



SAN LUIS OBISPO COUNTY
DEPARTMENT OF PUBLIC WORKS

Paavo Ogren, Director

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May 25, 2012

**FAX AND EMAIL ONLY &
ATTACH TO CONTRACT**

**ADDENDUM NO. 2 TO
LOS OSOS WASTEWATER PROJECT
COLLECTION SYSTEM AREAS B & C
LOS OSOS, CA
CONTRACT NO. 300448.08.01.BC**

**The final day, time and location for submittal of Bid remain unchanged by this
Addendum:**

Date / Time: Thursday, June 7, 2012 at 3:00 p.m.

At: Office of the County Clerk
1055 Monterey Street, Room D-120
San Luis Obispo, California 93408

Certain revisions are hereby incorporated into the Bidding Documents for the subject project.
These revisions are as follows:

The Table of Contents is hereby amended as follows:

- 1) On page ii, under Division 1, General Requirements, immediately after the words "01101 Safety, Health and Emergency Response" insert the following:
01110 Disputes Review Board
- 2) On page v, under Division 15, Mechanical, immediately after the words "15140 Pipe Hangers and Supports" insert the following:
15400 Plumbing – General Provisions
15410 Plumbing – Piping Systems

Division 0, Bidding and Contract Requirements, is hereby amended as follows:

- 1) Replace page 00495-1 with new page 00495-1 attached to this Addendum No. 2.
- 2) On page 00700-25, delete Paragraph 5.04.B.6.a in its entirety and insert the following in its place:
 - a. Such insurance shall remain in effect for five (5) years after final payment.

- 3) On page 00700-26, delete the second to last sentence in Paragraph 5.04.C.1.b in its entirety and insert the following in its place:

Contractor shall maintain and provide Products/Completed Operations coverage to be maintained continuously for a minimum of five (5) years after final payment.

- 4) On page 00700-27, delete the last sentence in Paragraph 5.04.C.1.d in its entirety and insert the following in its place:

Contractor's excess or umbrella liability coverage shall be maintained continuously for a minimum of five (5) years after final payment.

Division 1, General Requirements, is hereby amended as follows:

- 1) On page 01025-2, delete Paragraph 1.07.A in its entirety and insert the following in its place:
 1. Measurement for Payment for PULVERIZED COMPACTED SUBGRADE/PULVERIZED TREATED AND COMPACTED SUBGRADE (PCSG/PTSG) will be by the square yard placed in the Work; which shall be full compensation for all costs incurred to provide pulverization of existing pavement, base, and subgrade materials, removal and disposal of excess pulverized material as required to ensure finish surface of paved roadway matches existing finish surface of roadway, compacting and treating the material prior to paving, and performing conform grinding and conform paving on streets intersecting Pine Street, as directed by the Engineer and as specified and shown in Drawings.
- 2) On page 01050-1, delete Paragraph 1.02.B.1 in its entirety and insert the following in its place:
 1. Provide a certified survey drawn at the same scale as the ENGINEER's line drawings indicating lines, grades, elevations, and stationing at 100-ft increments of gravity sewers where the slope is less than 1%, as shown on the Drawings, and indicating changes in alignment or grade. Provide elevations of structure inverts, pipe invert(s), and rim elevations on all flow structures, excluding laterals.
- 3) On page 01050-2 (Section 01050, Project Controls (Surveying)) delete Paragraph 3.01.E.2 in its entirety and replace with the following:
 2. Copy of all AutoCAD files of documents specified in Article 1.02.B above on a CD or DVD. If requested by the CONTRACTOR, the OWNER will provide an informational electronic copy of AutoCad design drawings for the CONTRACTOR's convenience for preparation of certified survey drawings.

- 4) On page 01060-3, delete Paragraph 1.04.H.5 of Section 01060, Regulatory Agency and Utility Requirements, in its entirety and insert the following in its place:
 5. All diesel construction equipment operated regularly on the Site by the Contractor and Subcontractors shall meet ARB's Tier 3 standard for off-road heavy duty diesel engines.
- 5) On page 01060-3, delete Paragraph 1.04.H.6 of Section 01060, Regulatory Agency and Utility Requirements, in its entirety and insert the following in its place:
 6. All on-road heavy-duty trucks operated regularly on the Site by the Contractor and Subcontractors shall meet ARB's 2007 or newer certification standard for on-road heavy duty diesel engines. This condition would not apply to deliveries and/or hauling to or from the Site by outside material suppliers or trucking companies.
- 6) Insert new Section 01110, Disputes Review Board. (page 01110-1 through 01110-10 attached to this Addendum No. 2)

Division 2, Site Construction, is hereby amended as follows:

- 1) On page 02355-2, delete Paragraph 1.03.G in its entirety and insert the following in its place:
 - G. Qualifications submittals as noted in Paragraph 1.05.A.
- 2) On page 02355-2, delete Paragraph 1.05.A.1 in its entirety and insert the following in its place:
 1. The CONTRACTOR shall submit to the ENGINEER the names and addresses of the owner's representatives, the completion dates and project locations of these constructions.
- 3) On page 02460-1 add the following new paragraph 1.01.F:
 - F. Full depth reclamation shall include a total of 600 square-yards of conform grinding and conform paving at streets intersecting Pine Street, as directed by the Engineer.
- 4) On page 02460-2, delete Paragraph 3.02.D in its entirety and insert the following in its place:
 - D. The surface of the PCSG Material shall be rolled and graded smooth to an elevation that will allow for the original finish surface grades and contours of the existing road surfaces to be maintained after final paving. Material shall provide a firm and unyielding condition. Soft or yielding material shall be removed and replaced with properly compacted material prior to paving. Excess material shall be disposed of offsite by the contractor.

- 5) On page 02460-3, delete Paragraph 3.05.A in its entirety and insert the following in its place:
 - A. Final paving of full depth reclamation and conform segments shall be completed in accordance with Section 02577 – Hot Mix Asphalt Paving
- 6) On pages 02621-3 through 02621-7, delete Paragraph 1.06.E in its entirety and replace with the new Paragraph 1.06.E attached to this Addendum No. 2.
- 7) On page 02605-5 delete Paragraph 2.02.A.8 in its entirety and insert the following in its place:
 8. Exposed interior manhole concrete (not plastic-lined), including manhole shelves, shall be lined with an airless-spray applied elastomeric or aromatic polyurethane (minimum 125 mils DFT) in accordance with manufacturer's recommendations. Polyurethane liner shall be applied by qualified applicators certified by the manufacturer. Polyurethane liner shall be Polybrid 705 by Polybrid Coatings, Brownsville, TX; Utilithane 1600 by Prime Coatings Inc., Tustin, CA; or approved equal.
- 8) Delete Section 02912, Leachfield Effluent Disposal System, in its entirety and insert the new Section 02912 in its place. (page 02912-1 through 02912-8 attached to this Addendum No. 2)

Division 11, Equipment, is hereby amended as follows:

- 1) Delete Section 11258, Odor Control Systems, in its entirety and insert the new Section 11258 in its place. (pages 11258-1 through 11258-6 attached to this Addendum No. 2)

Division 15, Mechanical, is hereby amended as follows:

- 1) Add new Section 15400, Plumbing – General Provisions. (page 15400-1 through 15400-8 attached to this Addendum No. 2)
- 2) Add new Section 15410, Plumbing – Piping Systems. (page 15410-1 through 15410-15 attached to this Addendum No. 2)

Volume 2, Area B Drawings, is hereby amended as follows:

Replace each of the following sheets with the corresponding revised sheet attached to this Addendum No. 2:

B-GC-061	B-GC-064	B-M-003	B-M-004	B-M-005
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Volume 3, Area C Drawings, is hereby amended as follows:

Replace each of the following sheets with the corresponding revised sheet attached to this Addendum No. 2:

C-G-009	C-PP-103	C-PP-361	C-PP-371	C-PP-410
	C-PP-104	C-PP-362	C-PP-373	C-PP-411
C-GC-061	C-PP-107	C-PP-363	C-PP-374	C-PP-412
	C-PP-121	C-PP-365	C-PP-377	C-PP-413
C-C-302	C-PP-142	C-PP-368	C-PP-403	
	C-PP-151	C-PP-369	C-PP-404	C-ED-330
C-M-004	C-PP-360	C-PP-370	C-PP-405	C-ED-337A

All bidders shall acknowledge acceptance of this correction notice. **PLEASE FAX TO US, TODAY, A SIGNED COPY OF THIS SHEET INDICATING CONFIRMATION OF RECEIPT OF THIS ADDENDUM (FAX (805) 781-1229).** If you are unable to read the fax, please call Jeff Werst in the Public Works Department at (805) 781-5252.

For Dave Flynn *JBW*
PAAVO OGREN
Director of Public Works
Enclosures

File: Contract No. 300448.08.01.BC

ACKNOWLEDGMENT

Company Name Printed Name Signature Date

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SECTION 00495

DISADVANTAGED BUSINESS ENTERPRISE
CONTRACTOR SUBCONTRACTOR CERTIFICATION

Firm Name:	Phone:
Address:	
Principal Service or Product:	Bid Amount \$

PLEASE INDICATE PERCENTAGE OF OWNERSHIP BELOW

<input type="checkbox"/> DBE _____% Ownership	
<input type="checkbox"/> Prime Contractor	<input type="checkbox"/> Supplier of Material/Service
<input type="checkbox"/> Subcontractor	
<input type="checkbox"/> Sole Ownership	<input type="checkbox"/> Corporation
<input type="checkbox"/> Partnership	<input type="checkbox"/> Joint Venture
Certified by:	Title:

Name:	
Signature:	Date:

NOTE: Contractors can no longer self-certify. They must be certified by EPA, Small Business Administration (SBA), Department of Transportation (DOT) or by State, Local, Tribal or private entities whose certification criteria match EPA's.

Proof of Certification must be provided. A copy of the contractor certification must be submitted with the Bid.

