material property requirements for bedding and backfilling of manholes shall adhere Detail 7 in Sheet D1 – City of Los Banos Standards. Bedding material property shall adhere to Class 1 Bedding. Backfill material property shall adhere to Class 1 Backfill.

Section 31 23 17 – Trenching Backfilling and Compacting shall be replaced in its entirety with the revised Section 31 23 17 – Trenching Backfilling and Compacting attached.

ITEM NO. 6: PRE-BID ATTENDANCE SHEET

See Pre-Bid Attendance Sheet attached.

ITEM NO. 7: ADDITIONAL ITEMS, CLARIFICATIONS, AND QUESTIONS FROM PRE-BID MEETING

1. For the abandonment of the existing sewer pipeline, will the City allow for Cellular Concrete or Controlled Low Strength Material (CLSM) to be used instead of 2 sack slurry?

   Response: The existing 24-inch sanitary sewer pipeline may be abandoned in place using Cellular Concrete or Controlled Low Strength Material instead of 2 sack slurry cement.

2. Are plan sheets S5 – Turnout Structure and Plan Sheet S6 - Pump Sump part of this project?

   Response: The Turnout Structure and Pump Sump are referenced within the plan set in Sheet C9 – San Luis Canal Turnout and included in the Bid Item #10 in Section 24 of the Special Provisions within the Project Specifications.

3. Plan sheets C9 and C10 show NIC. Is everything on these two plan sheets excluded from this contract?

   Response: The Turnout Structure, 36-inch canal gate, 6-inch air vent, 36-inch x 3/8” Wall AWWA C200 CMLC Steel Pipe, Pump Sump Structure, and Rip Rap with Geotextile Fabric referenced within the plan set in Sheet C9 – San Luis Canal Turnout are included in this contract. Refer to Bid Item #10 in Section 24 of the Special Provisions within the Project Specifications

   The 30-inch x 3/8” Wall AWWA C200 CMLC Steel Pipe, Bends, Blind Flanges & Appurtenances, and Rip Rap with Geotextile Fabric referenced within the plan set in Sheet C10 – San Luis Canal Outlet are included in this contract. Refer to Bid Item #11 in Section 24 of the Special Provisions within the Project Specifications.

4. The City is supplying the 48” RGRCP, does that include 45-degree bends and fittings?

   Response: Yes, the City is supplying the 48-inch RGRCP ASTM C361 C25 and Gaskets. Contractor is responsible for constructing the field bends as show in Detail 2 in Sheet S2 – Structural Details and in accordance with the Project Plans and Specifications.

5. Siphon underneath the San Luis Canal, what are the existing pipes made of?

   Response: Existing 24-inch and 30-inch sanitary sewer pipelines are made of unknown material. The City believes that existing 24-inch and 30-inch sanitary sewer pipelines are made of concrete. The 24-inch and 30-inch sanitary sewer pipelines were built in late 80s or early 90s. The City only has design plans and does not have as-builts that reflect the material of the existing 24-inch and 30-inch sanitary sewer pipelines.

6. Plans call for abandoning existing 24-inch sanitary sewer pipeline, does the existing 24-inch sanitary sewer pipeline need to be capped and filled?

   Response: Yes, the existing 24-inch sanitary sewer pipeline shall be filled with Cellular Concrete, Controlled Low Strength Material, or 2 sack slurry cement and capped. The Contractor shall take precaution to prevent any obstruction of the flow area in existing manholes where the existing 24-inch and 30-inch sanitary sewer pipelines tie into the same manhole.

7. Is the field farmed?

   Response: No, the field will not be farmed at the time of construction.

8. Will bypass be required for work in San Luis Canal?

   Response: The canal should be drained, however, dewatering may be required to facilitate construction activities. The removed water will be returned to the canal downstream of the construction area within a reasonable distance.

9. Is there a Geotech report?

   Response: Geotechnical Report for the Project is included in Project Specification Appendices. Refer to Project Specification Appendix B.

10. Is the existing sleeve capped and clean?

    Response: The existing 60-inch RGRCP sleeve under the Santa Fe Canal is capped with a Manufacturer fabricated end cap and slurry sealed.

11. What is the joint length for the 48-inch RGRCP?

    Response: The 48-inch RGRCP ASTM C361 C25 procured by the City will come in 8-foot and 4-foot lengths segments.

12. Who is doing compaction testing and who is paying?

    Response: The City will contract with BSK Associates for compaction testing and will pay for the first test. The Contractor will be responsible for payment of any failed tests that require re-testing.

13. Question regarding engineered fill?

    Response: Reference Item No. 4 in Addendum No.1.

14. What are the bypass requirements for flow and monitoring?

    Response: Reference Section 33 01 33 – Sewer Bypass in the Project Specifications. The combined dry weather sanitary sewer flow rate for the existing 24-inch and 30-inch pipelines is approximately 5.0 million gallons per day or a peak wet weather sanitary sewer flow rate of approximately 12 million gallons per day is expected at the site.

    No field personnel are required for monitoring.

15. Will we need to do anything with the existing pipes at the siphon crossing?

    Response: The Project Plans call for existing 24-inch and 30-inch sanitary sewer pipelines to be protected in place. Contractor shall be responsible for protecting in place existing infrastructure, maintaining sanitary sewer flows to the City Wastewater Treatment Plant. Contractor to determine the best method to protect in place existing infrastructure. Contractor shall be responsible for replacement for any damage to existing 24-inch and 30-inch sanitary sewer pipelines. Existing pipelines shall be replaced according to City and Industry standards.

16. Question about assumed bypass location and spacing?

    Response: Contractor shall be responsible for determining bypass location and spacing to maintain flow and operation of existing City infrastructure at all times during the course of the construction.

17. How much header pipe do they need to lay on the ground?

    Response: Please clarify this question.

18. Are SSMHs shown where bypass is needed?

    Response: Bypass locations are not identified. The Contractor shall determine bypass locations. Manholes are shown on the plan set. Refer to existing infrastructure exhibit attached in Addendum No. 1.

(SEE NEXT PAGE)

Except as expressly amended hereby, all terms and conditions of the Contract Documents shall remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have executed this Addendum on _____, 2025.

By:_____

_____
CONTRACTOR

Kirk Koester, RCE 88513

By:_____

PROVOST & PRITCHARD
CONSULTING GROUP

REMINDER: ***Bids are due prior to 2:00:00 P.M. on Friday March 21st, 2025, at the City of Los Banos City Hall (520 J Street, Los Banos, CA 93635).***

All Project-related questions must be submitted electronically to by Monday March 17th, 2025, before 5:00:00 P.M. The last day to release an addendum will be Wednesday March 19th, 2025.

Attachments:

1. Contract Documents – Bid Schedule (1 Page)
2. Special Provision Section 24 – Bid Items Description (3 Pages)
3. Revised Section 03 36 00 – Concrete Lining for Corrosion Protection (10 Pages)
4. Revised Section 31 05 00 – Common Work Results for Earthwork (16 Pages)
5. Revised Section 31 23 17 – Trenching Backfilling and Compacting (13 Pages)
6. Revised City of Los Banos – Final Kilometer Sewer Trunk Line Replacement Project Sheets (7 Pages)
7. Pre-Bid Attendance Sheet (2 Pages)

24. Bid Item Descriptions

Bid Item No. 1 – Mobilization/Demobilization, Bonds, Insurance and Permits:

Payment for this item shall include full compensation for all labor, materials, tools, equipment and incidentals making up the cost of mobilization, move-in, move-out, all necessary bonds, insurance, permits, licenses, and fees required during the performance of the work as specified. This item also includes demobilization, including the removal of all equipment, supplies, personnel and incidentals from the project at the end of construction. This bid item will be paid based on percentage of bid item amount. Payment for this item shall not exceed 5 percent of the bid item amount. Payment for mobilization shall be made with the first progress payment and shall not exceed 80 percent of the bid item amount. Payment for demobilization shall be made with the last progress payment and shall not be less than 20 percent of the bid item amount. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

Bid Item No. 2 – Worker and Public Protection:

Payment for this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required for protection from caving ground in excavations and other hazards that may occur during construction in conformance with 29CFR1926, Subpart P – Excavations, CAL/OSHA requirements in accordance with the Plans and specifications. This bid item will be paid based on percentage of bid item amount. Payment for this item shall not exceed 2 percent of the bid item amount. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

Bid Item No. 3 – Miscellaneous Facilities and Operations:

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to furnish and install project sign, control all sources of water, including groundwater, storm water, and surface water, necessary to facilitate construction. Such operations covered under this bid item shall include, but are not limited to, unwatering of the canal prism, unwatering excavations, unwatering or temporarily redirecting drainage flows that pass through or are adjacent to the Work, constructing temporary diversions, temporary storm water control, construction of cofferdams, initial site work including temporary fencing and sanitary facilities, sinks, maintaining drainage, protection and support of existing facilities, coordination with the owner working in the area, potholing and locating existing utilities, construction staking, general project cleanup, and all costs for miscellaneous work shown and described in the Contract Documents, not included in other bid items. Payment for this item shall not exceed 2 percent of the bid item amount. The bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

Bid Item No. 4 – Storm Water Pollution Prevention Plan (SWPPP) and Dust Control Plan (DCP):

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to implement an Under Once Acre Storm Water Pollution Prevention Plan (UPPP) as specified, and for all necessary inspection, monitoring, testing and reporting services and as set forth in the UPPP and to perform dust control measures for the project limits in accordance with these specifications. Payment for this item shall not exceed 1 percent of the bid item amount. This bid item will be paid for by Lump Sum, prorated, based on percentage of work completed.

Bid Item No. 5 – Abandon in Place (E) 24-inch Sewer Pipeline:

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required for the abandonment of the existing 24-inch sewer main and existing manholes, and remove existing 24-inch sewer main from STA 43+99.8 (7.1’ LT) to STA 49+72.53 (41.1 RT) in conformance with the details as shown on the Plans, and as described in the Specifications, including but not limited to proper disposal of sections of existing pipe removed, plugging manholes and filling of the pipeline to be abandoned. This bid item will be paid for by Lump Sum.

Bid Item No. 6 – Furnish & Install 3,328 +/- LF 36-inch HDPE SDR 21 (Class 100 PSI) (F):

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to install 3,328 +/- LF 36-inch diameter HDPE SDR 21 (Class 100 PSI) gravity sewer pipeline from STA 10+00 to STA 42+58 and STA 50+98.26 to STA 51+80, including miscellaneous fittings, thrust blocks, trenching, backfill, compaction, remove and replace existing pavement from STA 10+00 to 10+47 and STA 50+98.26 to STA 51+80, remove and replace curb and gutter from STA 10+00 to 10+47 and other incidentals necessary for completing all work involved as detailed on the Plans and Specifications. This bid item will be paid for on a unit price basis per Lineal Foot of pipe installed.

Bid Item No. 7 – Furnish & Install 60-inch Manhole:

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to furnish and install 60" sewer manhole as shown and specified, including base, riser, cone section, frame, grate, and concrete apron for manholes located in unpaved areas, connecting pipelines and all other work necessary to result in a complete and operating manhole in accordance with the Plans and Specifications. This bid item will be paid for Per Each.

Bid Item No. 8 – Furnish & Install or Construct Sewer Junction Box:

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals involved to furnish & install or construct sewer junction box as shown on the Plans, and as described in the Specifications. In addition, the work includes furnish and install of lockable spring assisted H20 traffic rates aluminum or steel hinged doors. and grating supports, as shown on the Plans, and as described in the Specifications. Payment shall include all costs for excavation, dewatering, sub-grade preparation, forms, reinforcing steel, concrete materials, grout, steel plates, anchor bolts, backfill, and grading of the site. This bid item will be paid for on a Lump Sum basis, prorated, based on percentage of contract work completed.

Bid Item No. 9 – Construct San Luis Canal Siphon:

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to construct the San Luis Canal Siphon as shown in the Plans and as described Specifications. This item includes constructing inlet and outlet siphon structures, constructing reinforced canal concrete liner, furnish and install the rip rap and geotextile fabric, pipeline collars to structures, 8-inch air vents, chain link fence, chain link fence extension, and 20' access gate, inlet & outlet trash racks, guardrail, safety cable & float assembly, canal safety ladder, wall drain valve, relocate storm drain outlet, construct pipeline field bends, and install Owner furnished 48-inch RGRCP ASTM C361 C-25 & appurtenances as detailed on the Plans.. This item also includes sub-grade preparation including excavation, scarification, backfill, moisture conditioning, and compaction, transition channel grading and other incidentals required to construct the San Luis Canal siphon as detailed on the Plans and Specifications. This item will be paid for by Lump Sum, prorated, based on percentage of work completed for this item.

Bid Item No. 10 – Construct San Luis Canal Turnout:

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to construct the reinforced concrete San Luis Canal Turnout and Pump Sump which includes all miscellaneous metals, furnish and install rip rap & geotextile fabric in San Luis Canal, trash rack, 36" canal gate, 36-inch AWWA C200 CMLC Steel Pipe, Pump Sump cover and 6-inch air vents. This item also includes sub-grade preparation including excavation, scarification, backfill, moisture conditioning, and compaction, and other incidentals required to construct the San Luis Canal Turnout as detailed on the Plans and Specifications. This item will be paid for by Lump Sum, prorated, based on percentage of work completed for this item.

Bid Item No. 11 – Construct San Luis Canal Outlet:

Payment under this item shall be considered full compensation for all labor, materials, tools,

equipment and incidentals required to furnish and install 30-inch AWWA C200 CMLC Steel Pipe, Bends & Appurtenances from STA 200+71.20 to STA 200+97.80 of the San Luis Canal Outlet, furnish and install rip rap & geotextile fabric in San Luis Canal. This item also includes sub-grade preparation including excavation, scarification, backfill, moisture conditioning, and compaction, and other incidentals required to construct the San Luis Canal Outlet as detailed on the Plans and Specifications. This item will be paid for by Lump Sum, prorated, based on percentage of work completed for this item.

Bid Item No. 12 – Construct San Luis Drain Crossing:

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to install 36-inch diameter HDPE SDR 21 (Class 100 PSI) gravity sewer pipeline and 60" sewer manholes from STA 42+58 to STA 50+98.26 as shown in the Plans and in accordance to the Specifications. This item also includes miscellaneous fittings, thrust blocks, trenching, backfill, compaction, encasing the pipe in sand-cement slurry while crossing the Santa Fe Canal via existing 60" RGRCP sleeve, manhole base, riser, cone section, frame and grate, and all other work necessary to result in a complete and operating manhole and any other necessary incidentals for completing all work involved as detailed on the Plans and Specifications. This bid item will be paid for on a Lump Sum basis, prorated, based on percentage of contract work completed.

Bid Item No. 13 – Furnish, Install, and Operate Sewer Bypass:

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to furnish, install, operate sewer bypass pumping in the manholes directly upstream of tie-in locations, construction of San Luis Canal Siphon, construction of San Luis Drain Crossing installing a plug in the manhole gravity line to the Los Banos Wastewater Treatment Facility, and installing temporary pump discharge piping to a downstream manhole. Additional sewer bypass might be required; it is the Contractor to responsibility to determine in which instances a sewer bypass is required to complete the Project construction. This bid item shall include preparing and submitting a bypass plan and spill prevention & response plan to the Owner for review and approval prior to commencing work. The pump installed in the manhole should be equipped to pump the wastewater out of the manhole and to a downstream manhole. The bid item will be paid by Lump Sum, prorated, based on percentages of contract work completed.

Bid Item No. 14 – Furnish & Install Traffic Control and Detour Plan:

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to maintain traffic control measures for the project limits in accordance with the Plans, Specifications and County requirements. This bid item shall include preparing and submitting a Traffic Control Plan to the County and Engineer for approval prior to the preconstruction meeting. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

ALTERNATE BID ITEMS

Alternate Bid Item No. 1 – Manhole Coating

Payment under this item shall be considered full compensation for all labor, materials, tools, equipment, special inspections and incidentals required to apply a protection Manhole Coating as detailed on the Plans and Specifications. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

Bid Schedule
For
FINAL KILOMETER SEWER TRUNK LINE REPLACEMENT PROJECT

Bidder agrees to perform all the work described in the Contract Documents for the following unit and lump sum prices and understands that the quantity of work shown is approximate only. The schedule shall be completed by the bidder with the unit and lump sum prices entered in numerals. The extensions shall be made by the bidder. In case of discrepancy between the unit prices and the extension thereof, the unit price shall be considered as correct when evaluating bids.

ITEM NO.	ITEM	QUANTITY AND UNIT		UNIT PRICE	AMOUNT
1	Mobilization/Demobilization, Bonds and Insurance and Permits (5%)	1	LS	$	$
2	Worker and Public Protection (2%)	1	LS	$	$
3	Miscellaneous Facilities and Operations (2%)	1	LS	$	$
4	SWPPP and DCP (1%)	1	LS	$	$
5	Abandon in place (E) 24-inch Sewer Pipeline and (E) Manholes	1	LS	$	$
6	F&I 36-inch HDPE SDR 21 (100 PSI) (F)	3,328	LF	$	$
7	F&I 60-inch Manhole	15	EA	$	$
8	F&I or Construct Sewer Junction Box	1	LS	$	$
9	Construct San Luis Canal Siphon	1	LS	$	$
10	Construct San Luis Canal Turnout	1	LS	$	$
11	Construct San Luis Canal Outlet	1	LS	$	$
12	Construct San Luis Drain Crossing	1	LS	$	
13	Furnish, Install, and Operate Sewer Bypass	1	LS	$	$
14	F&I Traffic and Detour Plan	1	LS	$	$
ALTERNATE BID ITEMS					
1AB	***Manhole Coating***	***1***	***LS***	***$***	***$***

TOTAL: **$** _____

Note: The representations made herein are made under penalty of perjury. Any information contained in the bid which is proven false shall be considered nonresponsive and this bid shall be rejected.

SECTION 03 36 00

CONCRETE LINING FOR CORROSION PROTECTION

PART 1 GENERAL

1.1 WORK INCLUDED

A. This specification includes furnishing at the contractor's price, all permits, insurance, labor, materials, supervision, equipment, tools, and associated quality control tests necessary to perform the required cleaning, surface preparation, linings application, and clean up to designated areas identified in this specification, on drawings, or "job walks" provided at the jobsite for new linings on the interior of concrete structures as shown on the plans and as identified by the City.

1.2 QUALITY ASSURANCE

A. Any conflicts or inconsistencies found to exist in this specification should immediately be brought to the City's attention in writing. The Contractor shall provide a City approved third-party lining inspector qualified N.A.C.E. III to provide inspection services for the lining application.

B. The Supplier's latest published instructions for the proper use and application of the lining materials are a part of this specification.