END OF SECTION

SECTION 01110

DISPUTES REVIEW BOARD

PART 1 GENERAL

1.01 SUMMARY

- A. This Section describes the purpose, procedure, function, and key features of the Disputes Review Board (DRB). Appended to this specification is a Three Party Agreement to be used for formalizing the creation of the DRB.
- B. The DRB will assist and facilitate the timely and equitable resolution of Claims that have been properly referred to the DRB under this Section.
- C. In order for a Claim to be properly referred to the DRB, both the OWNER and the CONTRACTOR must mutually agree in writing to refer that specific Claim to the DRB. Such writing must be signed by both parties. Either the OWNER or the CONTRACTOR can request in writing that the other party mutually agree to refer a Claim to the DRB. If the other party does not respond in writing within 10 days thereafter, the request shall be deemed denied.
- D. Under no circumstances shall the referral of a Claim to the DRB relieve CONTRACTOR from complying with any of the requirements of Paragraph 10.05 of Section 700. In order for such referral to have any effect on CONTRACTORS obligations under Paragraph 10.05, the parties must agree in a separate writing approved as to form by the Office of County Counsel that the referral of the specifically identified Claim referenced therein affects the prospective application of said Paragraph 10.05 to said Claim in a particular manner. Said writing must be expressly approved as to form by the Office of County Counsel on the face of the writing in order for it to be effective.
- E. The DRB shall impartially and promptly consider any Claim referred to it, and shall provide written recommendations to the OWNER and the CONTRACTOR, to assist in the resolution of these disputes.
- F. Although the recommendations of the DRB should carry great weight for both the OWNER and the CONTRACTOR, the recommendations are not binding on either party.

1.02 CONTINUANCE OF WORK DURING DISPUTES

- A. At all times during the course of the dispute resolution process, diligently continue with the Work as directed, without delay, conforming to the OWNER's decision or order, and all applicable provisions of the Contract.

1.03 MEMBERSHIP

- A. General: The DRB will consist of one member selected by the OWNER and approved by the CONTRACTOR, one member selected by the CONTRACTOR and approved by the OWNER, and a third member selected by the first two members and approved by both the OWNER and the CONTRACTOR. The third member shall act as Chairman.

- B. Experience: It is desirable that all Board members be experienced with pipeline construction, interpretation of Contract Documents, and resolution of construction disputes. The goal in selecting the third member is to complement the experience of the first two and to provide leadership for the DRB's activities.
- C. Neutral and Impartial: DRB members shall be neutral, act impartially, and not have any conflict of interest.
- D. Criteria for Membership: For purposes of this Section, the term "member" also includes the member's current primary or full-time employer, and "involved" means having a contractual relationship with the OWNER or CONTRACTOR at any tier. The criteria and limitations for membership are:
 - 1. No member shall have an Ownership interest in any Party involved in the Construction Contract, or a financial interest in the Contract, except for payment for services on the DRB.
 - 2. Except for fee-based consulting services on other projects, no member shall have been previously employed by, or have had financial ties to, any Party involved in the Construction Contract within a period of 30 years prior to award of the Contract. The nature and extent of such fee-based consulting services shall be fully disclosed.
 - 3. No member shall have had a close professional or personal relationship with any key member of any party involved in the Construction Contract which, in the judgment of either party, could suggest partiality.
 - 4. No member shall have had prior involvement in the project, of a nature which could compromise his ability to participate impartially in the DRB's activities.
 - 5. During his tenure on the DRB, no member shall be employed, including fee-based consulting services, by any party involved in the Construction Contract except with the express approval of both parties.
 - 6. During his tenure on the DRB, no member shall engage in a discussion or make an agreement with any party involved in the Construction Contract, regarding employment after the Contract is completed.
 - 7. All members shall be fluent in English, and be able to prepare their recommendations in English.
- E. Availability: Prompt resolution of disputes is a priority. DRB members shall be able to complete their review of information, deliberations, and preparation of recommendations within the timeframes indicated herein. DRB members shall be prepared to comply with these requirements as a condition of their assignment to the DRB.
- F. Disclosure Statement: Before their appointments are final, the first two prospective members shall submit complete disclosure statements for the approval of both the OWNER and the CONTRACTOR. Each statement shall include a resume of experience, together with a declaration describing all past, present and anticipated or planned future relationships, including indirect relationships through the prospective member's primary or full-time employer, to this project and with all parties involved in the Construction Contract. Disclosure of close

professional or personal relationships with all key members of all parties to the Contract shall be included. The third DRB member shall supply such a statement to the first two DRB members and to the OWNER and CONTRACTOR before his or her appointment is final.

- G. Nomination and Approval of First Two Members: The OWNER and the CONTRACTOR shall each nominate a proposed DRB member and convey the nominee's name and reference information to the other party within three weeks after Award of the Contract. If the nominee is not rejected within two weeks after receipt of the name and information, he shall be deemed approved.
- H. Nomination and Approval of Third Member:
 - 1. Immediately after approval, the OWNER and CONTRACTOR will notify their members to begin selection of the third member. The first two members shall ensure that the third member meets all of the criteria listed above. The third member shall be selected within three weeks after the first two members are notified to proceed with his selection.
 - 2. In the event of an impasse in selection of the third member, that member shall be selected by mutual agreement of the OWNER and the CONTRACTOR. In so doing, they may, but are not required to, consider nominees offered by the first two members.
- I. Execution of the Three Party Agreement: The OWNER, the CONTRACTOR, and all three members of the DRB shall execute the Three Party Agreement within four weeks after the selection and approval of the third member.

1.04 OPERATION

- A. General:
 - 1. If OWNER and CONTRACTOR do not provide the DRB with a copy of operating procedures mutually agreed upon, the DRB shall formulate its own operating procedures. It is not desirable to adopt hard and fast rules for the functioning of the DRB. The entire procedure shall be kept flexible to adapt to changing situations. The DRB shall initiate, with the OWNER's and CONTRACTOR's concurrence, new procedures or modifications to old ones, whenever this is deemed appropriate.
 - 2. Neither party shall solicit any DRB member's advice or consultation on matters concerning the conduct of the work.
- B. Visits by DRB: DRB site visits will be scheduled only if the OWNER and the CONTRACTOR mutually agree on the need for visits and then will be scheduled as agreed among the OWNER, the CONTRACTOR, and the DRB.

1.05 PROCEDURE AND SCHEDULE FOR DISPUTE RESOLUTION

- A. Disputes shall be considered as quickly as possible, taking into consideration the particular circumstances and the time required to prepare appropriate documentation. Steps may be omitted, as agreed by both parties, and the time periods stated below may be shortened in order to hasten resolution.

1. When a Claim is submitted to the DRB it shall be heard at a special meeting, as agreed by both Parties. For an urgent matter, the DRB shall meet within two weeks of notification.
 2. During the hearing the CONTRACTOR and the OWNER shall each have ample opportunity to be heard and to offer evidence. Detailed procedures are given in Article 1.6. The DRB's recommendations for resolution of the dispute will be given in writing, to both the OWNER and the CONTRACTOR, within two weeks of completion of the hearings. In difficult or complex cases, and in consideration of the DRB's schedule, this time may be extended by mutual agreement of all parties.
 3. If requested by either party, the DRB shall provide oral or written clarification of its recommendation.
 4. Within two weeks of receiving the DRB's recommendations, or such other time specified by the DRB, both the OWNER and the CONTRACTOR shall respond to the other and to the DRB in writing, signifying either acceptance or rejection of the DRB's recommendations. The failure of either party to respond within the specified period shall be deemed a rejection of the DRB's recommendations. If, with the aid of the DRB's recommendations, the OWNER and the CONTRACTOR are able to resolve their dispute, the OWNER will promptly process any required Contract changes.
 5. Should the Claim remain unresolved, either party may request that the DRB clarify its recommendation or, if new evidence has become available, reconsider its recommendation.
- B. Although both the OWNER and the CONTRACTOR should place great weight on the DRB's recommendations, they are not binding. If the DRB's recommendations do not resolve the Claim, the written recommendations, including any minority report, will be admissible as evidence in any subsequent dispute resolution proceeding.

1.06 CONDUCT OF HEARING

- A. Prehearing Submittals: Written position statements shall be submitted to the other party and each DRB member at least five business days before the hearing begins. The DRB may also request a presentation of factual documentation, prepared jointly by the parties.
- B. Location: Normally the hearing will be conducted at the job site. However, any location that would be more convenient and still provide all required facilities and access to necessary documentation is satisfactory. Private sessions of the DRB may be held at any convenient location.
- C. Proceedings: The third member of the DRB will act as Chairman of the hearing, or he may appoint one of the other members. A formal transcript will not be prepared. In special cases, when requested by either party, the DRB may allow preparation of a transcript by a Court Reporter. Audio or video recordings will not be permitted.
- D. Participants:
 1. The OWNER and the CONTRACTOR shall have representatives at all hearings. The Party requesting DRB review will first present its position, followed by the other party. Each party will then be allowed successive rebuttals until all aspects are fully covered. The DRB members may ask questions, request clarification, or ask for additional data. In difficult or

complex cases, additional hearings may be necessary in order to consider and fully understand all the evidence presented by both parties. Both the OWNER and CONTRACTOR shall be provided full and adequate opportunity to present all of their evidence, documentation and testimony regarding all issues before the DRB.

2. Attendance by, or participation of, lawyers is prohibited.
3. During the hearing, no DRB member shall express any opinion concerning the merit of any facet of the case.

E. DRB Deliberations:

1. After the hearing is concluded, the DRB shall meet to formulate its recommendations. All DRB deliberations shall be conducted in private, with all individual views kept strictly confidential. The DRB's recommendations, together with explanations of its reasoning, shall be submitted as a written report to both parties. The recommendations shall be based on the pertinent provisions of the Contract, applicable laws and regulations, and the facts and circumstances involved in the dispute. It is important for the DRB to clearly and completely express the logic and reasoning leading to the recommendations, so that both parties fully understand it.
2. The DRB shall be permitted to consult with independent legal counsel when deliberating and drafting their decision.
3. The DRB shall make every effort to reach a unanimous recommendation. If this proves impossible, the dissenting member may prepare a minority report.

1.07 COMPENSATION AND LOGISTIC SUPPORT

- A. Fees and expenses of all three members of the DRB shall be shared equally by the OWNER and the CONTRACTOR. The OWNER will provide administrative services, such as conference facilities and secretarial services, and will bear the cost of these services. If the DRB desires special services, such as legal or other consultation, accounting, data research, and the like, both parties must agree, and the costs will be shared by them as mutually agreed.
- B. The CONTRACTOR shall pay the invoices of all DRB members after approval by both parties. The CONTRACTOR will then bill the OWNER for 50 percent of such invoices.

DISPUTE REVIEW BOARD THREE PARTY AGREEMENT
(To Be Executed After the Award of the Construction Contract)

HIS THREE PARTY AGREEMENT (Agreement), made and entered into this _____ day of _____ 20____, between:(OWNER) _____, hereinafter called the "OWNER," and (CONTRACTOR) _____, hereinafter called the "CONTRACTOR", and the Dispute Review Board, hereinafter called the "Board", and consisting of three members, _____.

WITNESSETH, that

WHEREAS, the OWNER is now engaged in the construction of the Los Osos Wastewater Project; and

WHEREAS, the Los Osos Wastewater Project Contract (CONTRACT) provides for the establishment and operation of a Board to assist in resolving disputes, claims and other controversies relating to the Work; and

WHEREAS, the Board is composed of three members, one selected by the OWNER, one selected by the CONTRACTOR, and the third member selected by these two;

NOW THEREFORE, in consideration of the terms, conditions, covenants and agreements contained herein, or attached and incorporated and made a part hereof, the parties hereto agree as follows:

DESCRIPTION OF WORK

In order to assist in the resolution of Claims between the OWNER and the CONTRACTOR, the OWNER has provided, in the Contract, for the establishment of a Dispute Review Board. The intent of the Board is to fairly and impartially consider the disputes referred to it, and to provide written recommendations to the OWNER and CONTRACTOR for resolution of these disputes. The members of this Board shall perform the services necessary to participate on this Board in accordance with the Scope of Work.

The Board is organized to recommend resolution of Claims between the OWNER and the CONTRACTOR that are properly referred to the Board under the Contract Documents, arising from or related to the Construction Contract.

SCOPE OF WORK

The Scope of Work of the Board includes, but is not limited to, the following:

A. Project Site Visits:

The frequency, time, and duration of Project site visits shall be mutually agreed upon among the Board, the OWNER and the CONTRACTOR. In case of failure to agree, the Board shall schedule the visits.

In the case of an actual or potential dispute involving an alleged differing site condition or specific construction problem, it may be advantageous for the Board to personally view any

relevant conditions. If viewing by the Board would cause delay to the project, videos, photographs, and descriptions of these conditions, collected by either or both parties will be utilized.

B. Establish Procedures

The Board shall, with the agreement of all parties, establish procedures for the conduct of its hearings of disputes. The conduct of its business shall, in general, be based on the specification provisions.

C. Recommend Resolution of Disputes

Upon receipt by the Board of a written Request for Review of a Claim signed by both the OWNER and the CONTRACTOR, the Board shall convene a hearing to review and consider the Claim.

It is expressly understood that all Board members are to act impartially and independently in the consideration of facts and conditions surrounding any Claim, and that the recommendations concerning any such Claim are advisory and not binding, unless agreed otherwise by the OWNER and the CONTRACTOR.

The Board recommendations shall be based on the applicable provisions of the Contract Documents, and the facts and circumstances involved in the dispute as conveyed by the testimony and evidence presented by the parties. The recommendations shall be furnished in writing to the OWNER and the CONTRACTOR.

D. Member Replacement

Should the need arise to appoint a replacement Board member, the replacement member shall be appointed in the same manner as the original member was appointed. The selection of a replacement Board member shall begin promptly upon notification of the necessity for a replacement and shall be completed within four weeks. This Agreement will be amended to indicate changes in Board membership.

BOARD RESPONSIBILITIES

The Board members shall become familiar with the Contract Documents necessary to address the Claim before it.

Except for providing the services required in the Agreement, the Board and its individual members shall refrain from giving any advice to either party concerning conduct of the Work or the resolution of problems, which might compromise the Board's integrity.

CONTRACTOR RESPONSIBILITIES

Except for its participation in the Board's activities as provided in the Contract Documents and in this Agreement, the CONTRACTOR shall not solicit advice or consultation from the Board or its members on matters dealing with the conduct of the Work or resolution of problems, which might compromise the Board's integrity.

The CONTRACTOR shall furnish to each Board member one copy of all documents it has, other than those furnished by the OWNER, which are pertinent to the performance of the Board. CONTRACTOR shall concurrently provide the OWNER with any documents provided to the Board.

OWNER RESPONSIBILITIES

Except for its participation in the Board's activities as provided in the Contract Documents and in this Agreement, the OWNER shall not solicit advice or consultation from the Board or its members on matters dealing with the conduct of the Work or resolution of problems, which might compromise the Board's integrity.

The OWNER shall furnish the following:

A. Contract Related Documents

The OWNER shall furnish each Board member one copy of all Contract Documents, including, but not limited to, the Specifications, Drawings, Geotechnical Report, addenda, progress schedule and updates, weekly progress reports, minutes of progress meetings, change orders, and other documents pertinent to the performance of the Contract, and necessary to the Board's work.

B. Coordination

The OWNER will, in cooperation with the CONTRACTOR, coordinate the operations of the Board.

C. Services

The OWNER will arrange for or provide conference facilities at or near the site, and provide secretarial and copying services.

TIME FOR BEGINNING AND COMPLETION

Except for choosing a third member by the first two members, the Board members shall not begin any work under the terms of this Agreement until authorized in writing by the OWNER.

PAYMENT

Invoices of the Board members shall be paid by the CONTRACTOR. Payments shall constitute full compensation for work performed and services rendered, and for all materials, supplies and incidentals necessary to serve on the Board.

A. Payment for Services and Expenses

Payment for services of the OWNER-appointed and CONTRACTOR-appointed members of the Board will be at the rates agreed to between the OWNER and the CONTRACTOR and each respective appointed Board member. Changes in the billing rates are subject to agreement between the OWNER and the CONTRACTOR and their respective appointed members.

Payment for services rendered by the third member of the Board will be paid at the rate agreed to between the OWNER, the CONTRACTOR and the third member. Changes in the billing rate are subject to agreement between the OWNER, the CONTRACTOR and the third member.

The first two members will be reimbursed for the time and expense associated with choosing the third member.

Direct, non-salary expenses will be reimbursed at the actual cost to the Board member. These expenses may include, but are not limited to, automobile mileage, parking, travel expenses from the Board member's point-of-departure to the initial point-of-arrival, automobile rental, food and lodging, printing, long distance telephone, postage and courier delivery. Air travel will be reimbursed for Coach class. Billing for these expenses shall include an itemized listing supported by copies of the original bills, invoices and expense accounts.

B. Payments

Each Board member may submit invoices for payment for work completed not more often than once per month during the progress of Work. Such invoices shall be in a format approved by the OWNER and CONTRACTOR, and accompanied by a general description of activities performed during that period. The value of work accomplished for payment shall be established from the billing rate and hours expended by the Board member together with direct, non-salary expenses. Satisfactorily submitted invoices shall be paid within 30 days.

The CONTRACTOR shall pay the invoices of all Board members after approval of both Parties. The CONTRACTOR will then bill the OWNER for 50 percent of such invoices.

C. Inspection of Cost Records

The cost records and accounts pertaining to this Agreement shall be kept available for inspection by representatives of the OWNER or CONTRACTOR for three years after final payment.

ASSIGNMENT

Board members shall not assign any of the Work of this Agreement.

TERMINATION OF AGREEMENT

This Agreement may be terminated by mutual agreement of the OWNER and the CONTRACTOR at any time upon not less than four weeks written notice to the other parties.

Board members may withdraw from the Board by providing four weeks written notice. Board members may be terminated with or without cause only by their original appointer; the OWNER may only terminate the OWNER-appointed member, the CONTRACTOR may only terminate the CONTRACTOR-appointed member, and the first two members or the OWNER and CONTRACTOR must agree to terminate the third member.

LEGAL RELATIONS

The parties hereto mutually understand and agree that each Board member, in the performance of his duties on the Board, is acting in the capacity of an independent agent and not as an employee of either the OWNER or the CONTRACTOR.

The OWNER and CONTRACTOR expressly acknowledge that each Board member is acting in a capacity intended to facilitate resolution of Claims. Accordingly, it is agreed and acknowledged that to

the fullest extent permitted by law each Board member shall be accorded quasi-judicial immunity for any actions or decisions associated with the consideration, hearing, and recommendation of resolution for disputes rightfully referred to the Board.

Each Board member shall be held harmless for any personal or professional liability arising from or related to Board activities. To the fullest extent permitted by law, the OWNER and CONTRACTOR shall indemnify all Board members for claims, losses, demands, costs and damages (including reasonable attorney fees) for bodily injury, property damage, or economic loss arising out of or related to Board members carrying out Board functions. The foregoing indemnity is a joint and several obligation.

DISPUTES REGARDING THIS THREE PARTY AGREEMENT

Any dispute among the parties hereto, arising out of the Work or other items of this Agreement, which cannot be resolved by negotiation and mutual concurrence between the parties, shall be referred to the Superior Court of the State of California.

VENUE, APPLICABLE LAW, AND PERSONAL JURISDICTION

In the event that any party deems it necessary to institute legal action or proceedings to enforce any right or obligation under this Agreement, the parties hereto agree that any such action shall be initiated in the Superior Court of the State of California. The parties hereby agree that all questions shall be resolved by application of (jurisdiction) California law and that the parties to such action shall have the right to appeal from such decisions of the Superior Court in accordance with the laws of the State of California. The Board member hereby consents to the personal jurisdiction of the Superior Court of the State of California.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

Board MEMBER Board MEMBER Board MEMBER

CONTRACTOR OWNER

By: _____ By: _____

Title: _____ Title: _____

END OF SECTION

- E. Pressure pipes, as specified in Section 02622, shall be used in high groundwater areas for gravity sewer service, as shown in the Table below, and shall use PVC fittings.