C. All welding, burning, cutting, grinding, and other such repairs shall be complete prior to commencing abrasive blasting and/or application of the lining material.

D. This specification requires Contractor compliance with all environmental safety and worker safety regulations affecting the scope of this work.

E. The contractor shall demonstrate, by reference or other suitable means, the capability to provide the craftsmanship, experience, and equipment necessary to perform satisfactorily to this specification. This shall include detailed procedures describing how the following will be accomplished: Surface preparation, lighting, ventilation, material storage, heating, material mixing, and application of the lining materials to the City's satisfaction. The contractor shall be a licensed lining contractor and shall be approved by the manufacturer of the proposed lining system. The contractor shall have a minimum of five years experience applying the approved lining system and shall show by reference 5 projects of similar size and scope with contact names and phone numbers at the request of the engineer. The contractor shall possess a C-33 license. The contractor shall be licensed and certified as an approved applicator by the proposed lining material manufacturer and shall provide this certification with their bid. The contractor shall be licensed to apply the polyurethane system proposed using the gas injection method known as ECOSYSTEM® and shall provide this documentation with their bid.

F. The proposed material manufacturer shall have been in the regular business of manufacturing the approved lining system for a minimum of 15 years. They shall

show by reference a minimum of five projects that are 15 years old and in service today including contact names and phone numbers at the request of the engineer.

G. This specification requires that the environmental conditions shall be controlled from start to finish of this job to help assure quality work is completed in a timely manner or specified time as may be stated elsewhere in this specification.

H. All materials and equipment brought to the jobsite to perform work shall be promptly removed from City's property at the completion of work except the installed lining, unless otherwise specifically agreed to with the City.

I. Used grit generated during abrasive blasting may be classified as hazardous waste. Laboratory testing, classification, and determination of disposal methods are mandatory. Documentation of the above items shall be submitted and approved by City before removal from the jobsite.

J. Abrasive blasting operations, cleaning operations, and lining material applications are not permitted in the same area at the same time or before lining materials have dried.

K. All surfaces subject to damage by blasting, cleaning and lining operation, such as, exterior coated surfaces, machined surfaces, valve stems, nameplates, pump shafts, meters, sight glasses, machinery bearings, and other such items shall be protected. All protective wraps or tape shall be removed upon completion. All damaged external areas shall be repaired to the original condition.

L. All work shall be scheduled and performed in cooperation with the City to maintain effective operations within "NORMAL WORKING HOURS."

M. All workmanship shall be of journeyman quality, performed by skilled and competent craftsmen. The City reserves the right to have the Contractor remove any workman who, in the opinion of the City's representative, refuses to perform or is incapable of performing satisfactory and acceptable work, or who violates any safety rules or practices of the City, County, and/or State ordinances and laws.

1.3 REFERENCED STANDARDS

A. Referenced standards shall be the latest revision unless otherwise specified.

B. Steel Structures Painting Council, National Association of Corrosion Engineers, and American Society for Testing and Materials Standards as follows:

DESIGNATION	**DESCRIPTION**
SSPC-SP1	Solvent Cleaning
SSPC-SP2	Hand Cleaning
SSPC-SP3	Power Tool Cleaning
SSPC-SP5	White Metal Blast Cleaning
SSPC-SP6	Commercial Blast Cleaning
SSPC-SP10	Near White Blast Cleaning
SSPC-SP 12	Low Pressure Water Jet
SSPC-SP13	(1999) Surface Preparation of Concrete NACE No. 6
SSPC-VIS1	Pictorial Surface Preparation Standards

NACE-Std.-RPO178-78	Design, Fabrication & Surface Finish Metal Tanks & Vessels Lined for Chemical Immersion Service
NACE-Std.-RPO188-88	Discontinuity (Holiday) Testing of Protective Coatings
NACE-Std.-RPO288-88	Inspection of Linings on Steel and Concrete
ASTM D 4263-83	Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
ANSI/ASTM D4541	Test Method for Pull-Off Strength of Coatings Using Portable Adhesion-Testers

C. Technical Definitions:

1. 100 Percent Solids: Coatings containing zero volume solvent: zero VOC

2. VOC: Volatile Organic Compound

3. Plural Component: An application unit that will pump, heat, proportion, mix, and deliver the two (or more) component materials utilizing airless or conventional spray guns, or pour nozzles. The individual components are supplied to the heaters and proportioning pump through separate feed pumps, with the materials being pressurized and metered by the proportioning pump and then transferred to the mixer/manifold through individually heat-traced material lines. At the mixer/manifold, materials meet and are intimately blended before deposition onto the substrate by airless or conventional spray, or pour nozzles, as a non-stressed, seamless monolithic lining system.

4. Single Coat: A deposition of the material to the required thickness through multiple passes comprising of a single application in which no period greater than one hour is required to allow the material to "set" before continuing to build to specified thickness.

5. Recoat Window: The period of time that has passed when it is acceptable to apply succeeding coats without additional surface preparation.

6. Durometer: An inspection tool used to determine the hardness (indicative of level of cure) in an applied polyurethane film.

PART 2 PRODUCTS

2.1 LINING SYSTEM:

A. The applied lining material shall be a two-component (2:1 mix by volume) chemically reactive product specially formulated 100 percent solids, aromatic, MDI, pure elastomeric polyurethane lining system, ASTM type V, and shall be applied using a heated "plural component" proportioning equipment system designed for high pressure airless spray (maximum 2500 psi) for a minimum distance from the proportioner to meet job conditions. 1:1, 3:1 or any proportion other than 2:1 ratio polyurethane formulations shall not be considered as equal to the 2:1 ratio material. The lining material shall contain no extenders or fillers, shall not be a hybrid and shall exhibit the following physical properties and test values.

Tensile strength per ASTM D638..... 2800-3000 psi

Elongation per ASTM D638 ..... 40%-65%
Abrasion resistance per ASTM D4060..... < 54 mg loss
Impact resistance per ASTM G-14.....210 inch pounds
Water Vapor permeability per ASTM D1653-91A.....048grms/24 hours/ft2
Atlas Cell test NACE TM-04-74 Test Procedure A ..... 12 months No Effect

B. Maximum recoat window of 24 hours.

C. The liner material shall be Endura Flex EF1988®. No substitutes allowed.

D. The Contractor shall name the Supplier and provide written certification from the manufacturer of the proposed materials, compliance with current Contractor approvals and licenses to apply the material at the time of bid submittal.

E. All materials shall be received at the jobsite in their original unopened containers with labels intact. Batch numbers for all components of the lining system shall be recorded and copies made available for the City.

F. All materials shall be stored where they are protected from the weather and dampness. Storage temperatures shall be those recommended by the manufacturer.

2.2 EQUIPMENT REQUIREMENTS

A. Contractor shall utilize Plural Component proportioning equipment capable of pumping two separate streams of polyurethane components at the required ratio volumetrically.

B. Contractor shall have capability to heat the two different liquid components to a process temperature range from 100^0 to 110^o Fahrenheit (38^0 to 42^o C). The use of band heaters is NOT acceptable.

C. Contractor shall have capability to maintain process temperature to spray through a gun or pour through the nozzle. The use of insulated heat-trace fluid lines is mandatory.

D. Contractor shall have capability to pump at pressures ranging from 1200 PSI to 3000 PSI.

E. Contractor shall have capability to bring the two separately proportioned streams together as one stream and mix them together to provide a homogeneous mixture for reacting into a solid polymer of known properties.

F. Contractor shall provide spray atomization tip sizes matched to the pumping equipment output which provides a fully atomized spray pattern, free of "fingers" without the addition of solvents of any kind.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

A. Concrete General: Voids, bug holes, tie holes, or cracks in the concrete should be filled/sealed using the following methods:

1. Cracks that exceed 1/16” shall be filled with industry recognized epoxy injection procedures.

2. Surface voids shall be filled per approved lining manufacturer’s recommendations.

3. Form fins and sharp offsets, protrusions, or similar irregularities projecting from the concrete surface shall be removed by chipping, bush hammering, needle gunning, wire brushing, or other mechanical means.

4. Water seepage into or through the concrete shall be stopped and concrete thoroughly dried by suitable means before the system is applied.

B. Expansion Joints and Terminations:

1. Expansion Joints: Expansion joints shall be sealed with a bond breaker tape (polyethylene-backed adhesive tape such as used for wrapping pipe joints is acceptable). Before installation of the bond breaker tape, remove sharp protrusions, verify the surface is clean and dry, and inspect to assure that joint filling material is reasonably flush with top of expansion joint. The tape shall be installed centered over the joint and be of sufficient width to extend a minimum of one inch onto the concrete on both sides of the joint. Tape thickness should be no more than 60 mils maximum. The bond breaker tape shall be top coated with EF-1988 to the minimum specified thickness plus an extra 20 mils for added strength since there is no bond to the substrate in these areas.

2. Leading Edges/Terminations: All surfaces specified for lining application that do not include a well defined beginning or ending shall be mechanically anchored to a dry, clean saw cut to a minimum depth of 1/4 inch and width of 1/8 inch. The EF-1988 solid base coat shall be applied into the saw cut to full depth. After installation of the leading edge, the area shall be top coated with EF-1988 material. Adjacent areas not scheduled for lining shall be taped off and protected from overspray.

C. Abrasive Blast Cleaning:

1. Concrete Surface Cleanliness: Sprinkle water on the dried suspect concrete surface. If the water spreads out immediately instead of standing as droplets, it may be concluded that the surface is not contaminated by oils or dust. If droplets are found, use the procedure stated in Paragraph 3.1 C.2 or C.3, as appropriate.

2. Chemical Cleaning: The site shall be maintained free of debris, water, oil, grease, silicones, wax, pitch, and other types of oily substances. Surfaces showing evidence of such contaminants shall be cleaned using solutions of caustic soda or trisodium phosphate. They should be applied with vigorous scrubbing, followed by flushing with fresh water to remove all traces of both the detergent and contaminant and shall then be thoroughly dried.

3. Abrasive Blast Cleaning: Oil and grease that have soaked into the surface should be removed prior to blast cleaning. Abrasive blast cleaning shall be utilized in accordance with SSPC SP13 to obtain a surface in which a textured finish is achieved. If the surface of the concrete is weak, more material should be removed. Sufficient material shall be removed to result in a strong, sound substrate. The compressed air used for blasting or blow downs shall be clean and free of oil particles. This means that the air compressor shall be equipped with efficiently-operating oil and water traps. Refer to NACE procedure for "Blotter Testing" of compressed air.

4. Surface Cleanliness, Dusty Condition: Wipe the surface with a dark, clean cloth. If a white powder is on the cloth, the surface is considered to be too dusty and therefore unsatisfactory for lining. Blow down the areas with clean, dry air.

5. Surface Cleanliness, pH Condition: Use either pH paper or a pH Meter to determine the pH at the concrete surface. A pH range of seven-to-nine is considered acceptable.

D. Existing Bare Concrete; Dry, Deteriorated, with Exposed Aggregate:

1. Surfaces to be coated shall be abrasive blasted, hydro-blasted, or a combination of both in order to remove all loose, soft, and contaminated concrete back to sound and structurally stable material, as stated in Paragraph 1.04.C.

2. All surfaces to be coated shall be completely dry, clean, and contaminant-free before application. Surface dryness shall be verified according to ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.

E. Steel Surfaces:

1. All existing bare steel surfaces shall be abrasive blasted to a cleanliness level of SSPC-SP 10.

2. All existing bare steel surfaces shall exhibit an anchor profile of 3.5-4 mils as measured by testex tape.

3.2 APPLICATION

A. Before start of application and at such times when long breaks are involved or application equipment malfunctions, the following four material quality tests shall be performed for the Inspector.

1. A ratio check to verify required volumetric proportioning.

2. A mixed material check to verify proper mixing of components.

3. Curing cycle test to verify the proper reaction is under way. At least a pint sample is to be utilized. First Durometer results should be determined in 15 minutes.

4. A weight check (10 oz. container with solid material and a 10 oz. container with expanded material) to verify proper expansion rate.

B. All surfaces receiving the lining shall be visually dry and at least 50º Fahrenheit (3º C.) above the Dew Point prior to starting the installation to prevent moisture entrapment. The Relative Humidity shall not exceed 85%. Successive topcoats, if necessary, shall be applied within 24 hours so as to not exceed the recoat window.

C. The compressed air shall be clean and free of oil and water. Refer to NACE Blotter Test procedure.

D. Base component shall be mixed thoroughly with a power mixer. Base and Activator shall be heated to 100-110º Fahrenheit (38-43º C.) prior to use.

E. **Thinning of Material is Prohibited.**

F. The applied repair lining shall be a uniform system applied to a minimum thickness of 250 mils TDFT, of which 200 mils is expanded and 50 mils is solid, utilizing ECOSYSTEM® technology for the gas injection of polyurethane films.

G. The lining shall be installed as a liquid seamless system by spray or pour directly to the substrate, allowing the material to conform to the profile of the substrate, creating a non-stressed, seamless monolithic film.

H. Wet film thickness shall be monitored throughout the installation by means of frequent measurements with a high-range wet film thickness gage.

I. If the project is not completed, then at the end of the work day a three-to-twelve inch "returning edge" of material will be left tapered to the substrate for the start of the next workday. The "returning edge" shall be cleaned free of any visible contaminates before proceeding to spray on start up the following workday.

J. The spray application shall be according to the principles of good workmanship outlined in SSPC-PA1-82, and shall provide a finish which is continuous, uniform in thickness, and verified free of pores or other defects using electrical discontinuity testing (high voltage spark testing).

3.3 INSPECTION AND QUALITY CONTROL

A. The Contractor shall enlist the aid of various field tests and implement those tests to verify the integrity of the applied lining to his satisfaction. The City shall be permitted full access at all times to observe and be satisfied that the specification is being followed.

B. The City shall be given sufficient notice so as to be present, if desired, when the following hold points are reached:

1. Completion of surface preparation.

2. Prior to lining application.

3. During wet and dry film thickness measurements.

4. During pinhole detection testing.

5. During lining repairs.

C. The following quality control tests shall be performed by the Contractor with results recorded and made available to the City:

1. Compressed air quality per blotter test.

2. Environmental conditions prior to lining application, including substrate temperature, ambient temperature, relative humidity and dew point.

3. Observation of surface preparation, including anchor pattern, prior to lining application.

4. Results of ratio check of plural component proportioning equipment.

5. Wet and dry film thickness measurements.

D. The multi-component lining material shall be verified as to proper proportioning of materials at the start of each day and at any time of equipment malfunction before resuming operations. Any necessary site clean-up due to installing improperly reacted materials shall also be made at that time.

E. The following inspection equipment (or City approved equal) shall be utilized by the contractor for performing quality control testing:

1. Sling psychrometer

2. Surface temperature thermometer

3. Ambient temperature thermometer

4. Psychrometric charts for determining relative humidity and dew point

5. High range wet and dry film thickness gages

6. Micrometer

7. Durometer; A and D Scale

8. Sample cans

9. Inspection glass (30 power minimum)

10. High voltage pinhole detector

F. The lining shall be 100% visually inspected for holes, voids, and thin areas.

G. High-voltage discontinuity testing to be performed by Contractor to assure a "pinhole-free" lining system shall be in accordance with NACE Standard RPO188-86, "Discontinuity (Holiday) Testing of Protective Coatings."

H. The contractor shall verify that the applied lining materials has reached cure, as evidenced by hardness, prior to placing into service.

I. When verification of adhesion is required, testing shall be done in accordance with ANSI/ASTM D4541.

3.4 REPAIRS

A. Any damaged areas, faulty areas, or discontinuities (pinholes) found during quality control inspection within a 24-hour (within the recoat window) period of application, and which can be completely repaired within the recoat window, shall be corrected as follows. If repairs will extend beyond the recoat window, use the procedures in Section 3.4.B below.

1. Damaged or Faulty Areas (i.e., impact damage, off-ratio application, etc.): Solvent clean area thoroughly, extending at least six inches beyond damaged area with MEK, Xylene, or Naptha (as allowed) dampened cloth (do not apply excessive solvent to repair area, the intent is to clean only), allow solvent to thoroughly dry. When thoroughly dry to touch, spray area with the lining material to the specified thickness, feathering the material into the existing lining. Note - In the event that the damaged area exhibits a rusty or discolored substrate substandard to the specified requirements, these areas shall receive the same degree of surface preparation required by the original project specifications prior to application of the lining material.

2. Discontinuity (Pinhole) Repair: Solvent clean the immediate area around the detected discontinuity with MEK, Xylene, or Naptha (as allowed) dampened cloth (do not apply excessive solvent to pinhole area, the intent is to clean only), allow solvent to thoroughly dry. Hand apply (putty knife, etc.) a small amount of mixed material directly to the pinhole. For pinhole repairs, hand mix and thoroughly blend a small amount (normally two or three ounces at a time, for each applicator) of Part A and Part B in correct ratios.

B. Any damaged areas, faulty areas, or discontinuities (pinholes) found during quality control inspection AFTER 24 hours of lining installation (exceeding recoat window) shall be corrected as follows:

1. Abrade the surface using abrasive blast or power tools, as practical, down to and including exposed bare steel to remove surface shine, to roughen the surface, and to prepare the substrate to the original standard. Abraded area shall extend at least six inches (15 cm.) beyond damaged or faulty area. After

abrading the surface, vacuum or blow down with clean, dry compressed air thoroughly to remove all loose particles. Solvent clean the area thoroughly, extending at least six inches (15 cm.) beyond the damaged area with MEK, Xylene, or Naptha (as allowed) dampened cloth (do not apply excessive solvent to pinhole area, the intent is to clean only), allow solvent to thoroughly dry. When thoroughly dry to touch, spray area with the lining material to the specified thickness, feathering the material into the existing prepared lining.

2. Discontinuity (Pinhole) Repair shall be completed following the guidelines listed in Section 3.4.A.2 above.

END SECTION

SECTION 31 05 00

COMMON WORK RESULTS FOR EARTHWORK

PART 1 GENERAL

1.1 WORK INCLUDED

A. Excavate earth and rock as necessary to allow the installation or construction of various items of work regardless of character and subsurface conditions.

B. Haul, place, rough grade, compact, and finish grade imported and/or excavated on-site material (including recycled materials) on those portions of the project site where it is necessary to construct the facilities other than utilities indicated on the Plans. This includes under structures and preparation of subgrade for concrete, roadway, parking area, and embankments.

C. Haul and dispose of excess and unsuitable material off-site or in designated areas, as directed by the Engineer.

1.2 RELATED WORK

A. GENERAL & SPECIAL PROVISIONS

B. Section 02 41 00 – Demolition

C. Section 03 30 00 – Cast-In-Place Concrete

D. Section 31 11 00 – Clearing and Grubbing

E. Section 31 23 17 – Trenching, Backfilling, and Compacting

F. Section 31 23 21 – Dewatering

G. Section 31 23 35 – Disposal of Materials

H. Section 32 11 23 – Aggregate Base

1.3 REFERENCES

A. Geotechnical Engineering Investigation entitled, PROPOSED NEW RECHARGE BASIN AND SEWER IMPROVEMENT by BSK ASSOCIATES, dated JANUARY 15TH, 2024 and PROPOSED RECHARGE BASIN AND SEWER IMPROVEMENTS – NEW SIPHON BY BSK ASSOCIATES, dated FEBRUARY 27TH, 2025.

B. ASTM International (ASTM)

1. C136 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

2. D75 – Standard Practice for Sampling Aggregates

3. D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort 56,000 ft-lbf/ft^3 (2,700kN-m/m^3)

4. D6938 – Density of soil and base rock in place by Nuclear method.

5. D2937 – Density of soil and in place by Tube method.

C. California Department of Transportation
1. State Standard Specifications

a. Section 10-6 Watering

b. Section 15 Existing Facilities

c. Section 17-2 Clearing and Grubbing

d. Section 18 Dust Palliatives

e. Section 19 Earthwork

f. Section 26 Aggregate Bases

D. Code of Federal Regulations

1. 29CFR1926, Subpart P – Excavations

1.4 SUBMITTALS

A. Submit plans as required for worker protection against caving ground in excavations.

B. Submittals shall be in accordance with the General and Special Provisions.

1.5 SAMPLES

A. Samples shall be submitted in accordance with the General and Special Provisions.

1.6 PROTECTION

A. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation.

1. Trenches shall have sloping, sheeting, shoring, and bracing conforming with Subpart P, CAL/OSHA requirements, and the Contract Documents.

B. Notify Engineer of unexpected subsurface conditions.

C. Protect bottom of excavation from frost.

D. Underground utilities may exist at this site. Contractor shall take all necessary precautions to protect said utilities. Notify Engineer of any deviation in utility location from that which is shown on the drawings.

E. Grade excavation top perimeter to prevent surface water run-off into excavation.

1.7 CONTROL AND DIVERSION OF WATER

A. The Contractor shall control and divert water as specified in Section 31 23 19.

B. General – The Contractor shall furnish or procure all materials and labor required for constructing and maintaining all necessary cofferdams, channels, flumes, drains, sumps, and/or other temporary diversion and protective works and shall furnish, install, maintain, and operate all necessary pumping and other equipment for removal of water from the various parts of the work and for maintaining the foundations, trenches and other parts of the work free from water. The Contractor shall at all times have on the project sufficient pumping equipment for immediate use, including stand-by pumps for use in case other pumps become inoperable.

C. Plan – Prior to beginning any work; the Contractor shall submit for the Engineer's approval a water control plan showing the proposed method for the removal of water from foundations, trenches and other parts of the work.

D. Dispose of the water in a manner that will prevent damage to the adjacent property and in accordance with regulatory requirements.

E. Devices to control and divert water shall be adequately filtered to prevent the removal of fines from the soil.

F. Provide separate pipelines to drain trench water during construction.

G. Repair any damage caused by the failure of any part of equipment to control and divert water. Remove temporary equipment to control and divert water when no longer needed for dewatering purposes.

H. Provision of equipment to control and divert water shall be considered part of the project with no additional compensation allowed.

I. Drain rock will not be allowed in trenches.

1.8 QUALITY ASSURANCE

A. Compaction Testing:

1. All compaction testing shall be in accordance with the General and Special Provisions and performed in accordance with Section 19-5 of the State Standard Specifications.

2. Compaction tests will be performed for each lift or layer.

3. Tests for compaction shall conform to ASTM D1557 and D6938.

4. Sample aggregates to be used for backfill materials per ASTM D75 and test them per ASTM C136.

1.9 DEFINITION

A. Unsuitable Material – Unsuitable material is material determined to be:

1. Impossible and/or incapable to compact to specified density using ordinary methods at optimum moisture content.

2. Material containing trash, debris, oversized material or other foreign and objectionable materials.

3. Too wet to be properly compacted if circumstances prevent satisfactory in-place drying prior to incorporation into the work.

4. Non-native material containing a significant amount of permeable materials, such as sand or rock, that cannot be blended with other material and requires to be off hauled.

5. Expansive clays that cannot be mixed or treated and requires to be off hauled.

6. Otherwise unsuitable for the planned use.

1.10 PROJECT CONDITIONS

A. The existing canal embankments contain both non-plastic silty material and expansive clay material; see the Geotechnical Report for more information.

B. Arrange construction sequences to provide the shortest practical time that excavations will be open to avoid hazard to the public, and to minimize the possibility of excavation collapse.

1.11 CLASSIFICATION

A. Expected material that will be excavated at this site has been identified in the Geotechnical Report.

PART 2 PRODUCTS

2.1 SOIL

A. Native Soil: Original surface soil typical of the area.

B. Topsoil: Capable of supporting native and specified plant growth.

C. Backfill: All backfill material shall be approved before use and be free of cinders, ashes, ice, frozen soil, large hard clods, organic debris, or other deleterious items.

D. Engineered Fill: Fill materials for all fill areas shall be as required by Geotechnical Report and/or State Standard Specifications, Section 19-3 ”Structure Excavation and Backfill”.

E. Embankment Fill: Fill materials for use in construction of roadway embankments should be non-expansive, free of organic matter and granular in nature, within the following limits:

Sieve Size	Percent Passing
3 in.	100
No. 4	80-100
No. 200	30-80
R-Value	50 (min.)
Plasticity Index	<10
Expansion Index	<10

All materials for roadway embankments shall be non- to low-corrosive in nature.

2.2 GRANULAR BACKFILL AND AGGREGATES

A. **Granular Backfill**: material meeting the requirements of State Standard Specifications Section **19-3.02C Structure Backfill.**

B. Class 2 Aggregate Base: material as specified for ¾" maximum grading in the State Standard Specifications, Section 26-1.02B.

C. Material from concrete crushing operations may be used as granular backfill provided it meets the above requirements.

D. Gravel: Pit run, natural stone; free of shale, clay, friable materials and debris; graded in accordance with 1½" x ¾" aggregate grading in Section **90-1.02C "Aggregates",** State Standard Specifications.

E. Sand: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter, graded in accordance with State Standard Specifications Section 90-1.02C(4)(c):

2.3 CONCRETE SLURRY

A. Concrete slurry mix shall be as specified in Section 03 30 00, Cast in Place Concrete.

2.4 ENGINEERED FILL MATERIAL UNDER STRUCTURES

A. Common Fill Material (native material) is not acceptable for use as Engineered fill under any structure, tank, tank ring wall, or concrete slab.

B. All subgrades for concrete structures or slabs shall incorporate 6" of aggregate base at the surface directly below the structure or slab.

C. Pulverized asphalt concrete may not be incorporated into engineered fill under structures

D. Portland cement concrete may be incorporated into engineered fill provided no rock pockets or voids are produced. Particles larger than three inches shall be removed from engineered fill.

E. All imported fill material placed in structural areas shall consist of predominantly granular soil that is non-expansive and shall be approved by the Engineer prior to use.

F. The R-value of the imported fill material shall be at least 50.

2.5 WATER

A. As specified in the General and Special Provisions.

2.6 ROLLERS

A. Rollers used for compacting earth materials shall have staggered and uniformly spaced tamping feet and be of sufficient weight for proper compaction.

B. The tamping heads and cleaner bars shall be properly maintained, and the spaces between the tamping feet shall be kept clear of materials which impair the effectiveness of the tamping rollers.

2.7 TAMPERS

A. Where hand or power tampers are used to compact soils in confined areas such as under pipe, they shall be equipped with suitably shaped heads to obtain the required density.

2.8 MATERIALS/ON-SITE MATERIAL FOR EMBANKMENT/ROADWAY CONSTRUCTION

A. Material for embankment/roadway construction shall be able to be compacted to specified density using ordinary methods at optimum moisture. The presence of excessive moisture in otherwise suitable material is not, by itself, sufficient cause for determining that the material is unsuitable. The Contractor shall be responsible for aeration of excavation or embankment to satisfactory moisture content for compaction.

B. All embankment/roadway engineered fill material will be subject to approval by the Engineer.

2.9 CANAL EMBANKMENTS

A. Canal embankment fill shall use the materials in compliance with the following requirements:

1. Contain a minimum fines content of 20%;

2. Contain no rocks larger than 3-inches;

3. Plasticity Index less of less than 12.

4. Material used outside of the inner 8-foot section of the embankment has the same requirements as the inner 8-foot section with the following exception: rocks up to 6-inches are allowed granted they are sufficiently mixed with smaller grained material and the larger rocks are not nested together.

5. If expansive clays (PI greater than 25) are present, the material shall be mixed with lower plasticity material and/or treated with lime. If non-plastic material (PI less than 10) is present, the material shall be blended with higher plasticity material. The determination of the presence of high plasticity or low plasticity material that will require treating and/or blending will be at the desertion of the Owner's Representative.

PART 3 EXECUTION

3.1 GROUND SURFACE PREPARATION

A. Complete demolition, clearing and grubbing as specified in Sections 02 41 00 and 31 11 00 including removal of any curbs, slabs, paving, trees, bushes, shrubs, stumps, roots, buried objects, or any objects that interfere with construction, or as required by the Engineer.

B. For roadway or embankment work, complete all logging and topsoil stripping. Scarify and re-compact the stripped ground.

3.2 INSPECTION

A. Verify stockpiled fill to be reused is approved. Provide samples for testing, if required.

3.3 GENERAL

A. Identify required lines, levels, contours, and datum.

1. Stake and identify the extent of all earthwork operations prior to starting work.

B. Provide required shoring, sheeting, and slope layback necessary to protect the excavation, as needed, for the safety of the employees and as required by applicable State and Federal laws. Provide suitable barricades for public safety, regardless of excavation depth.

C. Use suitable material removed from excavation before importing fill.

D. Upon completion of excavation and before placing forms or structures, notify the Engineer who will inspect the excavation and may take tests to determine relative compaction.

E. Verify areas to be backfilled are free of debris, snow, ice, or water, and surfaces are not frozen.

F. Unless noted otherwise in the geotechnical report or the contract documents the Contractor shall comply with the following minimum compactions:

1. Areas under flatwork, pavement, and structures shall be compacted to minimum of 90% relative compaction. The uppermost 12 inches under pavement shall be compacted to a minimum of 95% relative compaction.

2. Areas under embankments, scarification depth shall be a minimum of eight (8) inches recompacted to a minimum of 90% relative compaction.

3. All other fill and disturbed surfaces shall be compacted to a minimum of 90% relative compaction.

3.4 MOISTURE CONTROL

A. Water development, hauling, and application shall be in accordance with General and Special Provision.

3.5 EXCAVATION

A. Excavate the specified areas to lines and grades as shown on the Plans or as directed by the Engineer.

B. Stockpile as directed excavated material to be used in embankment/roadway construction.

C. Carefully excavate to the established lines and grades shown on the drawings, or as revised and approved by the engineer, to provide a firm, uniform, and unyielding foundation for the proposed structures.

D. If the Plans require placement of fill prior to pipe or structure excavation, the fill shall first be constructed to the design grade shown for a distance each side of the pipe or structure of not less than five times the diameter of the pipe or the width of the structure, after which the trench shall be excavated, and the pipe or structure installed.

E. Paved Areas: Sawcut existing pavement to full depth to a clean, straight line before excavation and maintain the edge suitable for repaving.

F. Excavate for all foundations, slabs, curbs, walks and/or similar work.

G. Excavations for all footings, finished walls and grade beams shall be sufficiently large so that forms for concrete may be properly placed, removed, and inspected.

1. Excavation for footings may be made to the net footing size plus two inches if the side walls of the excavation are sufficiently stable to remain in position until the concrete is in place and if approved by the Engineer.

H. Where over excavation is not required, the exposed surface under flatwork, pavement and structures shall be scarified to a depth of eight (8) inches, conditioned to optimum moisture content and compacted to a minimum of 90 percent relative compaction.

I. If any existing foundations, roots, stumps, debris, waste materials, pipes, or similar items have been removed, the Contractor shall excavate below these portions to

solid undisturbed earth and foundations in these areas shall be built to necessary levels.

J. If soil conditions in excavations are not in accordance with the geotechnical report and seem to indicate that footings need not be carried down as deep as shown, or must be carried deeper, the changes shall be made by the Contractor after approval by the Engineer.

K. Over excavation shall be required a minimum of two (2) feet below top of subgrade under proposed pavement and structures, including but not limited to all concrete slabs, etc., unless shown otherwise on the Plans.

L. Canal Excavation

1. Care shall be taken to prevent over breakage or loosening of material on bottoms or side slopes upon or against which lining is to be placed. Where the original ground surface is below the grade of the canal, the bottom of the canal shall be over filled, compacted, and subsequently trimmed to the underside of the lining as prescribed for constructing and compacting the canal embankments.

2. Except as provided below, the canal shall be excavated to a subgrade and section as shown on the drawings to provide for the prescribed thickness of lining or Rip Rap.

3. If hardpan is penetrated during the excavation of the canal prism, the entire cross-section shall be lime treated to a depth of at least 2 feet, perpendicular to the finished surface.

4. Where unsuitable material is encountered in the foundation, the material will be quantified by both the Owner’s Representative and the Contractor, then the Contractor shall perform additional excavation to remove the unsuitable material and the unsuitable excavated material shall be wasted in accordance with Section 31 23 35 (Disposal of Materials).

5. This additional excavation shall be refilled with suitable material to the underside of the lining as prescribed for constructing and compacting canal embankments. "Unsuitable Material" shall not be construed to be material in which moisture content is outside parameters established by these Specifications for acceptable foundation.

6. The Contractor shall be entitled to no additional allowance above the unit prices in the bid schedule on account of the requirement for allowing additional time for drying; for stockpiling and re-handling excavated materials which have been deposited temporarily in stockpiles; delays or increased costs due to stockpiling; poor trafficability on the excavated areas, the haul roads, or the embankment; reduced efficiency of the equipment the Contractor elects to use; or on account of any other operations or difficulties caused by overly wet materials. No additional allowance above the unit prices bid in the schedule will be made because of variation in the proportions

of wet and dry materials which are required to be excavated in order to obtain adequate suitable material.

7. Refill at top of Concrete Lining

   a. The Contractor will be permitted to over excavate at the top of the canal lining, as shown on drawings if needed, to accommodate lining equipment. Refill shall be placed as shown on the drawings. The material used for the refill may be obtained from required excavation. The type of material used, and the manner of depositing shall be subject to approval. Refill shall be placed, moistened, and compacted according to these specification for canal embankment fill. The refill shall be finished uniformly and neatly to the lines shown on the drawings.

   b. All excess refill material which remains on the concrete lining or in the invert shall be completely removed including hand broom clean up.

8. The Contractor and Owner's Representative shall inspect all excavated canal embankments for presence of non-native or sandy soils.

   a. Repairs to the existing canal banks were typically done with non-native material with a significant percentage of course aggregate.

   b. Non-native material and sandy material found within the canal embankments shall be removed to a depth of 12 inches below the non-native or sandy soil layer, or 2 feet below the canal invert, whichever is less, and replaced with suitable material.

   c. Non-native material and sandy material found within the canal embankments could be blended to be considered suitable or could be considered unsuitable by the Owner's Representative. The use of the non-native material, or sandy material, or both within the earthwork shall be at the discretion of the Owner's Representative.

   d. The Owner's Representative will work closely with the Contractor in the field to quantify for payment purposes the in-place volume of the unsuitable material that is required to be excavated and off-hauled.

*3.6 **BACKFILL FOR MANHOLES***

A. **Refer to Section 31 23 17 – Trenching Backfilling and Compacting**

3.7 ENGINEERED FILL AND EMBANKMENT CONSTRUCTION

A. Cut out soft areas of subgrade beneath roadways not readily capable of in-situ compaction. Backfill with Type A or Type B material per State Standard Specifications Section 19-3.02C and compact to density equal to requirements for subsequent backfill material.

B. Unless otherwise noted, placement and compaction of engineered fill materials for all fill areas shall be performed according to the provisions of the State Standard

Specifications, Section 19-6. Section 19-6.02A shall be amended to say that large rocky material or hard lumps larger than three inches in greatest dimension will not be allowed.

C. Before placing embankment, scarify ground surface to a depth of eight (8) inches below the original ground surface to provide ample bond between old and new material, as shown on the Plans. Place embankment material in layers not exceeding eight inches, loose measurement.

D. When necessary, compact subgrade surfaces to density requirements for roadway/embankment backfill material.

E. Where compacting of earth materials is required, the materials shall be deposited in horizontal layers not more than twelve (12) inches thick. Compact each layer before placing the next layer. As the compaction of each layer progresses, continually level and manipulate to ensure uniform moisture and density. Add water to obtain optimum moisture content. Removal of excess water shall be accomplished through aeration by plowing, blading, disking, or other methods satisfactory to the Engineer. The excavation, placing, moistening, and compacting operations shall be such that the material will be uniformly compacted and will be homogeneous, free from lenses, pockets, streaks, voids, and laminations or other imperfections such that the materials when compacted will be blended sufficiently to secure the at least the required density.

F. Moisture Content for Clayey and Silty (Cohesive) Materials:

1. Prior to and during compaction operations, the materials shall have an above optimum moisture content, but not greater than three percentage points of optimum moisture content, and the moisture content shall be uniform throughout each layer. The optimum moisture content is defined as that moisture content which will result in the laboratory maximum dry density of the soil as determined using ASTM D1557.

2. If the moisture content is less than optimum for compaction, or is greater than optimum for compaction by more than three percentage points, the compaction operations shall not proceed, except with the specific approval of the Engineer, until the material has been wetted or allowed to dry out, as may be required, to obtain a moisture content within the tolerances permitted above, and no adjustment in price will be made on account of any operations of the Contractor in wetting or drying the materials or on account of any delays occasioned thereby.

G. Moisture Content for Cohesionless Free-draining Materials: Prior to and during compaction operations, the materials shall have a moisture content at least equal to the optimum moisture content and shall be uniform throughout each layer. The optimum moisture content is defined as that moisture content which will result in the laboratory maximum dry density of the soil as determined using ASTM D1557.

H. When the material has been conditioned as specified, it shall be compacted by rollers, by hand or power tampers.

J. Fill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.

K. Employ a placement method that will not disturb or damage underground facilities.

3.8 UTILITY INSTALLATION

A. Install utility marking as specified in section 33 05 26 - Utility Line Marking.

B. Utility Installation shall be according the Division 33 Utilities. If not otherwise specified shape the trench bottom to ensure uniform contact with the full length of the installed line and remove any sharp-edged materials that might damage the line. Compaction shall be maintained beneath the line.