Start Stationing	End Stationing	Street	Drawing No.	Pipe Diameter
7+79.94	10+50	3 rd Street	A-PP-100	18
10+88.75	7+57.75	El Moro Avenue	A-PP-101	18
7+57.75	4+24.75	El Moro Avenue	A-PP-101	18
14+11.75	10+88.75	El Moro Avenue	A-PP-102	18
27+33.02	24+10.02	El Moro Avenue	A-PP-102	10
24+10.02	20+76.02	El Moro Avenue	A-PP-102	12
20+76.02	17+44.75	El Moro Avenue	A-PP-102	16
17+44.75	14+11.75	El Moro Avenue	A-PP-102	16
30+67.02	27+33.02	El Moro Avenue	A-PP-103	10
25+12	28+18.16	5th Street	A-PP-107	8
32+50	28+18.16	5th Street	A-PP-108	8
29+50	33+40	6th Street	A-PP-110	8
33+40	34+95.23	6th Street	A-PP-110	8
39+00	34+95.23	6th Street	A-PP-111	8
43+00	39+00	6th Street	A-PP-111	8
39+72	41+75.61	7th Street	A-PP-113	8
37+76	39+72	7th Street	A-PP-114	8
45+75	41+75.61	7th Street	A-PP-115	8
45+75	48+56.04	8th Street	A-PP-118	8
41+74.99	45+75	8th Street	A-PP-119	8
52+50	48+56.04	8th Street	A-PP-120	8
52+00	54+99.46	9th Street	A-PP-124	8
48+20.02	52+00	9th Street	A-PP-125	8
59+00	54+99.46	9th Street	A-PP-126	8
51+93	56+07.62	10th Street	A-PP-131	8
47+92.93	51+93	10th Street	A-PP-132	8
44+65	48+54.51	11th Street	A-PP-133	8
47+16.36	50+37.86	Paso robles Avenue	A-PP-158	8
50+37.86	53+76.76	Paso robles Avenue	A-PP-158	8
43+79.05	47+16.36	Paso robles Avenue	A-PP-159	8
6+60	10+30	18th Street	A-PP-161	8
18+42	14+50	18th Street	A-PP-163	8
42+00	45+71	17th Street	A-PP-165	8
45+71	49+65.98	17th Street	A-PP-165	8
53+50	49+65.98	17th Street	A-PP-167	8
18+30	21+29.49	16th Street	A-PP-168	8
24+00	21+29.49	16th Street	A-PP-169	8
26+00	24+00	16th Street	A-PP-169	8
10+50.01	7+74.59	2nd Street	A-PP-175	8
7+74.59	3+17.40	2nd Street	A-PP-175	12
7+74.59	10+50.01	2nd Street	A-PP-175	8
0+99.91	5+34.78	Santa Maria Avenue	A-PP-184	10
5+34.78	7+21.31	Santa Maria Avenue	A-PP-184	10
7+21.31	10+56.31	Santa Maria Avenue	A-PP-184	10
5+25	7+74.69	1st Street	A-PP-187	8

Start Stationing	End Stationing	Street	Drawing No.	Pipe Diameter
14+58.70	11+49.67	1st Street	A-PP-187	8
11+49.67	7+74.69	1st Street	A-PP-187	8
5+95	3+50	Baywood	A-PP-189	8
3+50	0+98.31	Baywood	A-PP-189	8
17+14.10	13+81.33	Santa Maria Avenue	A-PP-191	8
13+81.33	10+56.33	Santa Maria Avenue	A-PP-191	8
22+04	25+00	4th Street	A-PP-192	8
25+00	28+14.46	4th Street	A-PP-192	8
17+13	21+34.11	3rd Street	A-PP-194	8
15+60	17+13	3rd Street	A-PP-194	8
23+50	21+34.11	3rd Street	A-PP-195	8
0+95.31	03+06.2	Lupine Street	B-PP-101	8
22+17.04	24+31.24	Doris Avenue	B-PP-102	12
24+31.24	26+61.71	Doris Avenue	B-PP-102	12
10+62.44	12+94.02	Binscarth Road	B-PP-103	12
8+23.20	10+62.44	Binscarth Road	B-PP-104	12
5+74.42	8+23.20	Binscarth Road	B-PP-104	12
1+06.06	5+74.42	Binscarth Road	B-PP-104	12
19+75.06	22+14.71	Pecho Road	B-PP-105	12
17+23	19+75.06	Pecho Road	B-PP-105	12
14+10	17+23	Pecho Road	B-PP-105	10
3+12.19	1+06.57	Lupine Street	B-PP-107	8
5+40.59	3+12.19	Lupine Street	B-PP-107	8
3+19.04	1+05.94	Bay Street	B-PP-108	10
6+62.19	3+19.04	Bay Street	B-PP-108	10
3+60	0+94	Ramona Avenue	B-PP-109	8
6+15.58	3+60	Ramona Avenue	B-PP-109	8
7+50	6+15.58	Ramona Avenue	B-PP-109	8
12+00	15+13.17	Donna Avenue	B-PP-110	8
11+20	15+10.65	Fearn Avenue	B-PP-111	8
15+67.55	15+10.65	Fearn Avenue	B-PP-111	8
16+03.64	13+38.30	Mitchell Drive	B-PP-112	8
17+60	16+03.64	Mitchell Drive	B-PP-112	8
11+90	13+38.30	Mitchell Avenue	B-PP-112	8
6+66.83	9+41.72	Don Avenue	B-PP-113	8
30+62.32	33+08.37	Pine Avenue	B-PP-115	8
25+34.98	23+09.12	Broderson Avenue	B-PP-117	8
27+40.40	26+61.71	Doris Avenue	B-PP-118	12
27+90.70	27+40.40	Doris Avenue	B-PP-118	8
29+49.59	27+90.70	Doris Avenue	B-PP-118	8
30+35.24	29+49.59	Doris Avenue	B-PP-118	8
15+45.88	12+94.02	Binscarth Road	B-PP-120	8
17+73.62	15+45.88	Binscarth Road	B-PP-120	8
20+25.78	17+73.62	Binscarth Road	B-PP-120	8
8+29.31	10+73.32	Donna Avenue	B-PP-125	8
5+81.73	8+29.31	Donna Avenue	B-PP-125	8
8+25.16	10+70.99	Fearn Avenue	B-PP-128	8
5+79.28	8+25.16	Fearn Avenue	B-PP-128	8
3+55	5+85.95	Don Avenue	B-PP-132	8

Start Stationing	End Stationing	Street	Drawing No.	Pipe Diameter
19+09.72	22+17.04	Doris Avenue	B-PP-140	8
17+07.46	19+09.72	Doris Avenue	B-PP-140	8
3+30	0+74.53	Garden Street	B-PP-141	8
13+08.95	10+68.94	Nancy Avenue	B-PP-142	8
0+92.97	5+00.61	Sunny Hill Road	B-PP-144	8
6+69.99	8+45.94	Henrietta Avenue	B-PP-145	8
1+03.90	4+94.15	Maple Avenue	B-PP-146	8
6+58.37	10+68.94	Nancy Avenue	B-PP-148	8
4+27.34	6+58.37	Nancy Avenue	B-PP-148	8
3+15	1+05.97	Grove Street	B-PP-151	8
5+30	3+15	Grove Street	B-PP-151	8
3+33.90	1+05.93	Henrietta Avenue	B-PP-152	8
5+07.24	3+33.90	Henrietta Avenue	B-PP-152	8
7+81.91	7+20.29	Solano Street	B-PP-154	8
0+92.68	3+52.89	Nevada Court	B-PP-157	8
9+55.54	10+43.37	Butte Drive	B-PP-158	8
6+14.36	9+55.54	Butte Drive	B-PP-158	8
2+45.45	6+14.36	Butte Drive	B-PP-158	8
61+30.27	Mid-Town Wetwell	Los Osos Valley Road	C-PP-102	18
61+30.27	60+23.36	Los Osos Valley Road	C-PP-102	16
63+20	61+30.27	Los Osos Valley Road	C-PP-102	16
66+26.53	63+20	Los Osos Valley Road	C-PP-102	16
70+43.21	66+26.53	Los Osos Valley Road	C-PP-102	16
72+60	70+43.21	Los Osos Valley Road	C-PP-103	16
74+47	72+60	Los Osos Valley Road	C-PP-103	16
74+75.63	74+47	Los Osos Valley Road	C-PP-103	16
76+89.07	74+75.63	Los Osos Valley Road	C-PP-103	16
80+08	76+89.07	Los Osos Valley Road	C-PP-104	16
80+97.37	80+08	Los Osos Valley Road	C-PP-104	16
83+31.78	80+97.37	Los Osos Valley Road	C-PP-104	12
84+20	83+31.78	Los Osos Valley Road	C-PP-104	12
85+98	84+20	Los Osos Valley Road	C-PP-104	12
86+94	85+98	Los Osos Valley Road	C-PP-104	12
90+04.35	86+94	Los Osos Valley Road	C-PP-104	10
91+25	90+04.35	Los Osos Valley Road	C-PP-105	10
93+42	91+25	Los Osos Valley Road	C-PP-105	8
95+53	93+42	Los Osos Valley Road	C-PP-105	8
96+97	95+53	Los Osos Valley Road	C-PP-105	8
97+11	96+97	Los Osos Valley Road	C-PP-105	8
98+56	97+11	Los Osos Valley Road	C-PP-105	8
101+18	98+56	Los Osos Valley Road	C-PP-105	8
103+95.18	101+18	Los Osos Valley Road	C-PP-106	8
104+34.73	103+95.18	Los Osos Valley Road	C-PP-106	8
108+15.11	104+34.73	Los Osos Valley Road	C-PP-106	8
1+55	1+11.9	Bush Drive	C-PP-129	8
4+45	1+55	Bush Drive	C-PP-129	8
3+92	3+61.78	Ferrel Avenue	C-PP-130	8
6+31	3+92	Ferrel Avenue	C-PP-130	8
1+00	0+47.44	9th Street	C-PP-131	16