3.9 SAND CEMENT SLURRY, CONCRETE ENCASEMENT AND THRUST BLOCKS

A. Concrete

1. Place as shown on the Plans and in accordance with Sections 03 30 00 - Cast-In-Place Concrete.

B. Slurry Cement

1. Slurry Cement is also referred to as Controlled Low Strength Material (CLSM).

2. Place as shown on the plans and in accordance with State Standard Specifications, Section 19-3.03F “Slurry Cement Backfill”.

3.10 CONTROL OF WATER

A. The Contractor shall control and divert water as specified in Section 31 23 19.

B. The contactor shall keep all excavation free from water. Furnish, install, maintain, and operate all necessary pumping and other equipment for dewatering of excavations. The contractor shall at all times have on the project sufficient pumping equipment for immediate use, including stand by pumps for use in case other pumps become inoperable.

C. The dewatering operation shall be continuous, so that the excavated areas are kept free from water during the construction, until backfill has been placed to a sufficient height to anchor the work against possible floatation.

D. Dewatering devices shall be adequately filtered to prevent the removal of fines from the soil.

E. Repair any damage caused by the failure of any part of the protective works. Remove temporary protective works when they are no longer needed for dewatering purposes.

F. Any drain rock required in the trench bottom to convey water or stabilize wet soil shall be included at no extra cost to the owner.

G. Provision of dewatering and dewatering equipment shall be considered part of the project with no additional compensation allowed.

3.11 SURPLUS MATERIAL

A. Unless otherwise specified, surplus suitable excavated material shall be used to widen embankments uniformly or to flatten slopes, or it shall be disposed of in a uniform manner in designated surplus material areas.

B. Unless otherwise specified, surplus suitable excavated material shall be used as fill for other areas requiring fill as shown on the Plans. Excess material that is not needed for engineered fill may be disposed of at an off-site spoil area. The location of the off-site spoil area, the limits of the fill area, the depths of fill, and the manner of work shall be as directed by the Engineer.

C. Stockpile all suitable surplus material as shown on the plans and/or as directed by the Engineer. Leave topsoil stockpiles in a level graded surface. All remaining native material stockpiles with unsuitable soils shall be disposed of offsite.

D. Surplus native and other backfill materials may remain on site in a manner and location approved by the Owner.

E. All surplus material shall be exported from the site.

3.12 OFF-SITE BORROW AREAS

A. Engineered fill material may be obtained from off-site borrow areas if on-site sources prove to be insufficient.

3.13 SHORING AND SHEETING

A. Construct and maintain all shoring, sheeting, and slope layback necessary to protect the excavation, as needed, for the safety of the employees and as required by applicable State and Federal laws. Provide suitable barricades for public safety, regardless of excavation depth.

3.14 UNSUITABLE MATERIAL

A. Unsuitable material shall be excavated and disposed of in a lawful manner off the project site in accordance with Section 31 23 35 - Disposal of Materials. All disposal shall be approved by the Engineer prior to initiating the work.

B. Unsuitable material shall be excavated and deposited in the location designated by Engineer or Owner.

3.15 IN-PLACE DENSITY TESTING:

A. Compacted backfill for structures and structure foundations: At least one test per lift per 1,000 sf of surface area or per 500 cubic yards placed, whichever is more frequent.

B. Subgrade preparation including scarification and re-compaction of native soils: At least 1 test per lift per 1,000 sf of surface area or 500 cubic yards of fill placed, whichever is more frequent.

C. Embankments and building pads: At least 1 test per lift per 1,000 sf of surface area or every 200 lineal foot of embankment, or 2,000 cubic yards of fill placed, whichever is more frequent.

D. A greater frequency of testing may be required at the start of work or when new materials, crews, or equipment are introduced to the site. A lesser frequency can be utilized if approved by the Owner's Representative.

E. LABORATORY INDEX TESTING:

1. Compacted backfill for structures, structure foundations: Maximum dry density and optimum moisture content, Plasticity Index, and Gradation (when applicable) shall be confirmed at least once for every structure and every 2,500 cubic yards of fill placed.

2. Test every 300 linear feet of engineered fill placed for roadway embankment.

3. In addition, at least one set of applicable index tests shall be performed for each distinct material type used as compacted fill at the site.

4. Additional tests may be performed, as directed by the Owner's Representative, whenever deviations in material properties or quality of workmanship are suspected.

5. Where compaction tests indicate failure to meet the specified compaction, the Contractor will rework the entire failed area until the specified compaction has been achieved at no cost to the owner.

3.16 SURFACE FINISH WORK

A. Open Areas: Grade all disturbed areas, blending with adjacent terrain without a noticeable break. Bring all sub-grades to specified contours, even and properly compacted.

B. Paved Areas: Grade subgrade to produce a reasonably uniform surface.

C. Drainage Ditches: Restore drainage ditches to appropriate line and grade, using approved surface erosion prevention techniques.

D. Clean Up: Remove all rubbish and excess material for disposal as approved, and leave area in a neat, satisfactory condition.

3.17 TOLERANCES

A. Tolerances are defined as allowable variations from specified lines, grades, and dimensions. The intent of this paragraph is to establish tolerances that are consistent with modern construction practice yet are governed by the effect that permissible variations may have upon the construction.

B. Variations from specified lines, grades, and dimensions:

Finish Grading Tolerance:	±0.10 foot
When flatwork, pavement or structures are to be placed directly on compacted subgrade, or with only a sand leveling course, the grading plane of the subgrade at any point shall not vary more than	±0.05 foot
When aggregate base material is to be placed on the subgrade, the grading plane of the subgrade at any point shall not vary more than	±0.05 foot
Variation in elevation for invert of canal	±0.10 foot
Variation from specified width of section at any height	±0.25 foot
Departure from established alignment on tangents along the canal	0.30 foot
Departure from established alignment on curves along the canal	0.50 foot

Plus or minus variations indicate an allowable actual position up or down and in or out from the specified position in the drawings. Variations not designated as plus or minus indicate the maximum deviation permitted between designated successive points on the completed element of construction.

END SECTION

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SECTION 31 23 17

TRENCHING, BACKFILLING AND COMPACTING

PART 1 GENERAL

1.1 WORK INCLUDED

A. This section includes material, testing, installation, and other requirements for trench excavation, bedding, backfilling, and compacting for underground pipelines and utilities. Requirements in this section do not apply to underground landscape irrigation pipes. The words pipe, utility, and pipelines are interchangeable in this Section and apply to that which is being installed in the trench.

1.2 RELATED WORK

A. General and Special Provisions

B. Section 03 30 00 – Cast-in-Place Concrete

C. Section 31 05 00 – Common Work Results for Earthwork

D. Section 31 11 00 – Clearing and Grubbing

E. Section 31 23 19 – Dewatering

F. Section 32 11 23 – Aggregate Base

G. DIVISION 33 – UTILITIES

H. Section 40 05 00 – Pipe and Fittings

1.3 REFERENCES

A. ASTM C136 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ASTM D75 – Standard Practice for Sampling Aggregates.

C. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3).

D. ASTM D6938 – Density of Soil and Base Rock in Place by Nuclear method.

E. ASTM D2937 – Density of Soil In Place by Tube method.

F. Cal/OSHA Construction Safety Orders, California Code of Regulations, Chapter 4, Subchapter 4.

G. State Standard Specifications, Section 19 – Earthwork

H. State Standard Specifications, Section 26 – Aggregate Bases

I. ASTM D2321 Installation of Underground Thermoplastic Gravity Pipelines

J. AWWA Manual M23 PVC Pipe Design and Installation

K. AWWA Manual M55 PE Pipe Design and Installation

L. AWWA Manual M11 Steel Pipe: A Guide for Design and Installation

M. American Concrete Pipe Association Concrete Pipe & Box Culvert Installation Guide

N. Ductile Iron Pipe Research Association Installation Guide for Ductile Iron Pipe

O. PVC Pipe Association Installation Guide for Gasket-Joint PVC Pressure Pipe

P. National Resource Conservation Service (NRCS) Construction Specification 430 Irrigation Pipeline

Q. NRCS Construction Specification Plastic (PVC,PE) Pipe

R. U.S. Bureau of Reclamation Method for Prediction of Flexible Pipe Deflection M-25

S. U.S Department of Labor, 29 CFR, 1926, Subpart P

T. National Corrugated Steel Pipe Association (NCSPA) Corrugated Steel Pipe Design Manual

U. NCSPA Installation Manual for Corrugated Steel Pipe and Structural Plate

V. Geotechnical Engineering Investigation entitled, PROPOSED NEW RECHARGE BASIN AND SEWER IMPROVEMENT by BSK ASSOCIATES, dated JANUARY 15TH, 2024 and PROPOSED RECHARGE BASIN AND SEWER IMPROVE – NEW SIPHON BY BSK ASSOCIATES, dated FEBRUARY 27TH, 2025.

1.4 SUBMITTALS

A. Submit plans as required for worker protection against caving ground in excavations. Submittals shall be in accordance with the General and Special Provisions.

B. Submit material classification and geotechnical test results on proposed imported fill.

1.5 SAMPLES

A. Submit samples under the General and Special Provisions.

1.6 PROTECTION

A. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation.

1. Trenches shall have sloping, sheeting, shoring, and bracing conforming with Subpart P, CAL/OSHA requirements, and the Contract Documents.

B. Notify Engineer of unexpected subsurface conditions.

C. Protect bottom of excavation from frost.

D. When pipe laying is not in progress, close the open ends of pipe. Do not allow trench water, animals, or foreign material to enter the pipe.

1.7 QUALITY ASSURANCE

A. Compaction Testing:

1. All compaction testing shall be in accordance with the General and Special Provisions and performed in accordance with Section 19-5 of the State Standard Specifications.

2. Compaction tests will be performed for each lift or layer.

3. Tests for compaction shall conform to ASTM D1557 and D6938.

4. Sample aggregates to be used for backfill materials per ASTM D75 and test them per ASTM C136.

1.8 CONTROL AND DIVERSION OF WATER

A. The Contractor shall control and divert water as specified in Section 31 23 19.

B. General – The Contractor shall furnish or procure all materials and labor required for constructing and maintaining all necessary cofferdams, channels, flumes, drains, sumps, and/or other temporary diversion and protective works and shall furnish, install, maintain, and operate all necessary pumping and other equipment for removal of water from the various parts of the work and for maintaining the foundations, trenches and other parts of the work free from water. The Contractor shall at all times have on the project sufficient pumping equipment for immediate use, including stand-by pumps for use in case other pumps become inoperable.

C. Plan – Prior to beginning any work; the Contractor shall submit for the Engineer's approval a water control plan showing the proposed method for the removal of water from foundations, trenches, and other parts of the work.

D. Dispose of the water in a manner that will prevent damage to the adjacent property and in accordance with regulatory requirements.

E. Devices to control and divert water shall be adequately filtered to prevent the removal of fines from the soil.

F. Provide separate pipelines to drain trench water during construction.

G. Repair any damage caused by the failure of any part of equipment to control and divert water. Remove temporary equipment to control and divert water when no longer needed for dewatering purposes.

H. Provision of equipment to control and divert water shall be considered part of the project with no additional compensation allowed.

I. Drain rock will not be allowed in trenches.

1.9 PROJECT CONDITIONS

A. Existing underground utilities may exist at this site. Contractor shall take all necessary precautions to protect said utilities. Notify Engineer of any deviation in utility location from that which is shown on the drawings.

B. Obtain all required permits and licenses before installing utilities and follow the rules and requirements of authorities having jurisdiction.

C. Arrange construction sequences to provide the shortest practical time that the trenches will be open to avoid hazard to the public, and to reduce the possibility of trench collapse.

1.10 DEFINITION

A. Percent Compaction: The ratio of the field-tested dry density of earthfill to the maximum dry density determined in the laboratory according to the above-referenced Laboratory compaction test method – expressed as a percentage.

B. Unsuitable Material – Unsuitable material is material determined to be:

1. Impossible and/or incapable to compact to specified density using ordinary methods at optimum moisture content.

2. Material containing trash, debris, oversized material, or other foreign and objectionable materials.

3. Too wet to be properly compacted if circumstances prevent satisfactory in-place drying prior to incorporation into the work.

4. Non-native material containing a significant amount of permeable materials, such as sand or rock, that cannot be blended with other material and requires to be off hauled.

5. Expansive clays that cannot be mixed or treated and requires to be off hauled.

6. Otherwise unsuitable for the planned use.

C. Deflection is the decrease of the vertical diameter of the pipe (and corresponding increase in horizontal diameter) due to load on the pipe. Deflection is expressed in terms of percentage as follows: change in diameter/ diameter × 100).

D. Ovality% = 2 x [(Dmax-Dmin)/(Dmax +Dmin)] x 100 where Dmax and Dmin are maximum and minimum pipe diameters in any direction.

1.11 CLASSIFICATION AND CHARACTERIZATION OF EXCAVATED MATERIAL

A. The Geotechnical Engineering Report provides subsurface data.

PART 2 PRODUCTS

2.1 EXISTING GROUND AND BACKFILL

A. Existing Ground: In-situ soil or bedrock that the Contractor excavates for trenches. The Contractor may use this excavated material as backfill if it meets backfill material property requirements and/or if they process it so that it meets those requirements.

B. Backfill: Soil fill that the Contractor places and compacts in trenches over granular backfill and aggregates and that meets material property requirements of the geotechnical engineering report and the Contract Documents. Backfill may consist of existing ground or imported earth material. The Engineer shall approve backfill before it is imported to the site and placed.

2.2 GRANULAR BACKFILL AND AGGREGATES

A. **Granular Backfill**: material meeting the requirements of State Standard Specifications Section **19-3.02C Structure Backfill.**

B. Class 2 Aggregate Base: material as specified for ¾" maximum grading in the State Standard Specifications, Section 26-1.02B.

C. Material from concrete crushing operations may be used as granular backfill provided it meets the above requirements.

D. Gravel: Pit run, natural stone; free of shale, clay, friable materials, and debris; graded in accordance with 1½" x ¾" aggregate grading in Section **90-1.02C "Aggregates",** State Standard Specifications.

E. Sand: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter, graded in accordance with State Standard Specifications Section 90-1.02C(4)(c):

2.3 CONCRETE SLURRY

A. Concrete slurry mix shall be as specified in Section 03 30 00 - Cast-in-Place Concrete.

2.4 MATERIALS FOR TRENCH BACKFILLING

A. Furnish required bedding, select backfill, and backfill materials shown on the Plans and that meets requirements in this section depending on the trench type.

B. The Engineer shall approve all trench-backfill material prior to the Contractor's import and placement.

C. Materials used in backfill, as shown in trench details, are defined as follows:

1. Bedding: Where trench bottoms expose bedrock and/or soil with hard gravel/cobble particles that protrude up into the excavation, and when trench subgrades consist of soft and unstable soil, then bedding is required. Bedding may be omitted if, in the opinion of the Engineer, the excavated trench bottom will adequately support and not damage the utility line. Material property requirements for bedding follow:

   a. Less than 2 percent of organics by dry weight

   b. Plasticity index of less than 6

   c. The following particle size distribution:

Sieve Size	Percent Passing by Dry Weight
3/8 inch	100
No. 200	5

   d. Sand Equivalent of 30, per ASTM D2419.

2. **Manhole Bedding: Bedding material properties shall adhere Detail 7 in Sheet D1 – City of Los Banos Standards. Bedding material property shall adhere to Class 1 Bedding. shall meet Class 1 Bedding material properties.**

3. Backfill: Backfill shall meet the material property requirements in the Geotechnical Engineering report and the material property requirements that follow:

   a. Less than 2 percent by dry weight of organics

   b. Plasticity index of less than 16

   c. The following particle size distribution:

Sieve Size	Percent Passing by Dry Weight
8-inch	100
4-inch	90
¾-inch	70
No. 4	60

4. **Manhole Backfill: Backfill material properties shall adhere Detail 7 in Sheet D1 – City of Los Banos Standards. Bedding material property shall adhere to Class 1 Bedding. shall meet Class 1 Bedding material properties.**

5. Engineered fill: Engineered fill shall meet the material property requirements in the Geotechnical Engineering report and the material property requirements that follow:

   a. Less than 3 percent by dry weight of organics

   b. Maximum particle size of 3 inches

   c. Plasticity index of less than 12

   d. Expansion Index of less than 20

   e. The following particle size distribution:

Sieve Size	Percent Passing by Dry Weight
8-inch	100
4-inch	100
¾-inch	100
No. 4	65 - 100
No. 200	30 - 45

6. Gravel: Gravel shall meet the requirements listed above under Granular Backfill and Aggregates.

7. Pea Gravel: Pea gravel shall meet the requirements listed above under Granular Backfill and Aggregates

8. Sand: Sand shall meet the requirements listed above under Granular Backfill and Aggregates.

2.5 SAND-CEMENT SLURRY

A. Sand-cement slurry backfill shall be as specified in Section 03 30 00 – Cast-in-Place Concrete.

2.6 WATER FOR FILL MOISTURE CONDITIONING AND COMPACTION

A. Water shall be free of organic materials injurious to the pipe coatings, have a pH of 7.0 to 9.3, maximum chloride concentration of 500 mg/l, and a maximum sulfate concentration of 500 mg/l.

PART 3 EXECUTION

3.1 GENERAL

A. Excavation shall be by open cut except that short sections of a trench may be tunneled if the utilities can be safely and properly installed and backfill can be properly compacted in such tunnel sections.

3.2 INSPECTIONS

A. The contractor must verify that the engineer has approved stockpiled material for reuse as backfill material (for each backfill zone for intended use).

B. The contractor shall verify that trenches that they will backfill are free of debris, snow, ice, or water, and that ground surfaces that backfill will cover are not frozen.

3.3 PREPARATION

A. Identify required lines, levels, contours, and datum.

3.4 AC PAVEMENT AND CONCRETE REMOVAL

A. Cut bituminous and concrete pavements, regardless of the thickness, curbs, gutters, and sidewalks prior to excavation of trenches.

1. The contractor shall saw cut existing pavement at least one lateral foot beyond (outside of) the trench edges or further out as shown on the Plans.

2. The contractor shall remove all pavement and aggregate within the saw cuts.

3. AC pavement and concrete rubble shall not be used for trench backfill.

4. The contractor shall replace aggregate, and pavement surfaces according to Specification Section 32 12 16 Asphalt Concrete Paving.

3.5 TRENCH EXCAVATION

A. Excavate the trench to the lines and grades shown on the Plans with allowance for pipe thickness, sheeting, shoring, and bedding.

B. Trenching Guidelines: Excavate the trench to the approximate level of the grade of the utility line to be installed, using adequate trench width and side slopes to safely accommodate worker access.

1. Rocky Trench Bottom: Where ledge rock, hard pan, boulders, or sharp-edged materials are encountered, over excavate trenches at least 6 inches below and beyond the planned excavation lines. The installed utility shall have at least 6 inches of clearance from any rock protrusion.

2. Unstable Trench Bottom: Secure the Engineer’s approval of over-excavation depth and stabilization method. The Contractor must seek the Engineer’s approval of overexcavation bottoms and subgrades before the Contractor backfills and places utility pipes/conduits.

3. Wet Trench Construction: use approved method of dewatering through diversion, damming and pumping, well points, or underdrain systems. Dispose removed fluidized materials as approved. Use bedding material to build a suitable foundation to within 6 inches of finished utility grade, prior to bedding with the specified material. Place and compact backfill as specified.

The Contractor must seek the Engineer's approval of overexcavation bottoms and subgrades before the Contractor backfills and places utility pipes/conduits.

C. Correct unauthorized excavation at no cost to Owner.

1. If the trench is excavated below the required grade, backfill over-excavations with compacted engineered fill as specified.

D. Trench widths shall be as shown on the Plans. If no details are shown, then the maximum width in the pipe zone shall be 24 inches greater than the pipe outside diameter.

E. Trench width at the top of the trench will not be limited except where width of excavation would undercut adjacent structures and footings. In such case, width of trench shall be such that there is at least two feet between the top edge of the trench and the structure or footing.

F. Excavation shall not interfere with normal 45 degree bearing splay of foundations.

G. Hand trim for bell and spigot pipe joints.

H. During trench excavation, place the excavated material only within the working area. Do not obstruct roadways or streets. Follow Caltrans guidelines for excavation safety for conditions of surcharge from stockpiled material.

3.6 LENGTH OF OPEN TRENCH

A. Limit the length of open trench to six hundred (600) feet in advance of pipe laying or amount of pipe installed in one working day.

B. Complete backfilling, temporary or first layer paving, not more than 400 feet in the rear of pipe laying operation.

3.7 TRENCH EXCAVATION IN EMBANKMENT AREAS

A. Construct and compact fill embankments to an elevation one foot, minimum, over the top of the largest pipe or conduit to be installed prior to trench excavation.

3.8 UNSUITABLE MATERIAL

A. Unsuitable material shall be excavated and disposed of in a lawful manner off the project site, all disposal shall be approved by the Engineer prior to initiating the work.

3.9 CONTROL OF WATER

A. The Contractor shall keep trenches free from water, maintain and operate all necessary pumping and other equipment for dewatering of excavations.

B. The dewatering operation shall be continuous, so that the excavated areas are kept free from water during the construction.

C. Do not drain trench water through pipeline under construction but use separately provided pipeline.

D. Repair any damage caused by the failure of any part of equipment to control and divert water. Remove temporary equipment to control and divert water when no longer needed for dewatering purposes.

E. Drain rock will not be allowed in trenches.

3.10 TRENCH BACKFILLING

A. Support pipe during placement and compaction of bedding fill.

B. Backfilling and cleanup work shall be accomplished as sections of pipe or conduit are tested and approved.

C. Compaction: The contractor shall choose means and methods for achieving compaction. Generally, vibratory compactors tend to work better for sands and gravels (non-cohesive soils) and mechanical tampers work better for sand and gravel containing a significant portion of fine-grained materials, such as silt and clay (cohesive soils).

D. Hand tamp around pipe or cable to protect the lines until adequate cushion is attained. Puddling or water flooding for consolidation of backfill or compaction by wheel rolling will not be permitted.

E. Bedding: Unless otherwise specified, compact the specified material to 90 percent of maximum density to the finished utility grade.

F. Embedment: Fill by hand placement around the utility to just over half depth, and compact in a manner to ensure against lateral or vertical displacement. Place select backfill to 12 inches above the utility line by hand placement in not more than 6-inch layers.

G. Backfill: Soil backfill shall be placed and backfilled in lifts, with each lift compacted to the project requirements prior to addition of the next layer. Unless otherwise specified, place and compact the specified material as follows:

1. Vehicular Traffic Areas: Fill and compact in 8-inch maximum loose lifts as follows:

   a. From top of select backfill to one feet below top of subgrade, compact to 90 percent compaction.

   b. From one feet below top of subgrade to top of subgrade, compact to 95 percent compaction.

2. Non-traffic Areas: Fill and compact in 8-inch maximum layers to 90 percent compaction.

H. Employ a placement method that will not disturb or damage pipes or utilities.

I. Maintain moisture content of backfill materials to attain required compaction density.

J. Compact trench-backfill to the specified percent compaction. Compact by using mechanical compaction or hand tamping. Do not use high impact hammer type equipment except where the pipe manufacturer warrants in writing that such use will not damage the pipe. Do not use water flooding or jetting for backfill compaction.

K. Compact material placed within 12 inches of the outer surface of the pipe by hand tamping only.

1. Carefully place the material around the pipe so that the pipe barrel is completely supported and that no voids or uncompacted areas are left beneath the pipe.

2. Use particular care in placing material on the underside of the pipe to prevent lateral movement during subsequent backfilling.

L. After pipe has been bedded, place pipe zone material simultaneously on both sides of the pipe, in maximum 8-inch lifts, keeping the level of backfill the same on each side.

M. Do not use any axle-driven or tractor-drawn compaction equipment within 5 feet of building walls, foundations, and other structures.

N. Do not permit free fall of the material until at least two feet of cover is provided over the top of the pipe. Do not drop sharp, heavy pieces of material directly onto the pipe or on the surface of compacted backfill around the pipe. Do not operate heavy equipment over the pipe until at least 3 feet of backfill has been placed and compacted over the pipe.

O. Remove surplus backfill materials from site.

P. Leave stockpile areas completely free of excess fill materials.

*3.11 **MANHOLE BACKFILLING***

A. **As specified in Detail 7 – Sewer Manhole Backfill in Sheet D1 within the Project Plans.**

3.12 TESTING FREQUECY

A. Backfill Compaction:

Pipeline Trenches: At least 1 test per lift per every 200 feet of trench backfill placed or every 500 cubic yards placed, whichever is more frequent.

A greater frequency of testing may be required at the start of work or when new materials, crews, or equipment are introduced to the site. A lesser frequency can be utilized if approved by the Engineer and the Owner’s Representative.

B. Laboratory Index Testing:

In addition, at least one set of index tests shall be performed for each distinct material type used as compacted fill at the site.

Additional tests may be performed, as directed by the Owner's Representative, whenever deviations in material properties or quality of workmanship are suspected.

3.13 TOLERANCES

A. Top Surface of trench backfill: +/- 0.1 foot.

3.14 SAND CEMENT SLURRY, CONCRETE ENCASEMENT AND THRUST BLOCKS

A. Place in accordance with the Contract drawings and Section 03 30 00 – Cast-In-Place Concrete.

3.15 PIPE DEFLECTION AND OVALITY CONTROL

A. Pipe installation and backfill process shall be done in a manner that does not overly deflect pipe or make it overly oval in any direction so that deflection or ovality limits in pipe specifications or installation guidelines are exceeded. The following table has common deflection and ovality limits for flexible pipes but pipe specifications and installation guidelines shall govern over this table. Owner has the option to hire a third-party testing firm to conduct pipe mandrel testing to verify the pipe installation is within the following requirements or as stated in the individual pipe specification sections.

Pipe Type	Deflection and Ovality Limit
PVC Pressure, Sewer, or Gravity Pipe	7.5%
Steel with Flexible Coating	5%
Cement Mortar Lined Steel with flexible coating	3%
Cement Mortar Coated Steel	2%
Cement Mortar Lined and Coated Steel	2%
Solid Wall HDPE	7.5% for DRs ≥ 21, 6.0% for DRs ≥13.5 and < 21 5.0% for DR 11, 4.0% for DR 9, 3.0% for DR 7.3
Corrugated HDPE	12" and smaller 5% >12" to 30" 4% >30" to 60" 3%
Corrugated Steel Pipe	Per manufacturer's guidelines

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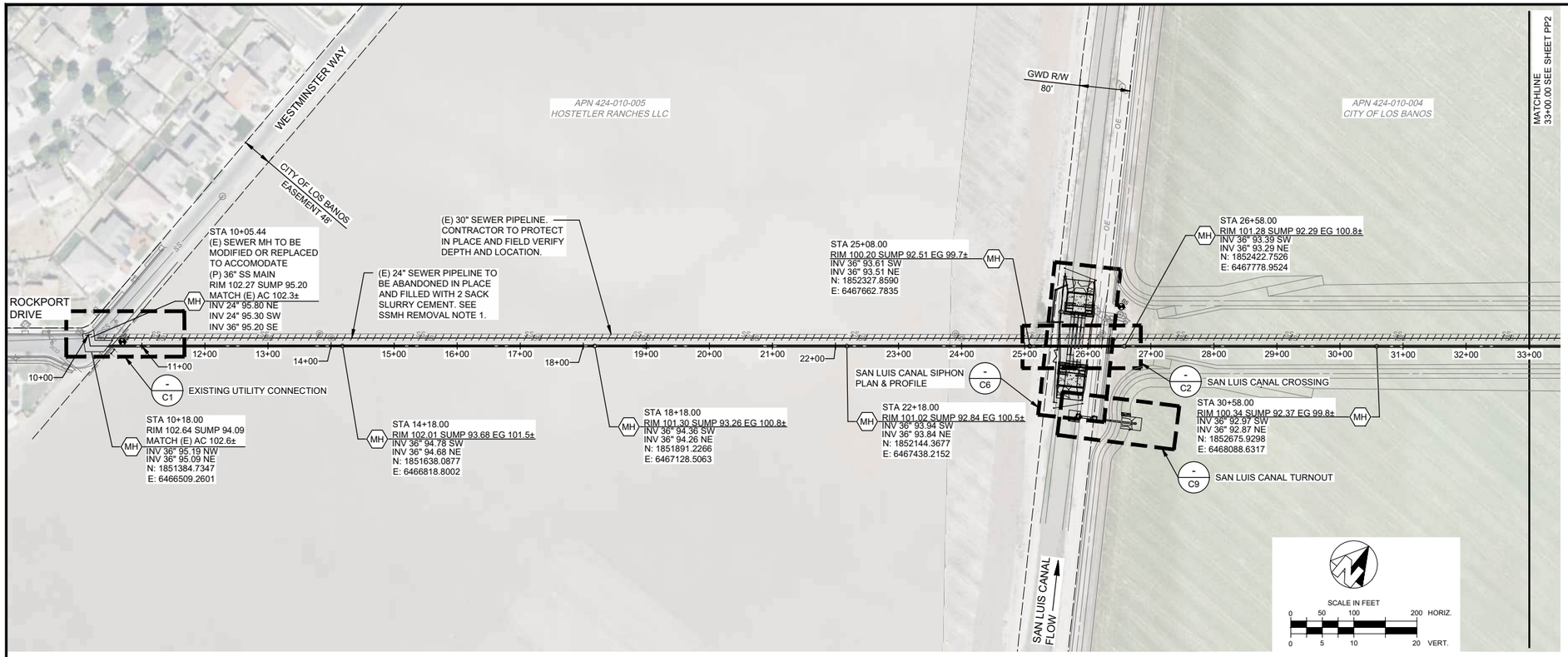
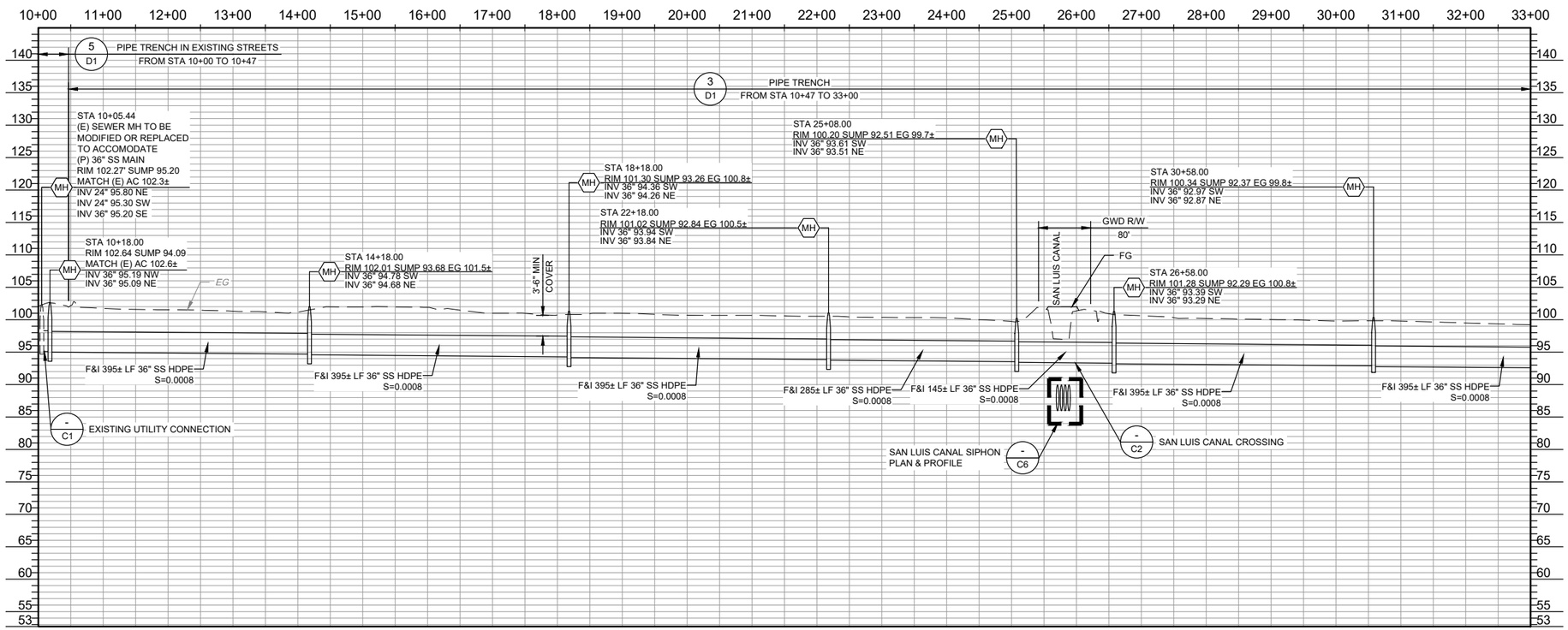




Attachment 6

WARNING
POWER LINES OVERHEAD

811 Know what's below. Call before you dig.

CONSTRUCTION LEGEND

- MH — CONSTRUCT 60" MANHOLE — 1 / D1
- SJB — CONSTRUCT SEWER JUNCTION BOX — 1 / D3
- P — SAWCUT AND REMOVE (E) ASPHALT PAVEMENT. CONSTRUCT PAVEMENT PLUG. — 5 / D1
- SC — R&R AC ROADWAY PAVEMENT AND CURB & GUTTER — 5 / D1 and 6 / D1 (1)
- AC — ALIGNMENT CHANGE

CONSTRUCTION NOTES

1. PROTECT EXISTING UTILITIES.
2. CONTRACTOR SHALL FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING FACILITIES PRIOR TO COMMENCING WORK. CALL UNDERGROUND SERVICE ALERT (USA) AT 8-1-1. CONTRACTOR SHALL MAKE ENGINEER AWARE OF ANY DISCREPANCIES.
3. ALL SAWCUT LINES SHALL BE STRAIGHT AND NEAT TO MATCH EXISTING CONDITIONS.
4. RIM ELEVATION OF PROPOSED MANHOLES IN UNPAVED AREAS SHALL BE 6" ABOVE EXISTING GRADE.
5. PAVEMENT SHALL BE REPLACED ACCORDING TO MERCED COUNTY/CITY OF LOS BANOS STANDARDS AND PAVING DETAIL ON SHEET D1.
6. CONTRACTOR SHALL FURNISH AND INSTALL SEWER BYPASS WITH A DRY PEAK FLOW OF 5.0 MGD AND WET PEAK FLOW OF 12.0 MGD.
7. CONTRACTOR TO CONSTRUCT A CONCRETE APRON IN MANHOLES LOCATED IN UNPAVED AREAS PER DETAIL 5 ON SHEET D3

SSMH REMOVAL NOTES

1. (P) 36" Ø SEWER PIPELINE SHALL BE OPERATIONAL BEFORE ANY ABANDONMENT IN PLACE OF (E) 24" Ø SEWER MAIN AND (E) SEWER MANHOLES.
2. ABANDON (E) SEWER MANHOLES IN PLACE. REMOVE CONE SECTION OF MANHOLE TO 4' BELOW FINISH GRADE. FILL MANHOLE WITH 2 SACK SLURRY CEMENT AND COVER WITH LOOSELY COMPACTED NATIVE MATERIAL TO FINISH GRADE.
3. PLUG ALL PIPE PENETRATIONS WITH WATERTIGHT PLUG (BRICK AND MORTAR).
4. ABANDON IN PLACE (E) 24" Ø SS MAIN AND FILL WITH 2 SACK SLURRY CEMENT.