Start Stationing	End Stationing	Street	Drawing No.	Pipe Diameter
3+06	1+00	9th Street	C-PP-131	16
6+49	3+06	9th Street	C-PP-131	16
7+39.05	6+49	9th Street	C-PP-131	16
11+83.69	12+23.69	Bayview Heights Drive	C-PP-132	8
10+52	11+83.69	Bayview Heights Drive	C-PP-132	8
6+97.2	10+52	Bayview Heights Drive	C-PP-132	8
11+71	10+10.61	Bay Oaks Drive	C-PP-133	8
12+56.95	11+71	Bay Oaks Drive	C-PP-133	8
1+65	0+90.83	10th Street	C-PP-139	8
4+06	1+65	10th Street	C-PP-139	8
6+40	6+89.92	Sunset Drive	C-PP-140	8
3+90	6+40	Sunset Drive	C-PP-140	8
1+89	3+90	Sunset Drive	C-PP-140	8
4+22.64	4+49.89	Paso Robles Avenue	D-PP-100	18
4+29.88	7+79.38	3rd Street	D-PP-101	18
1+68.51	4+29.88	3rd Street	D-PP-101	18
4+28.81	1+93.33	Pismo Avenue	D-PP-102	18
1+93.33	1+04.16	Pismo Avenue	D-PP-102	18
7+91.19	4+68.72	4th Street	D-PP-103	16
4+68.72	1+69.23	4th Street	D-PP-103	14
7+52.67	10+52.67	11th Street	D-PP-110	12
4+52.67	7+52.67	11th Street	D-PP-110	12
1+10.35	4+52.67	11th Street	D-PP-111	12
10+59.55	7+66.68	Los Olivos Avenue	D-PP-112	10
12+55.99	10+59.55	Los Olivos Avenue	D-PP-112	10
7+64.46	4+28.81	Pismo Avenue	D-PP-114	14
10+89.68	7+64.46	Pismo Avenue	D-PP-114	14
14+07.85	10+89.68	Pismo Avenue	D-PP-114	14
14+07.85	17+42.99	Pismo Avenue	D-PP-115	14
35+03.66	31+12.20	Pismo Avenue	D-PP-116	14
15+26.2	18+33.47	10th Street	D-PP-134	8
11+89.22	15+26.2	10th Street	D-PP-135	8
9+25.94	11+89.22	10th Street	D-PP-135	8
5+68.81	8+43	Fairchild Way	D-PP-139	8
8+43	9+84.46	Fairchild Way	D-PP-139	8
10+18.25	7+91.22	4th Street	D-PP-144	8
26+11.11	28+11.68	11th Street	D-PP-158	8
9+45.58	10+94.16	Santa Ynez Avenue	D-PP-172A	8
1+20.07	5+19.12	12th Street	D-PP-174	8
21+13.03	17+53.28	Santa Ynez Avenue	D-PP-175	8
24+03.04	21+13.03	Santa Ynez Avenue	D-PP-175	8
15+42.68	17+03.44	Fairchild Way	D-PP-176	8
13+81.7	15+42.68	Fairchild Way	D-PP-176	8
7+14.56	8+52.10	Mountain View Avenue	D-PP-180	8
8+52.10	11+86.27	Mountain View Avenue	D-PP-180	8
5+17.99	7+14.56	Mountain View Avenue	D-PP-181	8
2+21.84	5+17.99	Mountain View Avenue	D-PP-181	8
27+70.72	29+81.92	Santa Ynez Avenue	D-PP-182	8
25+70.86	27+70.72	Santa Ynez Avenue	D-PP-182	8

Start Stationing	End Stationing	Street	Drawing No.	Pipe Diameter
29+81.92	30+69.45	Santa Ynez Avenue	D-PP-182	8
30+69.45	31+32.77	Santa Ynez Avenue	D-PP-182	8
31+32.77	34+01.29	Santa Ynez Avenue	D-PP-182	8
24+41.06	27+56.97	Los Olivos Avenue	D-PP-183	8

SECTION 02912

LEACHFIELD EFFLUENT DISPOSAL SYSTEM

PART 1 GENERAL

1.01 THE REQUIREMENT

- A. The CONTRACTOR shall provide the Broderson Leachfield Effluent Disposal System comprising pressure-dosed leaching chambers, complete and in place, in accordance with the Contract Documents.
- B. This Section includes high density polyethylene leaching chambers (adsorption field chambers) and solid and perforated PVC pressure pipe with solvent-welded, flanged, or screwed joints.
- C. The Broderson Leachfield Effluent Disposal System shall have a capacity of 1,600,000 gallons per day.

1.02 RELATED WORK

- A. Contractor Submittals are included in Section 01300.
- B. Pipeline testing and cleaning water lines is included in Section 01445.
- C. Earthwork is included in Section 02200.
- D. Trenching, backfilling and compacting is included in Section 02221.
- E. Pavement repair and resurfacing are included in Section 02576.
- F. Precast concrete structures are included in Section 02605.
- G. Ductile iron fittings are included in Section 02616.
- H. Small Diameter PVC Pressure Pipe Section 02624.
- I. Valves and appurtenances are included in Division 15.
- J. Revegetation is included in Section 02930.

1.03 SUBMITTALS

- A. All Submittals shall be in accordance with Section 01300 – Contractor Submittals.
- B. Submit within 30 days of the Effective Date of the Agreement, the name of the pipe and fitting manufacturers and a list of materials to be furnished by each manufacturer. Also, include information on local representative for each manufacturer, if product is sold through a distributor.

- B. Submit Shop Drawings including piping layouts and schedules shall include dimensioning, fittings, types and locations of valves and appurtenances, joint details, methods and location of supports, anchorage, gasket material, grade of material and all other pertinent technical information for all items to be furnished.
- C. Prior to each shipment of pipe, submit certified test reports that the pipe for this Contract was manufactured and tested in accordance with the ASTM and AWWA Standards specified herein shall be submitted.
- D. Submit complete description of method of pipe installation.
- E. Submit the manufacturer's recommendations for handling, storing and installing the pipe and fittings.
- F. Submit ISO certification or material testing requirements. Material testing requirements to be submitted:
 - 1. A third party materials testing laboratory shall be contracted.
 - 2. 3 random samples from sales distribution locations shall be obtained without manufacturer notification.
 - 3. Product samples shall be test for: Tensile Flexural Modulus ASTM D790, Tensile Yield Strength ASTM D638, Environmental Stress Crack Resistance D1693, and Izod Impact ASTM D256.
 - 4. Materials testing lab shall contact the manufacturer and obtain the minimum property specifications.
 - 5. The materials testing laboratory shall prepare a report comparing the testing results to the minimum specifications.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - 2. ASTM D1785 – Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120
 - 3. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
 - 4. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
 - 5. ASTM F 1498 – Standard Specification for Taper Pipe Threads 60 Degrees for Thermoplastic Pipe and Fittings

6. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- B. American Water Works Association (AWWA)
 1. AWWA M-23 – Manual of Water Supply Practices PVC Pipe, Design and Installation.
- C. National Sanitation Foundation (NSF)
 1. Standard No. 14 - Plastic Piping Components and Related Materials.
- D. American National Standards Institute
 1. ANSI/ASME B 16.5 – Pipe Flanges and Flanged Fittings, Class 150
- E. International Association of Plumbing and Mechanical Officials
 1. IAPMO PS 63 – Plastic Leaching Chambers.
- F. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. All small diameter PVC pipe shall be from a single manufacturer. The supplier shall be responsible for the provisions of all test requirements specified in ASTM D3034 and NSF Standard No. 14 as applicable. In addition, all PVC pipe to be installed under this Contract may be inspected at the plant for compliance with this Section by an independent testing laboratory provided by the OWNER. The CONTRACTOR shall require the manufacturer's cooperation in these inspections. The cost of plant inspection of all pipe approved for this Contract, plus the cost of inspection of a reasonable amount of disapproved pipe, will be borne by the OWNER.
- B. Inspections of the pipe may also be made by the ENGINEER or other representatives of the OWNER after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the requirements specified herein, even though sample pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job at once.
- C. Chamber manufacturing facility shall be ISO certified to the latest requirements. Proof of certification shall be required as part of the submittals.
- D. If the plant is not ISO certified then the contractor shall submit material testing as defined in the submittals.

1.06 DELIVERY, STORAGE AND HANDLING

- A. All items shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the ENGINEER.

- B. PVC items deteriorate in sunlight and are slightly brittle, especially at lower temperatures, so care shall be taken in loading, transporting and unloading items to prevent injury to the items. All items shall be examined before installation and no piece shall be installed which is found to be defective. Handling and installation of pipe and fittings shall be in accordance with the manufacturer's instructions, referenced standards and as specified herein.
- C. Any pipe or fitting showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture can be seen, shall be marked as rejected and removed immediately from the job.
- D. Any gouges or scratches that extend 10 percent or more into the pipe wall shall be cause for rejection of that pipe. The undamaged portion may be cut off and used. Rejected materials shall be clearly marked as rejected, segregated and removed from the site.
- E. While stored, pipe shall be adequately supported from below at not more than 3-ft intervals to prevent deformation. The pipe shall be stored in stacks no higher than 5 rows.
- F. Pipe and fittings shall be stored in a manner which will keep them at ambient outdoor temperatures and out of the sunlight. Temporary shading as required to meet this requirement shall be provided. Simple covering of the pipe and fittings which allows temperature buildup or direct or indirect sunlight will not be permitted.
- G. If any defective item is discovered after it has been installed, it shall be removed and replaced with an exact replacement item in a satisfactory manner by the CONTRACTOR, at the CONTRACTOR's own expense. All pipe and fittings shall be thoroughly cleaned before installation and the interior shall be kept clean until testing
- H. In handling the items, use special devices and methods as required to achieve the results specified herein. No uncushioned devices shall be used in handling the item.
- I. Do not deliver chambers to job site earlier than one week prior to scheduled date of commencing installation.
- J. All storage and handling of the chambers at job site shall not in any way impair or damage the product.