NOTES

1. BASINS ARE SHOWN FOR REFERENCE. NO EARTHWORK FOR BASINS SHALL TAKE PLACE IN THIS CONTRACT.

100% DESIGN PLANS
FOR BIDDING PURPOSES ONLY
03/05/2025

No.	REVISION	BY	DATE
1	ADDENDA 1	KK	05-14-2025

DATE SIGNED: 03/05/2025

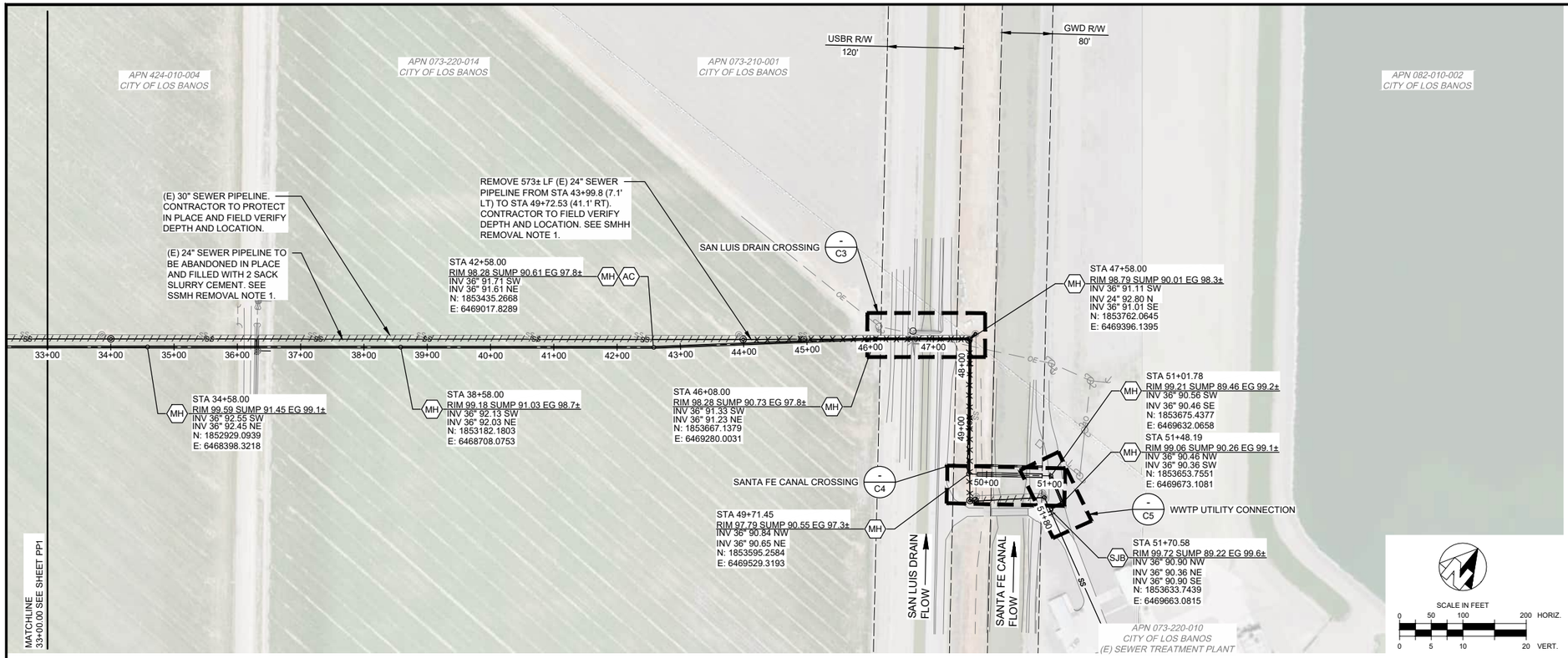
KIRK KOESTER No. 88513 REGISTERED PROFESSIONAL ENGINEER STATE OF CALIFORNIA CIVIL

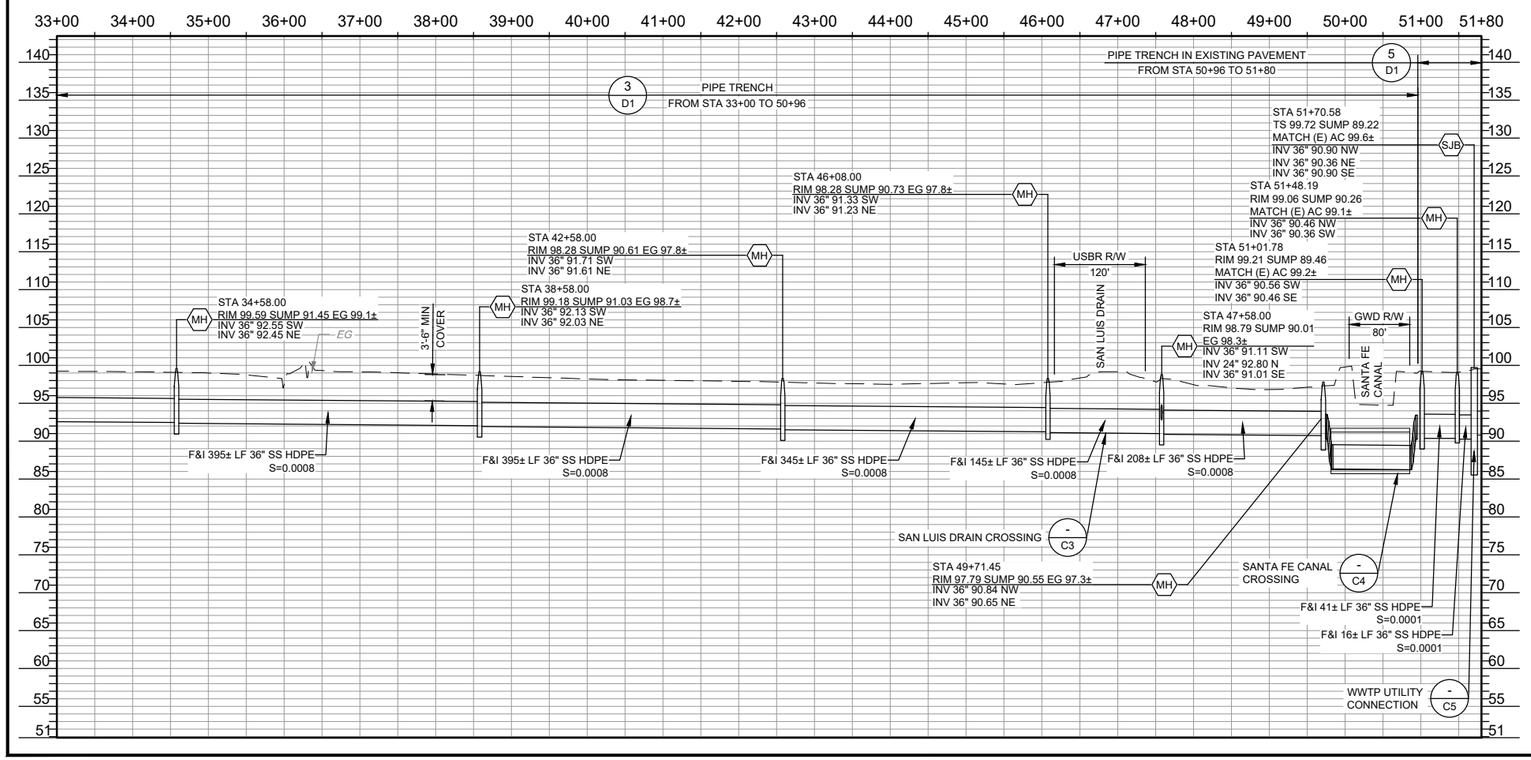
FINAL KILOMETER SEWER TRUNK LINE REPLACEMENT PROJECT
CITY OF LOS BANOS
IN MERCED COUNTY
PLAN & PROFILES
STA 10+00 TO 33+00

PROVOST & PRITCHARD
249 W. PACHECO BLVD, SUITE B
LOS BANOS, CALIFORNIA 93635
PHONE (209) 826-9696
FAX (209) 826-1675
www.provostandpritchard.com

DESIGN ENGINEER: KIRK KOESTER
LICENSE NO: RCE 88513
DRAFTED BY: PD, CAJ
CHECKED BY: KK, GMH
DATE: 03/05/2025
JOB NO: 350123011
PROJECT NO: CLB 2023-019
PHASE:
0 1"
ORIGINAL SCALE SHOWN IS ONE INCH. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.
SHEET PP1
7 OF 33

3/14/2025 3:16 PM G:\Los Banos_City of\350113501\23011-Sewer Pipeline Replacement at WWTP\300 CAD\340 Sheet Sets\Sewer Pipeline Replacement\03_Plan_&_Profiles\PP1 STA 10+00 TO 33+00.dwg Ivan Reyes-Chapa





WARNING
POWER LINES OVERHEAD

811
Know what's below.
Call before you dig.

CONSTRUCTION LEGEND

- MH — CONSTRUCT 60" MANHOLE — 1 / D1
- SJB — CONSTRUCT SEWER JUNCTION BOX — 1 / D3
- P — SAWCUT AND REMOVE (E) ASPHALT PAVEMENT. CONSTRUCT PAVEMENT PLUG. — 5 / D1
- SC — R&R AC ROADWAY PAVEMENT AND CURB & GUTTER — 5 / D1 and 6 / D1 (1)
- AC — ALIGNMENT CHANGE

CONSTRUCTION NOTES

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NOTES

1. BASINS ARE SHOWN FOR REFERENCE. NO EARTHWORK FOR BASINS SHALL TAKE PLACE IN THIS CONTRACT.

100% DESIGN PLANS
FOR BIDDING PURPOSES ONLY
03/05/2025

No.	REVISION	BY	DATE
1	ADDENDA 1	KK	03-14-2025

REGISTERED PROFESSIONAL ENGINEER
KIRK KOESTER
No. 88513
STATE OF CALIFORNIA
CIVIL

DATE SIGNED: 03/05/2025

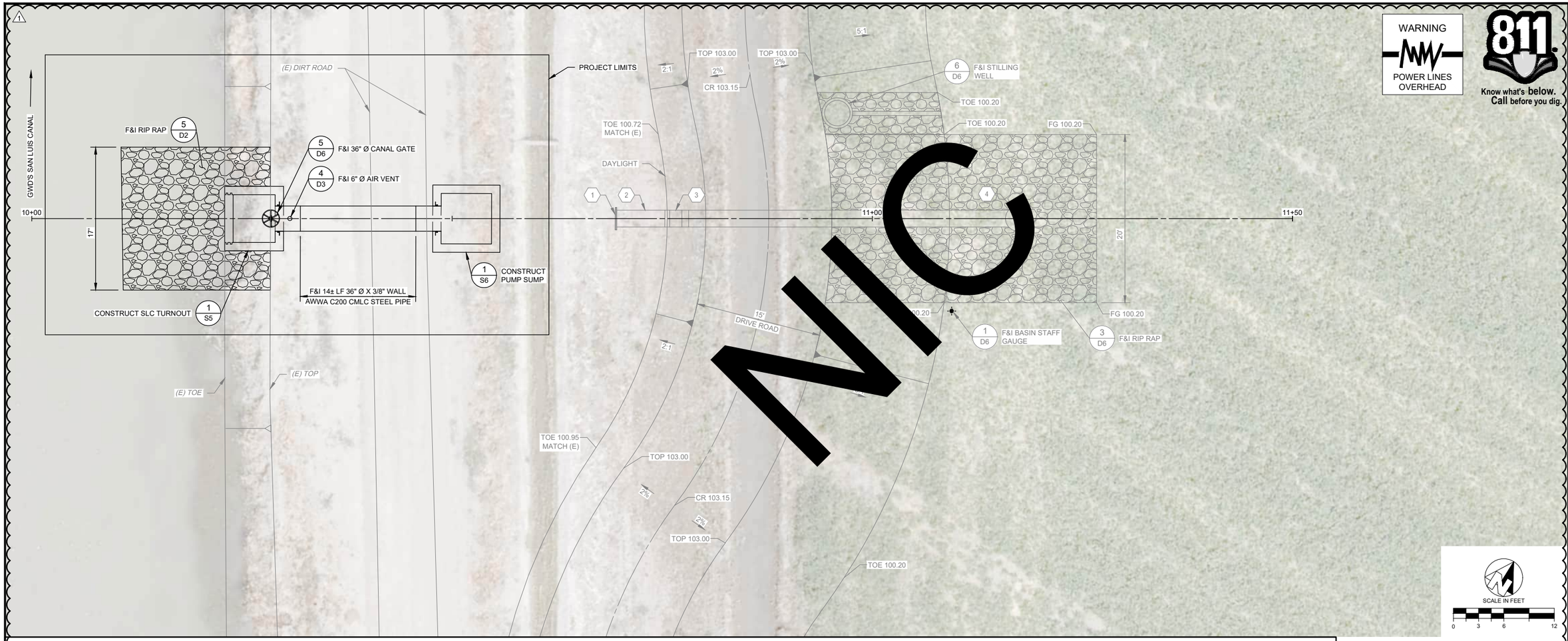
FINAL KILOMETER SEWER TRUNK LINE
REPLACEMENT PROJECT
CITY OF LOS BANOS
IN MERCED COUNTY
PLAN & PROFILES

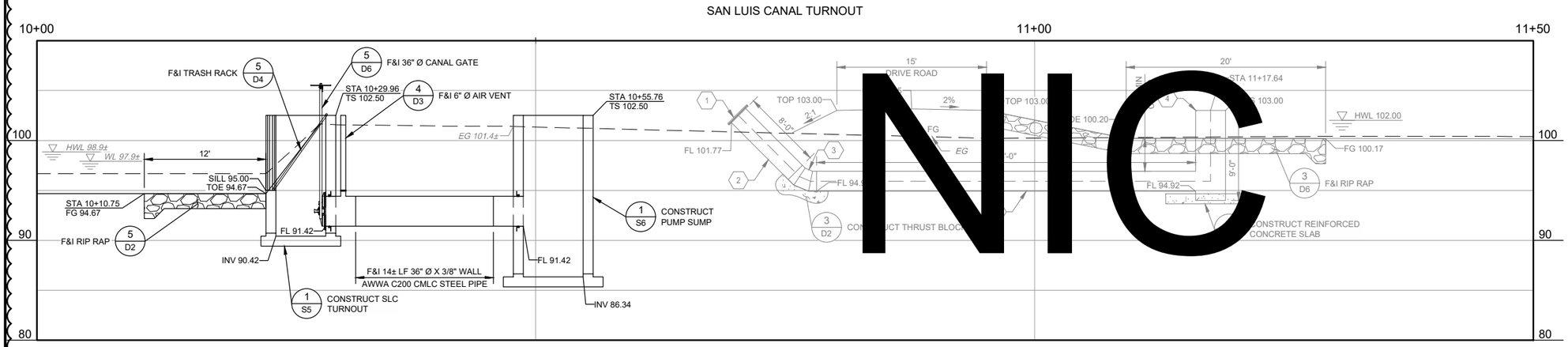
STA 33+00 TO 51+80

PROVOST & PRITCHARD
249 W. PACHECO BLVD, SUITE B
LOS BANOS, CALIFORNIA 93635
PHONE (209) 826-8965
FAX (209) 826-6575
www.provostandpritchard.com

DESIGN ENGINEER: KIRK KOESTER
LICENSE NO: RCE 88513
DRAFTED BY: PD, CAJ
CHECKED BY: KK, GMH
DATE: 03/05/2025
JOB NO: 350123011
PROJECT NO: CLB 2023-019
PHASE:
ORIGINAL SCALE SHOWN IS ONE INCH. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.
SHEET PP2
8 OF 33

3/14/2025 3:17 PM G:\Los Banos_City of\350\123011\350123011-Sewer Pipeline Replacement at WWTP\300 CAD\340 Sheet Sets\Sewer Pipeline Replacement\03_Plan_&_Profiles\PP2 STA 33+00 TO 51+80.dwg Ivan Reyes-Chaipa





CONSTRUCTION LEGEND

1. F&I 24" Ø AWWA C207 BLIND FLANGE
2. F&I 24" Ø X 3/8" WALL AWWA C200 CMLC STEEL PIPE
3. F&I 24" Ø AWWA C208 CMLC FABRICATED 45° 3 PIECE ELBOW (PE X FLG)
4. F&I 36" Ø X 3/8" WALL AWWA C200 CMLC STEEL PIPE

NOTES

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WARNING
POWER LINES OVERHEAD

811 Know what's below. Call before you dig.

SCALE IN FEET
0 3 6 12

100% DESIGN PLANS
FOR BIDDING PURPOSES ONLY
03/07/2025

No.	REVISION	BY	DATE
1	ADDENDA 1	KK	05-14-2025

REGISTERED PROFESSIONAL ENGINEER ★ KIRK GOESTER ★ STATE OF CALIFORNIA
FOR REVIEW ONLY
DATE SIGNED: ____

FINAL KILOMETER SEWER TRUNK LINE REPLACEMENT PROJECT
CITY OF LOS BANOS
IN MERCED COUNTY
CIVIL

SAN LUIS CANAL TURNOUT

PROVOST & PRITCHARD
455 W FIR AVENUE
CLOVIS, CA 93611-0166
PHONE (559) 449-2700
FAX (559) 449-2715
www.provostandpritchard.com

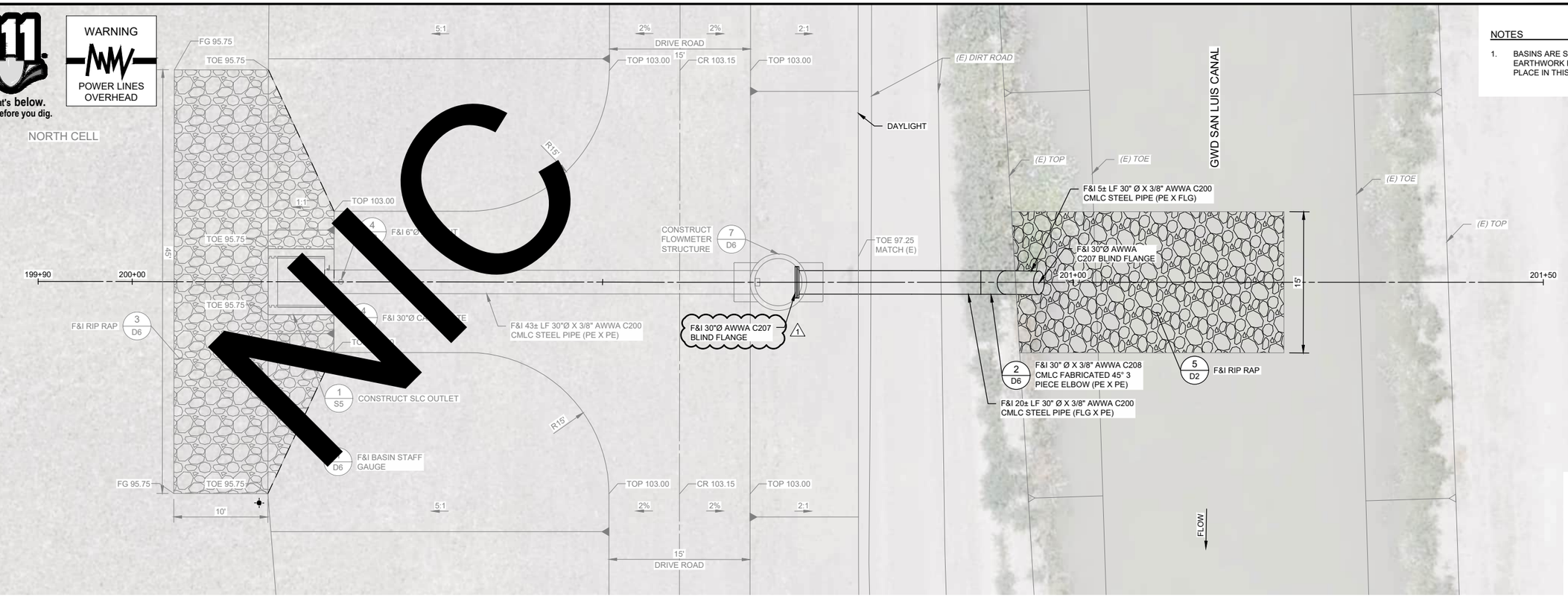
DESIGN ENGINEER: KIRK KOESTER
LICENSE NO: RCE 88513
DRAFTED BY: PD, CAJ
CHECKED BY: KK, GMH
DATE: 03/05/2025
JOB NO: 350123011
PROJECT NO: CLB 2023-019
PHASE:
0 1"
ORIGINAL SCALE SHOWN IS ONE INCH. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.
SHEET C9
17 OF 33

3/14/2025 3:21 PM G:\Los Banos_City of-350113501230\11-Sewer Pipeline Replacement at WWTP\300 CAD\340 Sheet Sets\Sewer Pipeline Replacement02_Civil\C9 SAN LUIS CANAL TURNOUT.dwg Ivan Reyes-Chapa

Know what's below. Call before you dig.