PART 2 PRODUCTS

2.01 LEACHING CHAMBER

- A. The leaching chambers are also referred to as absorption chambers..
- B. The chambers shall be manufactured of polypropylene by an injection molding process. If the chambers are to be manufactured via other methods, then Environmental Stress Crack Resistance testing is required with the submittals.
- C. The chambers shall be arch shaped and of open bottom construction with provisions for side exit of effluent. Side exit openings shall be louvered so as not to allow entry of backfill materials into the chamber. The sidewall louver height shall be no less than 11.0 inches. The use of filter fabric or stone to achieve this provision is allowed, but not required..

- D. The chambers shall achieve an axle loading of 16,000 lbs/axle (AASHTO rating of H-10) with 12" of compacted backfill, and installed according to manufacturer's specifications.
- E. The chamber shall be injection molded in units not exceeding 4.5 feet in length, by 2.83 feet in width, by 16.0 (+/-) inches in height. When interlocked the effective length shall be 4 feet. If the chamber is not 4 feet in length then the contractor may be required to cut the chambers to meet the required trench length per the plans. The chamber shall allow for pressure or gravity distribution.
- F. The chamber endplates shall accommodate many invert heights and come with a premolded splash pad to prevent trench erosion. If there is no splash pad provided then the contractor shall provide other means for trench erosion protection such as concrete patio blocks or other method to be approved by the design engineer.
- G. Individual units shall be constructed in a manner that allows interlocking from one to the next. Each joint shall allow a minimum deflection of 10 degrees.
- H. Chambers shall have interior drip ledges to prevent pressure dosed effluent from traveling down the inside louver walls, thereby preventing fill from entering the chamber. If the chamber does not have a drip ledge then orifice shields shall be required.
- I. Manufacturer or Equal
 - 1. Advance Drainage Systems, Inc.
 - 2. Infiltrator Systems, Inc.

2.02 GEOTEXTILE FABRIC

- A. Chambers shall be covered with geotextile fabric. Geotextile fabric shall comply with Section 02200.2.03C.13.

2.03 PIPE MATERIAL

- A. PVC pipe shall be made from all new rigid unplasticized polyvinyl chloride complying with Section 02624. Pipe shall be alternating 10-foot long sections of solid wall pressure pipe and 10-foot long sections of perforated pipe. Perforated pipe shall have two ½-inch diameter holes drilled at 5-inch on center 120 degrees apart at 10 and 2 o'clock positions.

2.04 PIPE JOINTS

- A. Pipe joints shall be solvent-welded type with solvent cement and primer as recommended by the pipe manufacturer for the chemical in the pipe and in accordance with ASTM D2564 – Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
- B. Screwed joints that are necessary to match up to threaded valves or fittings shall be made up with appropriate thread sealant, either paste or tape.
- C. Flanged joints shall be made with solvent-welded PVC flanges, drilled to ANSI/ASME B 16.5 – Pipe Flanges and Flanged Fittings, Class 150, unless otherwise indicated. Gaskets shall be

ANSI 150 lb. full face, 1/8-inch thick Neoprene for water or wastewater service. Gasket material for chemicals shall be suitable for the chemical service.

2.05 FITTINGS

- A. Solvent Welded and Threaded Fittings: Solvent-welded and threaded fittings shall be Schedule 80 PVC fittings in accordance with ASTM D 2467 – Standard Specifications for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- B. Flanged Fittings: Flanged fittings shall be Schedule 80 fabricated PVC fittings with 150 lb. flanges to ANSI/ASME B 16.5.

2.06 BEDDING AND BACKFILL

- A. Chamber backfill and pipe bedding and backfill shall be Type I native backfill in accordance with Section 02200 – Earthwork.

2.07 FLOW CONTROL VAULTS

- A. Precast Vaults: Precast vaults shall comply with Section 02605.
- B. Pipe Penetration Seals: Vault wall penetration seals shall comply with Section 15100.
- C. Solvent Welded and Threaded Fittings: Solvent-welded and threaded fittings shall be Schedule 80 PVC fittings in accordance with ASTM D 2467 – Standard Specifications for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 complying with Section 02624.
- D. Flanged Fittings: Flanged fittings shall be ductile iron fittings with 150 lb. flanges conforming to Section 02616.
- E. Isolation Valves: Gate valves shall comply with Section 15100.
- F. Flow Control Valves: Solenoid flow control valves shall comply with Section 15100.
- G. Pipe Supports: Isolation Valves: Gate valves shall comply with Section 15100.
- H. Sleeve Coupling: Sleeve couplings shall comply with Section 15100.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install chambers, pipe, pipe fittings, accessories, and bedding materials in strict accordance with plans and instructions by the manufacturer.
 - 1. Excavate trenches to proper width, and proper depth.
 - 2. Smooth irregularities in the excavation. A level, flat surface is required in the bottom of the trench prior to setting the assembled chambers.
 - 3. Assemble the pressure (alternating sections of solid wall and perforated) piping.

4. Assemble leaching chambers and universal endplates together in the trenches.
 5. Punch out pipe hole opening in the end plates as needed and connect inlet pipes and observation ports.
 6. Cover the leaching chambers and pressure piping with geotextile fabric.
 7. Fill sidewall area to top chambers with select native soil or coarse sand or fine gravel.
 8. Cover leaching chambers to a minimum of 18 inches with granular soil cover after consolidation.
 9. Compact backfill to 85% relative compaction.
- B. Pipe General: PVC pipe shall be installed in a neat and workmanlike manner, properly aligned, and cut from measurements taken at the Site to avoid interferences with structural members, architectural features, openings, and equipment. Exposed pipe shall afford maximum headroom and access to equipment, and where necessary, piping shall be installed with sufficient slopes for venting or drainage of liquids and condensate to low points. It is recommended that the CONTRACTOR obtain the assistance of the pipe manufacturer's field representative to instruct the pipefitters in the correct installation and support of PVC piping.
- C. Supports and anchors: Piping shall be firmly supported with fabricated or commercial hangers or supports in accordance with Section 15140 – Pipe Hangers and Supports. Where necessary to avoid stress on equipment or structural members, the pipe shall be anchored or harnessed. Expansion joints and guides shall compensate for pipe expansion due to temperature changes.
- D. Valve and Unions: Unless otherwise indicated, connections to fixtures, groups of fixtures, and equipment shall be provided with a shutoff valve and union, unless the valve has flanged ends. Unions shall be provided at threaded valves, equipment, and other devices requiring occasional removal or disconnection. Valves and flanges attached to PVC pipe shall be provided with adequate supports.

3.02 PIPE PREPARATION

- A. Prior to installation, each pipe length shall be carefully inspected, flushed clean of any debris or dust, and be straightened, if not true. Ends of threaded pipes shall be reamed and filed smooth. Pipe fittings shall be equally cleaned before assembly.

3.03 PIPE JOINTS

- A. Threaded Joints: Pipe threads shall conform to ASTM F 1498 – Standard Specification for Taper Pipe Threads 60 Degrees for Thermoplastic Pipe and Fittings, and shall be full and cleanly cut with sharp dies or molded. Joints shall be made with Teflon tape or thread sealant.
- B. Solvent-Welded Joints: Solvent-welded joints shall be made with fresh primer and solvent cement on clean, dry pipe ends. The primer and cement cans shall be kept closed at all times and the joints shall be made up at the recommended ambient temperatures, to the pipe or cement manufacturer's written recommendations. Pipe ends shall be inserted to the full depth of the socket.

- C. Flange Joints: Flanged joints shall be made with gaskets and Type 316 stainless steel bolts and nuts. Care shall be taken not to over-torque the bolts, in accordance with the manufacturer's written recommendations.

3.04 INSPECTION AND FIELD TESTING

- A. Inspection: Finished installations shall be carefully inspected for proper joints and sufficient supports, anchoring, interferences, and damage to pipe, fittings, and coating. Damage shall be repaired to the satisfaction of the ENGINEER.
- B. Field Testing: The CONTRACTOR shall allow adequate time for the solvent cement joints to cure. Curing time shall be per the solvent cement manufacturer's recommendation. Prior to enclosure or burying, piping systems shall be pressure tested as required in the Piping Schedule and in accordance with Section 01445, for a period of not less than two hours, without exceeding the tolerances listed in the Piping Schedule. Caution – Do not use air or gas for testing PVC pipe. Where no pressures are indicated, the pipes shall be subject to 1-1/2 times the maximum working pressure. The CONTRACTOR shall furnish all test equipment, labor, materials, and devices.
- C. Leakage shall be determined by loss of pressure. Fixtures, devices, or other accessories that would be damaged if subjected to the test pressure shall be disconnected and ends of the branch lines shall be plugged or capped as appropriate during the testing procedures.
- D. Leaks shall be repaired to the satisfaction of the ENGINEER, and the system shall be retested until no leaks are found.

END OF SECTION

SECTION 11258
ODOR CONTROL SYSTEMS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install the activated carbon adsorption odor control system, including all connection ductwork, vessel, fan (if required), grease filter/mist eliminator and incidentals, as shown on the Drawings and as specified herein.
 - 1. Three passive carbon adsorption systems shall be provided on the two air release valve locations for the Mid-Town force main system as shown on the Drawings. Each system consists of two vessels.

1.02 RELATED WORK

- A. PVC pipe is included in Division 2.
- B. Concrete work is included in Division 3.

1.03 SUBMITTALS

- A. Submit to the ENGINEER, in accordance with Section 01300, shop drawings and schedules. Submittals shall include the following:
 - 1. Certified shop drawings showing all details of equipment and dimensions.
 - 2. Descriptive literature, bulletins and/or catalogs of equipment including the last five installations of similar equipment.
 - 3. All information required by Section 01300.
 - 4. The weight of each major item of equipment.
 - 5. A complete total bill of materials for equipment.
 - 6. A list of the manufacturer's recommended spare parts. Include gaskets, seals, etc, on the list.
 - 7. Complete data on the head loss for the air flow through the vessel at the design air flow rate and at the maximum head loss prior to carbon change-out.