WARNING
POWER LINES OVERHEAD

NORTH CELL

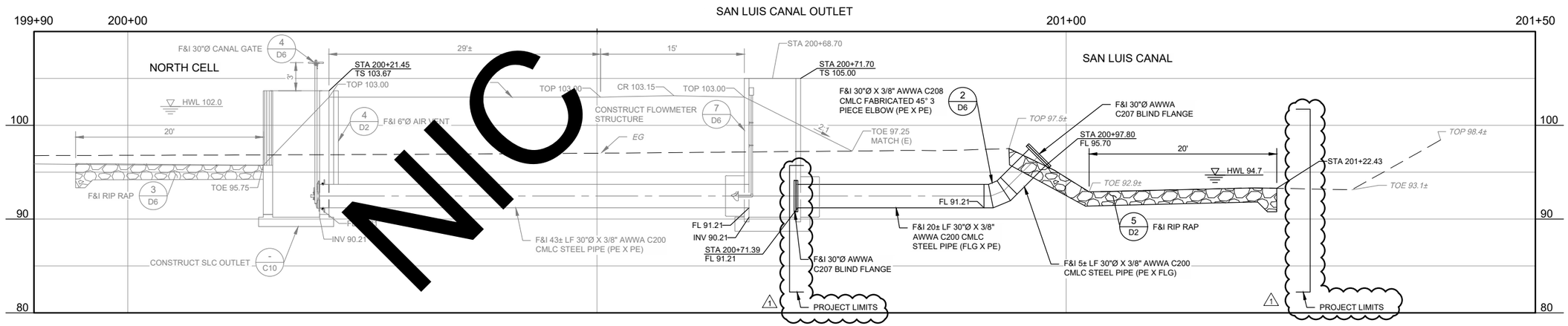


SCALE IN FEET
0 3 6 12

NOTES

1. BASINS ARE SHOWN FOR REFERENCE. NO EARTHWORK FOR BASINS SHALL TAKE PLACE IN THIS CONTRACT.

SAN LUIS CANAL OUTLET



100% DESIGN PLANS
FOR BIDDING PURPOSES ONLY
03/07/2025

No.	REVISION	BY	DATE
1	ADDENDA 1	KK	03-14-2025

REGISTERED PROFESSIONAL ENGINEER
KIRK M. KOESTER
No. 88513
STATE OF CALIFORNIA
FOR REVIEW ONLY

DATE SIGNED: _____

FINAL KILOMETER SEWER TRUNK LINE
REPLACEMENT PROJECT
CITY OF LOS BANOS
IN MERCED COUNTY
CIVIL

SAN LUIS CANAL OUTLET

PROVOST& PRITCHARD
455 W FIR AVENUE
CLOVIS, CA 93611-9166
PHONE (559) 449-2700
FAX (559) 449-2715
www.provostandpritchard.com

DESIGN ENGINEER: KIRK KOESTER
LICENSE NO: RCE 88513

DRAFTED BY:	CHECKED BY:
PD, CAJ	KK, GMH

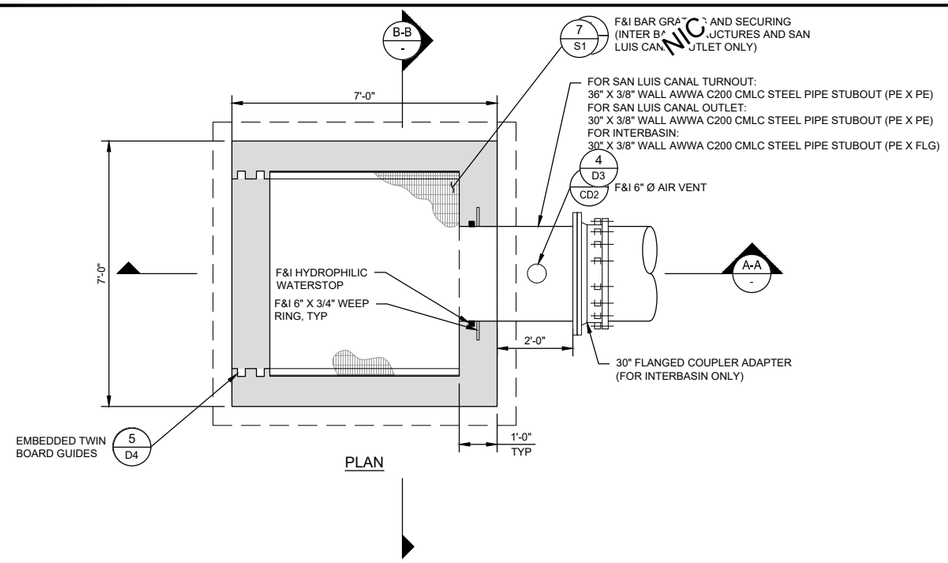
DATE: 03/05/2025
JOB NO: 350123011
PROJECT NO: CLB 2023-019
PHASE:

0 _____ 1"
ORIGINAL SCALE SHOWN IS ONE INCH. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.

SHEET C10

18 OF 33

3/14/2025 3:22 PM G:\Los Banos_City of\350113501\123011-Sewer Pipeline Replacement at WWTP\300 CAD\340 Sheet Sets\Sewer Pipeline Replacement\02_Civil\C10 SAN LUIS CANAL OUTLET.dwg - Ivan Reyes-Chapa

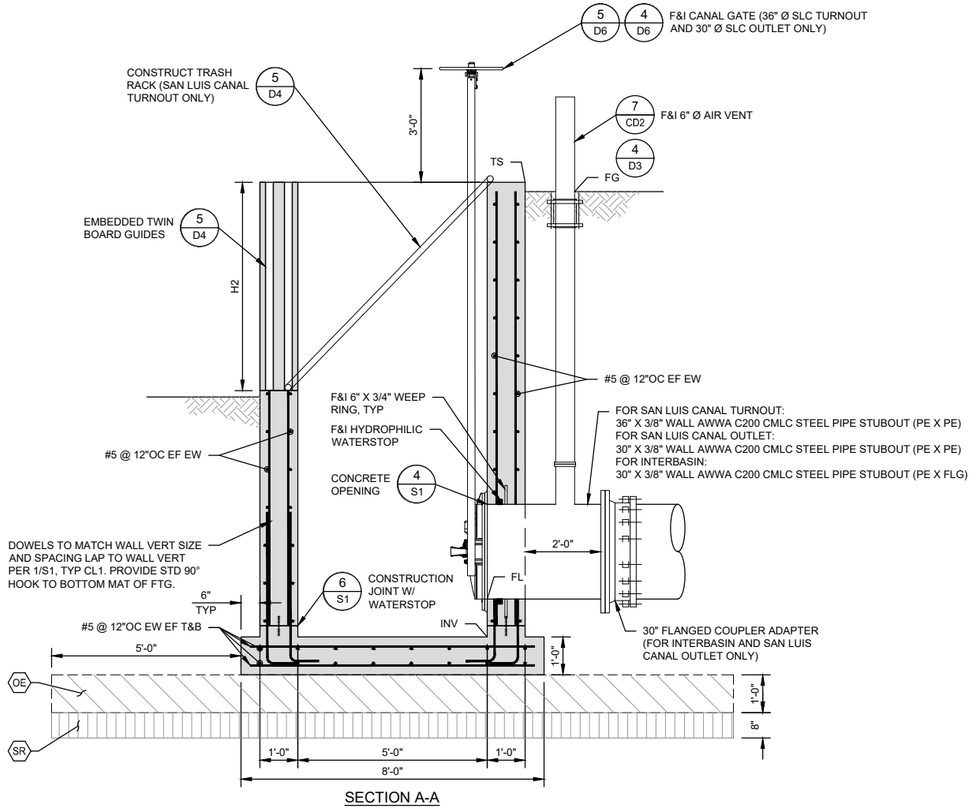


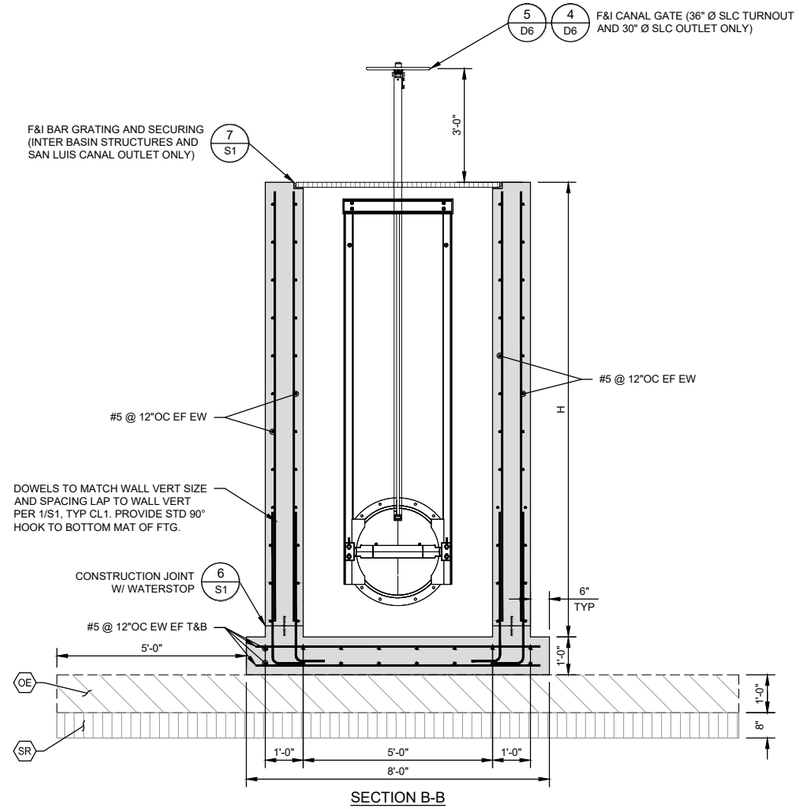
TURNOUT BOX DIMENSIONS						
STRUCTURE	H	H2	TS	FG	INV	FL
1 SAN LUIS CANAL TURNOUT	12'-1"	7'-6"	102.50	101.5±	90.42	91.42
~~SOUTH TO CENTER~~	~~12'-9"~~	~~6'-9"~~	~~103.32~~	~~103.00~~	~~91.32~~	~~92.45~~
~~CENTER TO NORTH~~	~~13'-6"~~	~~6'-11"~~	~~103.47~~	~~103.00~~	~~90.61~~	~~91.14~~
~~SLC OUTLET~~	~~13'-6"~~	~~7'-11"~~	~~103.67~~	~~103.00~~	~~90.21~~	~~91.21~~

CONSTRUCTION LEGEND

OE OVEREXCAVATE 12" MIN BELOW STRUCTURE AND MOISTURE CONDITION TO BE AT LEAST 2% ABOVE OPTIMUM MOISTURE CONTENT, AND COMPACT TO AT LEAST 90% RELATIVE DENSITY.

SR SCARIFY 8" MIN BELOW STRUCTURE AND MOISTURE CONDITION TO BE AT LEAST 2% ABOVE OPTIMUM CONTENT AND COMPACT TO AT LEAST 90% RELATIVE DENSITY.





FEET
0 1 2

1
S5

TURNOUT STRUCTURE

100% DESIGN PLANS
FOR BIDDING PURPOSES ONLY
03/05/2025

No.	REVISION	BY	DATE
1	ADDENDA 1	KK	03-14-2025

REGISTERED PROFESSIONAL ENGINEER
JAMES R. A. THAGEN
No. 53251
STRUCTURAL
STATE OF CALIFORNIA

DATE SIGNED: 03/05/2025

FINAL KILOMETER SEWER TRUNK LINE
REPLACEMENT PROJECT
CITY OF LOS BANOS
IN MERCED COUNTY
STRUCTURAL

STRUCTURES PLAN & SECTIONS

PROVOST& PRITCHARD
455 W FIR AVENUE
CLOVIS, CA 93611-9166
PHONE (559) 449-2700
FAX (559) 449-2715
www.provostandpritchard.com

DESIGN ENGINEER:
KIRK KOESTER
LICENSE NO:
RCE 88513

DRAFTED BY:	CHECKED BY:
PD, CAJ	KK, GMH

DATE: 03/05/2025
JOB NO: 350123011
PROJECT NO: CLB 2023-019
PHASE:

0 1"
ORIGINAL SCALE SHOWN IS ONE INCH. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.

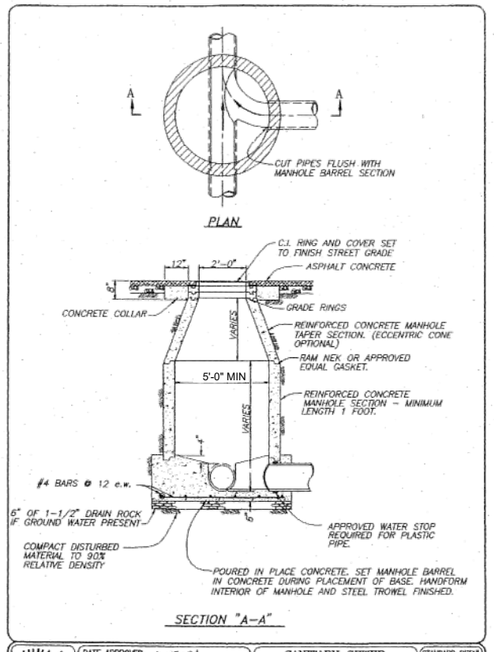
SHEET S5

24 OF 33

3/14/2025 4:17 PM G:\Los Banos_ City of-350113501230\11-Sewer Pipeline Replacement at WWTP\300 CAD\340 Sheet Sets\Sewer Pipeline Replacement\06_Structural\S5 STRUCTURES PLAN & SECTIONS.dwg Ivan Reyes-Chapa

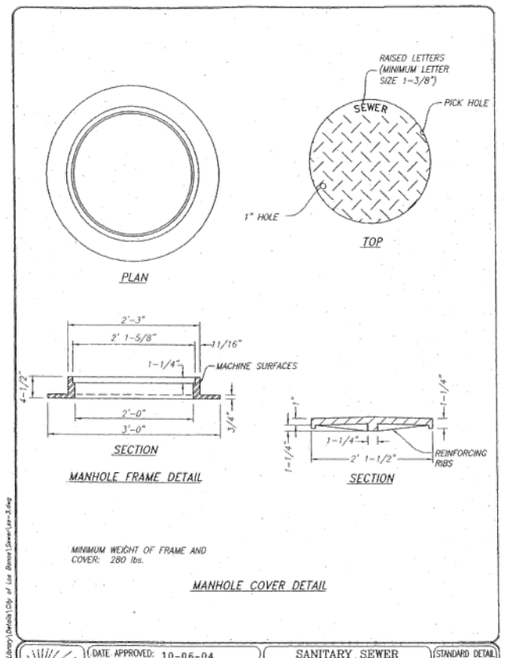
NOTES

1. ALL MANHOLES SHALL BE AT A MINIMUM 5'-0".



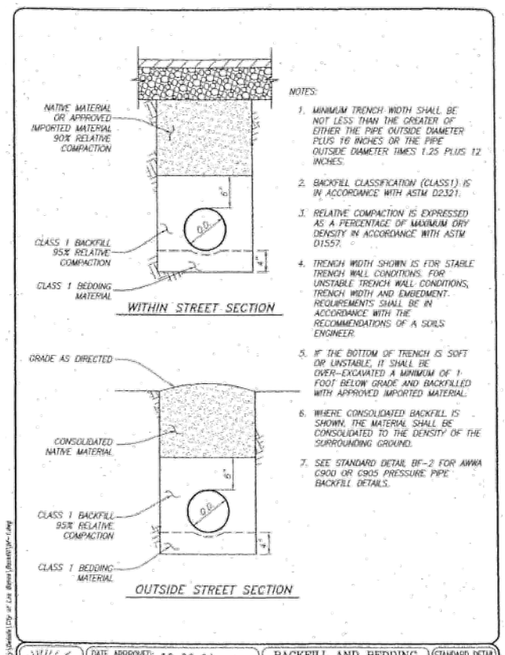
DATE APPROVED: 6-15-94	SANITARY SEWER	STANDARD DETAIL
APPROVED BY: David L. Hanson	TYPICAL MANHOLE	SS-1
DRAWN: R.D. HILL II DATE: 02/04/94	CITY OF LOS BANOS	

1 D1



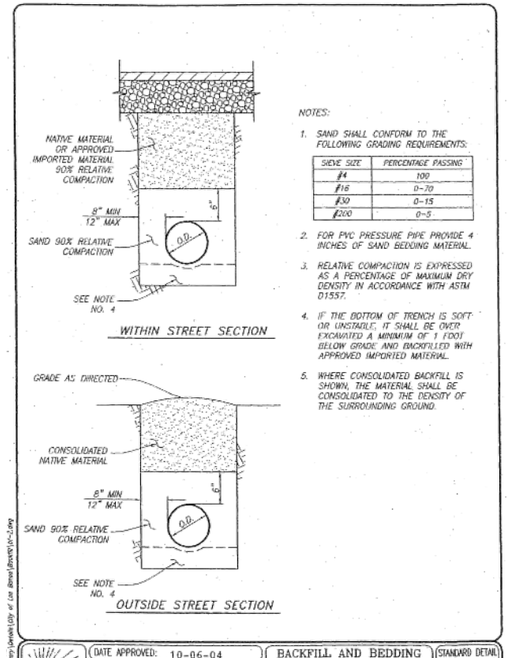
DATE APPROVED: 10-06-04	SANITARY SEWER	STANDARD DETAIL
APPROVED BY:	CAST IRON MANHOLE FRAME AND COVER	SS-3
DRAWN: MARK ARREOLA DATE: 03/17/04	CITY OF LOS BANOS	