8. Complete data on the activated carbon showing it to be in conformance with this Section. Include a complete analysis of the capacity of the activated carbon to adsorb hydrogen sulfide and expected life of the carbon (months) based on anticipated inlet conditions.
 9. Data on equipment noise as specified in Section 01060.
- B. In the event that it is impossible to conform with certain details of this Section, describe completely all non-conforming aspects.
- C. Operation and Maintenance Data
1. Operating and maintenance instructions shall be furnished to the ENGINEER as provided in Section 01730. The instructions shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc, that are required to instruct operating personnel that are unfamiliar with such equipment.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
1. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
- B. Occupational Safety and Health Administration (OSHA)
- C. National Electrical Manufacturers Association (NEMA)
- D. National Electrical Code (NEC)
- E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. All carbon adsorption equipment specified in this Section shall be furnished by a single manufacturer who is fully experienced reputable and qualified in the design, construction and operation of odor control systems incorporating activated carbon. Provide evidence of successful operation of such units in commercial application for a period of at least five years.
- B. The manufacturer shall furnish certified test results indicating H₂S adsorption capacity in pounds per pound of dry carbon for the carbon actually furnished.
- C. Should equipment which differs from this Section or as shown on the Drawings be offered and determined equal to that specified and shown, such equipment shall be acceptable only on the basis that any revisions to the design and/or construction of the structure, piping, appurtenant equipment, etc, required to accommodate such a substitution shall be made at no additional cost to the OWNER and be as approved by the ENGINEER.
- D. Provide services of a manufacturer's service representative, as required in Section 01730, specifically trained on the type of equipment specified in this Section. Submit qualifications of

service representative for approval. The number of required days listed below are exclusive of travel time, and do not relieve the Subcontractor of obligation to provide sufficient service to place equipment in satisfactory operation.

1. Operation and maintenance instructions. One 8-hour day

1.06 SYSTEM DESCRIPTION

- A. Passive carbon adsorption systems shall be installed on major air release valves (ARVs) as shown on the Drawings. Air shall be pushed through each carbon vessel with carbon media and discharged to the atmosphere. Two carbon vessels with carbon shall be provided as shown on the Drawings.
- B. The carbon vessel(s) shall have the capability of operating under the following conditions:
 1. Maximum Design Capacity: 400 cfm with 20 ppm hydrogen sulfide,
 2. Average Design Capacity: 400 cfm with 5 ppm hydrogen sulfide,
- C. The carbon shall be suitable for continually removing concentrations of hydrogen sulfide and organic compounds resulting from raw wastewater containing nitrogen and sulfur compounds such as mercaptans, indole, skatole and organic acids.
- D. The carbon odor control system shall have an H₂S removal efficiency of 99% and a maximum outlet odor concentration of 100 D/T.
- E. All equipment furnished under this Section shall conform to the noise limitations specified in Section 01060.

1.07 MAINTENANCE

- A. Tools and Spare Parts
 1. One set of all special tools required for normal operation and maintenance shall be provided.
 2. One complete supply of replacement carbon.
 3. All tools and spare parts shall be packaged and labeled as provided in Section 01170.

1.08 WARRANTY

- A. Upon completion of installation and start-up of the equipment specified herein and acceptance by ENGINEER, provide Manufacture/Supplier warranty in accordance with Section 01740, Warranties and Bonds.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Carbon Vessels

1. The carbon system manufacturer shall be responsible for furnishing a complete operational system including the carbon vessel, carbon, and accessories. The carbon adsorption vessels shall include inlet and outlet flanged openings, sufficient activated carbon to fill the vessels and access ports to remove and replace the carbon. The system shall be under positive pressure with an ARV pushing air through the vessel and discharging to the atmosphere.
2. Vessels shall be fire retardant, chemically resistant to corrosive fumes, acidic and basic solutions, and ultraviolet degradation.
3. Vessels color shall be white or ENGINEER approved color.
4. Vessels shall be constructed of corrosion resistant FRP or equal. Alternate materials of construction shall be submitted to the ENGINEER prior to approval for review.
6. Carbon vessel manufacturer shall provide connection ductwork between mist eliminator/grease filter to the carbon vessel.
7. Carbon vessels shall be supplied with a single drain and ball valve.

B. Activated Carbon

1. Sufficient activated carbon shall be provided to fill the vessels as required. The activated carbon shall be virgin granular activated carbon. The activated carbon shall be suitable for the vapor phase adsorption of sewage treatment odors. No chemical impregnation of the activated carbon is permitted. The activated carbon shall have the following specifications:
 - a. Moisture, weight % 5 max
 - b. Hardness No. 90 min
 - c. Apparent Density, g/ml 0.4 to 0.5 min
 - d. Mean Particle Diameter, mm 3.7 min
 - e. H₂S Breakthrough Capacity, g H₂S removed/cc Carbon* 0.20 min

* The determination of H₂S breakthrough capacity will be made by passing a moist (85% R.H.) air stream containing 1% H₂S at a rate of 1,450 cc/min. through a 1-in diameter by 9-in deep bed of uniformly packed activated carbon and monitored to 50 ppm breakthrough. Results are expressed in grams H₂S removed per cc of carbon.

The carbon supplied shall be of a type that does not require chemicals to be regenerated in-place. Carbons which require hydroxide, permanganate, chlorine, organic, or other solutions, to regenerate the material, will not be accepted.

C. Grease Filter/Mist Eliminator

1. A grease filter/mist eliminator shall be supplied. This unit shall consist of a Type 304L stainless steel pad for grease filtration in front of a PPL pad with Type 316 stainless steel grid for mist elimination, housed inside an FRP enclosure. The pads shall be removable for cleaning and the housing shall have two doors, to allow removal and replacement of the filter pads.

2. A Dwyer Series 2000 Magnehelic gauge shall be installed on the housing to indicate pressure drop through the unit. This unit shall ship loose and be ready for installation into the odor control system supply ductwork.
3. Grease filter/mist eliminator shall be provided with a drain and ball valve.
4. The FRP housing shall be flanged and drilled per PS 15-69 and come complete with gaskets, ready for installation. The filter/eliminator unit shall be manufactured by Diamond Fiberglass Fabricators, Inc.; Kimre Inc., Miami, FL; Ceilcote Air Pollution Control, Strongsville, OH or equal.
5. Location of the grease filter/mist eliminator shall be coordinated with the carbon system Manufacturer and the ductwork Manufacturer. Location shall be approved by the ENGINEER prior to fabrication and installation.

D. All metal surfaces shall be factory finish painted with a corrosion resistant paint.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Installation shall be in strict accordance with the manufacturer's instructions and recommendations in the location as shown on the Drawings.

3.02 INSPECTION AND TESTING

- A. Furnish the services of a manufacturer's representative who has complete knowledge of proper installation, operation, and maintenance of the equipment to inspect the final installation, supervise test runs of the equipment and instruct representatives of the OWNER in the proper operation and maintenance.
- B. Installation of the carbon bed support systems and activated carbon shall be done under the direction of the manufacturer's representative in order to assure proper placement of the activated carbon. The manufacturer's representative shall instruct personnel in the proper safety precautions concerning handling of activated carbon.
- C. Once the system installation has been approved by the manufacturer and the ENGINEER, it shall be run for 24 hours and all necessary adjustments shall be made to air flow rate (if required), alignment and calibration of all instrumentation as directed by the manufacturer's representative.
- D. The performance tests shall be conducted at such time as all anticipated odorous air streams are present in the carbon adsorption system inlet. The time of the tests and detailed test procedure shall be submitted for approval prior to the testing period. The testing should occur during peak odor season, typically in the summer months.
 - a.

Testing for the passive systems shall be as follows:

1. Hydrogen sulfide concentration shall be measured in each carbon inlet and outlet. As a minimum, the test shall be conducted continuously for 24 hours utilizing a logging instrument such as an OdaLog.
- E. Results: A description of the performance tests shall be submitted. Should carbon adsorption system performances not meet any of the above removal requirements specified in Paragraph 1.06, system shall have failed the performance tests. The manufacturer shall make any additions or modifications to the carbon adsorption system that may be necessary, at no additional cost to the OWNER, and the performance tests for that system shall be repeated in its entirety.

END OF SECTION

SECTION 15400

PLUMBING - GENERAL PROVISIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, services and incidentals required and install and test a complete plumbing system as specified and shown on the Drawings and Specifications:
 - 1. 15410 - Plumbing - Piping Systems
- B. More specifically the work shall include, but shall not be limited to the following:
 - 1. All items included under the Scope of Work of other Plumbing Sections.
 - 2. Cutting, coring and rough patching in accordance with Section 01045.
 - 3. All parts necessary to make a complete Plumbing System ready for continuous operation.
 - 4. The absence of pipe supports and details on the Drawings shall not relieve the CONTRACTOR of the responsibility for providing them.

1.02 RELATED WORK

- A. The following work related to, but not covered under the plumbing work will be done under other related Sections.
 - 1. All piping systems in the building other than the plumbing work specified in the Plumbing Sections.
 - 2. Yard piping for sanitary and storm drains beyond 10-ft-0-in outside the building unless otherwise indicated.
 - 3. Source for potable and protected water and gas services shall terminate as hereinafter specified.
 - 4. Valve tags are furnished under Section 01170, but installed on Plumbing items under this Section.
 - 5. Excavating and backfilling is included under Division 2.
 - 6. Manholes, catch basins, gasoline trap and buried pipe encasement are included under Division 2.
 - 7. Concrete is included under Division 3.
 - 8. Painting is included under Division 9.