2 D1



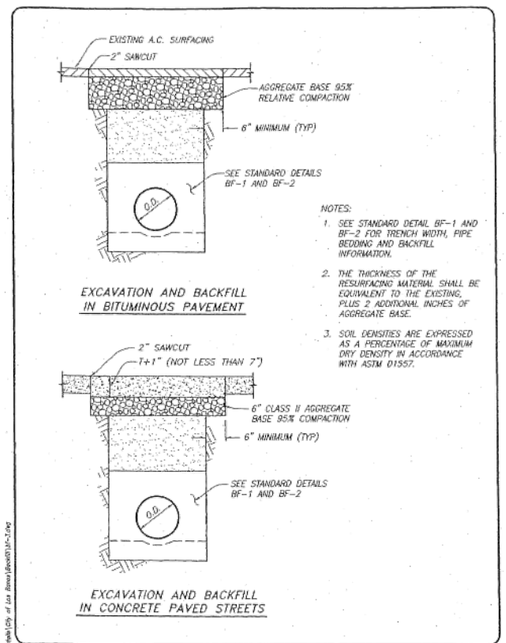
DATE APPROVED: 10-06-04	BACKFILL AND BEDDING	STANDARD DETAIL
APPROVED BY:	FLEXIBLE WALLED PIPE BACKFILL	BF-1
DRAWN: D. MORENO DATE: 03/26/04	CITY OF LOS BANOS	

3 D1



DATE APPROVED: 10-06-04	BACKFILL AND BEDDING	STANDARD DETAIL
APPROVED BY:	RIGID WALLED PIPE BACKFILL	BF-2
DRAWN: D. MORENO DATE: 03/26/04	CITY OF LOS BANOS	

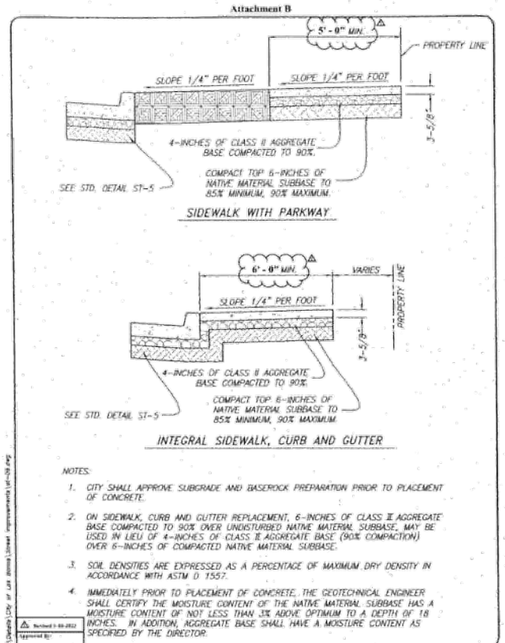
4 D1



DATE APPROVED: 10-06-04	BACKFILL AND BEDDING	STANDARD DETAIL
APPROVED BY:	EXCAVATION AND BACKFILL IN EXISTING STREETS	BF-3
DRAWN: D. MORENO DATE: 03/26/04	CITY OF LOS BANOS	

5 D1

Attachment B

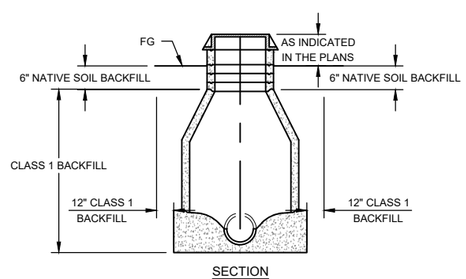


DATE APPROVED: 10-06-04	STREET IMPROVEMENTS	STANDARD DETAIL
APPROVED BY:	SIDEWALK CURB & GUTTER SECTION	ST-6
DRAWN: D. MORENO DATE: 02/25/04	CITY OF LOS BANOS	

6 D1

NOTES

1. MANHOLE CONSTRUCTION PER CITY STANDARD SS-1 TYPICAL SANITARY SEWER MANHOLE.
2. NATIVE SOIL SHALL BE COMPACTED TO 90% RELATIVE DENSITY IN UNPAVED AREAS AND TO 95% IN PAVED AREAS.
3. CLASS 1 BACKFILL SHALL BE COMPACTED TO 95% RELATIVE DENSITY.



NOT TO SCALE

SEWER MANHOLE BACKFILL

7 D1

100% DESIGN PLANS
FOR BIDDING PURPOSES ONLY
03/05/2025

No.	REVISION	BY	DATE
1	ADDENDA 1	KK	03-14-2025

REGISTERED PROFESSIONAL ENGINEER KIRK KOESTER No. 88513 CIVIL STATE OF CALIFORNIA

DATE SIGNED: 03/05/2025

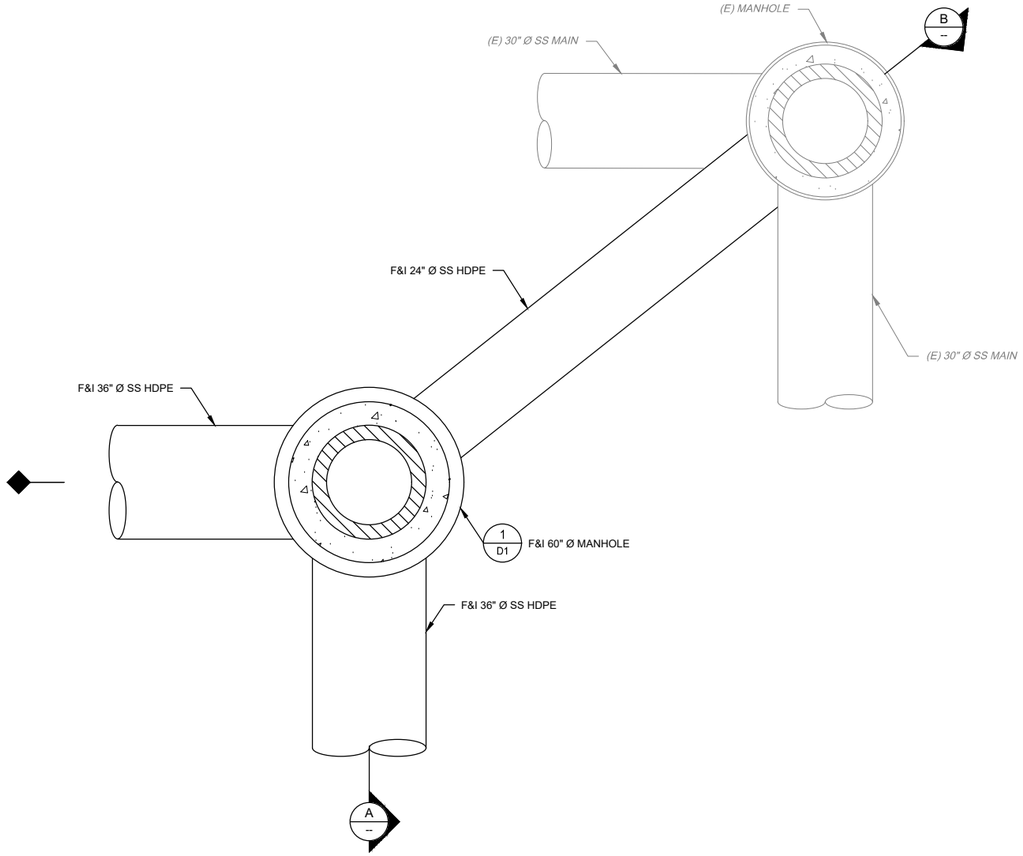
FINAL KILOMETER SEWER TRUNK LINE REPLACEMENT PROJECT
CITY OF LOS BANOS
IN MERCED COUNTY
DETAILS

CITY OF LOS BANOS DETAILS

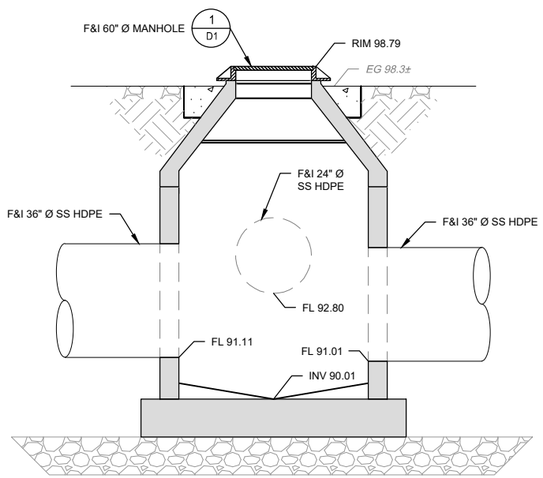
PROVOST& PRITCHARD
249 W. PACHECO BLVD, SUITE B
LOS BANOS, CALIFORNIA 93635
PHONE (209) 826-8965
FAX (209) 826-1975
www.provostandpritchard.com

DESIGN ENGINEER: KIRK KOESTER
LICENSE NO: RCE 88513
DRAFTED BY: PD, CAJ
CHECKED BY: KK, GMH
DATE: 03/05/2025
JOB NO: 350123011
PROJECT NO: CLB 2023-019
PHASE:
0 1"
ORIGINAL SCALE SHOWN IS ONE INCH. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.
SHEET D1
26 OF 33

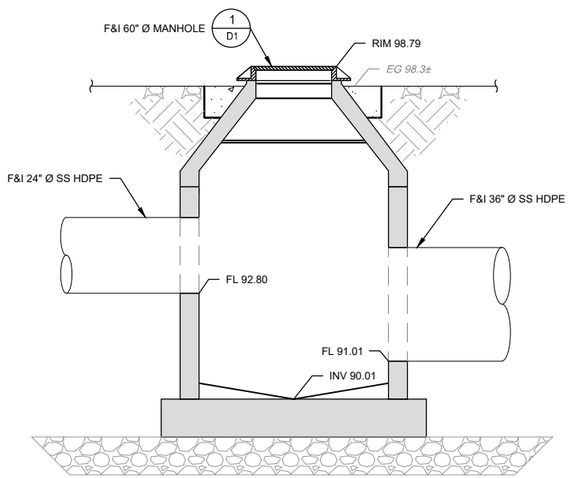
3/14/2025 4:32 PM G:\Los Banos_City of\350\135012301\1-Sewer Pipeline Replacement at WWTP\300 CAD\340 Sheet Sets\Sewer Pipeline Replacement\04_Civil_Details\D1 CITY OF LOS BANOS DETAILS.dwg -Ivan Reyes-Chapa



PLAN



SECTION A

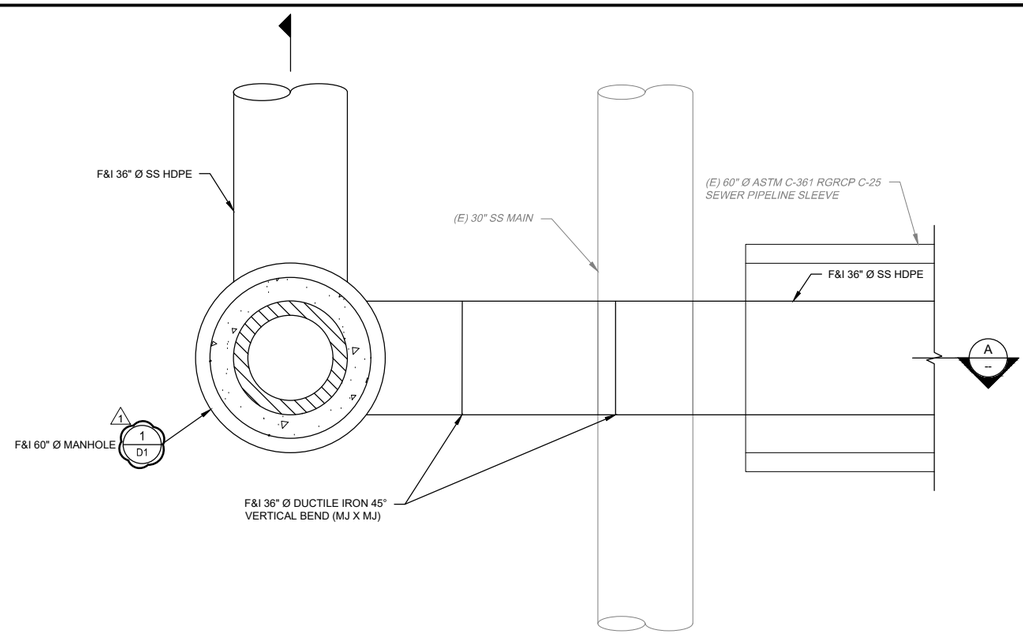


SECTION B

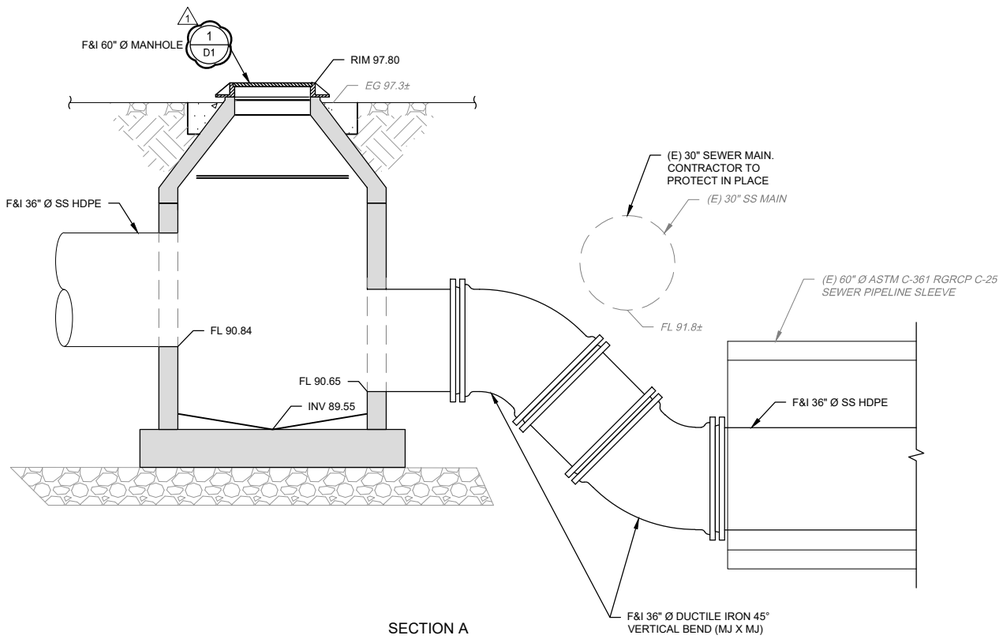
FEET
0 1 2

1
D5

STA 47+58 MANHOLE CONNECTION TO EXISTING



PLAN



SECTION A

FEET
0 1 2

2
D5

STA 49+71 MANHOLE CONNECTION TO EXISTING

100% DESIGN PLANS
FOR BIDDING PURPOSES ONLY
03/05/2025

No.	REVISION	BY	DATE
1	ADDENDA 1	KK	05-14-2025

REGISTERED PROFESSIONAL ENGINEER
KIRK KOESTER
No. 88513
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 03/05/2025

FINAL KILOMETER SEWER TRUNK LINE
REPLACEMENT PROJECT
CITY OF LOS BANOS
IN MERCED COUNTY

DETAILS

DETAILS

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PHONE (209) 826-9696
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www.provostandpritchard.com

DESIGN ENGINEER: KIRK KOESTER
LICENSE NO: RCE 88513
DRAFTED BY: PD, CAJ
CHECKED BY: KK, GMH
DATE: 03/05/2025
JOB NO: 350123011
PROJECT NO: CLB 2023-019
PHASE:

0 1"
ORIGINAL SCALE SHOWN IS ONE INCH. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.

SHEET D5

30 OF 33

3/14/2025 3:25 PM G:\Los Banos_City of-350113501\350123011-Sewer Pipeline Replacement at WWTP\300 CAD\340 Sheet Sets\Sewer Pipeline Replacement\04_Civil_Details\D5 DETAILS.dwg - Ivan Reyes-Chapa

City of Los Banos
Pre-Bid Meeting- Final Kilometer Sewer Trunk Line Project
17963 W. Henry Miller Rd, Los Banos, CA 93635
March 13, 2025 10:00 AM

	Name, Company	Signature	Telephone	Email Address
1.	Charles Bergson, City of Los Banos		209-827-7056	Charles.bergson@losbanos.org
2.	Jelene de Melo, City of Los Banos	Jelene de Melo	209-827-7056	Jelene.demelo@losbanos.org
3.	Jesse Castillo, City of Los Banos	Jesse Castillo	209-827-7052	Jesse.castillo@losbanos.org
4.	Tim Baptista Jr., City of Los Banos		209-827-7056	Tim.baptistajr@losbanos.org
5.	Donna Bond Gretchen Heisdorf, Provost & Pritchard		559-449-2700	gheisdorf@ppeng.com
6.	Charles McElvany	McElvany	2098261102	mcelvanyinc@sbcglobal.net
7.	Mountzin Cascade	Michael Baker	925-373-6370	estimating@mountzincascade.com
8.	MID CAL Pipeline	Joe Faun	209-383-7473	MIDCALPipeline.com
9.	Antonio Bejarano		559 449-2700	abejarano@ppeng.com
10.	Dennis Rolfe		2093585554	mailrolfeconstruction.biz
11.	CHUCK BERGSON	Bergson	[illegible]	cbergson@losbanos.org
12.	Patrick Arambel		209-587-6001	Patrick.arambel@losbanos.org
13.	JEFF GRAHAM		2098966489	Jgraham@mozingoconstruction.com
	Doug Moe RAIN FOR		925-785-3992	doug.moe@isco-pipe.com

City of Los Banos

Pre-Bid Meeting- Final Kilometer Sewer Trunk Line Project

17963 W. Henry Miller Rd, Los Banos, CA 93635

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14.	RAIN FOR RENT	S Z Osborn	8319702424	E.OSBORN@RAINFORRENT.COM
15.	RAIN FOR RENT	JW JONES	(559) 772-5385	jjones@rainforrent.com
16.	KNIFE RIVER	[signature]	209-373-8856	JEFFREY.HERBERT@KNIFERIVER.NET
17.	Teichert	[signature]	559-355-4562	estimating@teichert.com
18.	Teichert	[signature]	(209) 678-5832	
19.	TSCO	Mica Howard	925 315 0103	
20.	HERC BYPASS PUMP	PAT LAZANSKY	(530) 312-3334	PATRICK.LAZANSKY@HERCRENTALS.COM
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23.				
24.				
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