9. Ductwork is included elsewhere in Division 15.
10. Electrical work is included under Division 16.

1.03 SUBMITTALS

- A. Inspection by the ENGINEER's representative or failure to inspect shall not relieve the CONTRACTOR of responsibility to provide materials and perform the work in accordance with the documents.
- B. Submit, in accordance with Section 01300, shop drawings and product data to establish compliance with this Section. Submittals shall include the following:
 1. Shop drawings and technical literature covering details of all equipment, fixtures and accessories being furnished under this Section prior to fabrication, assembly or shipment.
 2. Provide a list of recommended spare parts as well as spare parts being provided.
 3. Furnish no less than 15 days before start-up, a schedule of all exposed valves installed under this Section. The schedule shall include for each valve the location, type, a number, words to identify the valve function, and the normal operating position.
 4. Detailed layout drawings of piping in mechanical rooms and other congested areas shall be provided. Drawings shall show the locations of piping appurtenances, specialties, and all valve banks.
 5. For units that will be shipped exposed, provide a description of the protective packaging that will be used during transit.
 6. All submittals shall contain a statement that Section 15400 and all other referenced Sections have been read and complied with. The certification statement shall be made by all of the following that are applicable; the CONTRACTOR, sub-contractor and the vendor. The statement shall be an individual statement for each party involved, and shall be included with every submittal and resubmittal.
- C. Operation and Maintenance Data
 1. Operating and maintenance manuals shall be furnished to the ENGINEER as provided in 01730. The manuals shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc, that are required to assist operation and maintenance personnel unfamiliar with such equipment. The following information shall be considered a minimum. Where applicable, provide information required for specific pieces of equipment.
 - a. Personnel familiar with the operation and maintenance of the specific information shall prepare manuals.
 - b. Equipment shall be identified with the ENGINEER's Equipment Numbers and Identification as shown in the Schedules and on the Drawings.

- c. Provide information in three ring binders. All sheets shall have reinforced punches. Tabbed dividers shall separate all sections. Drawings will be bound in the manual, or contained in envelopes bound into the manual.
2. Contents - Each volume shall contain the following minimum contents:
 - a. Installation including instructions for unpacking, installing, aligning, checking and testing. Foundation data, allowable piping loads, and electrical design shall be included.
 - b. Operating Instructions to provide pre-operational checks, start up and shut down, and description of all control modes. Include emergency procedures for all fault conditions and actions to be taken for all alarms. Procedures for long term storage shall be included.
 - c. Maintenance shall include preventive, and corrective. Schedules for test of other functions are to be included. Provide a list of tools required to service the equipment. Trouble shooting instructions to include a trouble-shooting guide shall be included.
- D. In general, corrections or comments or lack thereof, made relative to submittals during review shall not relieve the CONTRACTOR from compliance with the requirements of the drawings and specifications. Submittals are for review of general conformance with the design concepts of the project and general compliance with the contract documents. The CONTRACTOR is responsible for the final design conforming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating the work of all trades, and performing the work in a safe and satisfactory manner.

1.04 MANUFACTURERS SERVICES

- A. A representative of the manufacturer who has complete knowledge of proper operation and maintenance shall be provided for the number of 8 hour days as listed below to instruct representatives of the OWNER and the ENGINEER on proper operation and maintenance. With the ENGINEER's permission, this work may be conducted in conjunction with the inspection and the installation and test run as provided under PART 3. If there are difficulties in operation of the equipment due to the manufacturer's design or fabrication, additional service shall be provided at no additional cost to the OWNER.
- B. Provide manufacturer's services for testing and start-up of the following equipment:
 1. Reduced Pressure Backflow Preventers (1-Day).

1.05 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
- B. American National Standards Institute (ANSI)
- C. American Water Works Association (AWWA)
- D. National Fire Protection Association (NFPA)

- E. National Electrical Manufacturers Association (NEMA)
- F. Plumbing and Drainage Institute (PDI)
- G. Cast Iron Soil Pipe Institute (CISP)
- H. Underwriters Laboratories (UL)
- I. Factory Mutual (FM)
- J. American Society of Plumbing Engineers Data Book (May be used as a design guide.)
- K. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.06 QUALITY ASSURANCE

- A. The CONTRACTOR shall be fully responsible for the proper execution and performance of the work described herein. It shall be their responsibility to inspect all installation conditions and bring to the attention of the ENGINEER any conditions which may affect their work adversely. They shall report to the ENGINEER, prior to commencing any portion of this work, any conditions unsuitable for the installation of their portion of the work.
- B. Mention herein or indication on the Drawings of equipment, materials, operation or methods shall require that each item mentioned or indicated be provided to make a complete system of plumbing ready for continuous operation.
- C. The location of all equipment, fixtures and piping shall be considered as approximate only and the right is reserved by the ENGINEER to change at any time, before the work is installed, the position of such equipment and piping to meet structural conditions and to provide proper headroom clearance or for other sufficient causes and such changes shall be made without additional expense to the OWNER.
- D. Attention is called to the necessity for elimination of transmission of vibration from mechanical equipment to building structures. All equipment, therefore, shall be carefully selected and installed to meet this condition and isolators and water hammer arrestors shall be provided where required.
- E. Instruct such persons as designated by the OWNER in the care and use of all plumbing equipment and piping systems installed.
- F. Comply with all the laws, ordinances, codes, rules and regulations of the State, local or other authorities having jurisdiction over any of the work specified herein.
- G. Obtain all required permits and pay all legal fees for the same and in general take complete charge and responsibility for all legal requirements pertaining to this Section of the work.
- H. Requirements set forth in this Section and indicated on the Drawings shall be followed when in excess of the required or minimum regulations.

- I. If any work is performed and subsequent changes are necessary to conform to the regulations, such change shall be made as part of this work at no additional cost to the OWNER.
- J. All work shown on the Drawings is intended to be approximately correct to scale, but figured dimensions and detailed drawings shall be followed in every case. The Drawings shall be taken in a sense as diagrammatic. Size of pipes and general method of running them are shown, but it is not intended to show every offset and fitting nor every structural difficulty that may be encountered. To carry out the true intent and purpose of the Drawings all necessary parts to make complete working systems ready for use shall be furnished without extra charge.
- K. Refer to the Structural and Architectural Drawings which indicate the type of construction in which the work shall be installed. Locations shown on the Plumbing Drawings shall be checked against the general and detailed drawings of the construction proper. All measurements must be taken at the building.
- L. All equipment of a given type included in this Section shall be furnished by or through a single manufacturer or as specified on the schedules
- M. Inspection by the ENGINEER's representative or failure to inspect shall not relieve the CONTRACTOR of responsibility to provide materials and perform the work in accordance with the documents.
- N. The piping manufacturer shall furnish an affidavit of compliance certifying that all materials used and work performed complies with the specified requirements. The CONTRACTOR shall provide copies of mill test confirming the type of material used in the various components.
- O. The OWNER and ENGINEER reserve the right to sample and test any materials after delivery and to reject all components represented by a sample that fails to comply with the specified requirements.
- P. An authorized representative of the manufacturer shall perform the initial startup of the equipment. The OWNER and ENGINEER shall witness startup. The use of local sales representatives to perform this work is not acceptable, unless the manufacturer provides documented evidence that the sales representative has been specifically trained for this work.
- Q. All rotating parts of equipment shall be statically and dynamically balanced at the factory.

1.07 ENGINEERING SERVICES

- A. When engineering services are specified to be provided by the CONTRACTOR, the CONTRACTOR shall retain a licensed professional engineer to perform the work. The engineer shall be licensed at the time the work is done and in the state in which the project is located. If the state issues discipline specific licenses, the engineer shall be licensed in the applicable discipline. In addition, the ENGINEER shall be experienced in the type of work being provided.
- B. All work is to be done according to the applicable regulations for professional engineers, to include signing, sealing and dating documents. When submittals are required by a professional engineer, in addition to state required signing and sealing, a copy of the current wallet card or wall certificate indicating the date of expiration shall be included with the submittal.

1.08 SERVICE AND UTILITY CONNECTIONS

A. Sanitary Water

1. The sanitary waste and drainage systems shall terminate at the sump pits or at points 10-ft-0-in outside the building or as otherwise shown on the Drawings.

B. Water Service

1. The source of water for potable and protected use in the building will be brought to the building under another Division of the work and left as a flanged connection 8-in to 12-in outside of the foundation wall or above the finish floor, except where noted otherwise.
2. The water meter and backflow preventer units shall be furnished and installed complete with all components as shown on Water Piping Diagrams. The water connections shall be made to these units as shown and from these points furnish and install all water to the equipment as shown on the Drawings.

C. Natural Gas Services

1. Will be brought to exterior locations adjacent to building where shown on the Drawings, complete with meters and pressure regulators.
2. Make the final connection to each meter and regulator outlet and extend each service into the building. From each point, extend the service and make all final valved connections to each demand as shown on the Drawings.

1.09 DELIVERY, STORAGE AND HANDLING

A. Refer to requirements of Section 01600.

B. All materials shall be inspected for size, quality and quantity against approved shop drawings upon delivery.

C. Delivery schedule of all equipment shall be coordinated with the CONTRACTOR. Equipment ready for shipment prior to the agreed on shipping date shall be stored without cost to the OWNER by the manufacturer.

D. All materials shall be suitably packed for shipment and long term storage. Each package shall be labeled to indicate the project and the contents of each package. Where applicable, equipment numbers shall be marked on the container.

E. All equipment shipped that is exposed such as on a flat bed truck shall be protected during transit. The equipment shall be protected from moisture, road salt, dirt and stones or other materials thrown up from other vehicles. Electrical components shall be protected as above, but with special attention to moisture. The method of shipment protection shall be defined in the submittals.

F. Instructions for the servicing and startup of equipment in long term or prolonged storage shall accompany each item.

- G. All materials shall be stored in a covered dry location off of the ground. When required to protect the materials they shall be stored in a temperature-controlled location.

1.10 COORDINATION

- A. The Drawings indicate the extent and general arrangement of the systems. If any departures from the drawings or specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted as soon as practical for review. No such departures shall be made without the prior written concurrence of the ENGINEER.
- B. The CONTRACTOR shall coordinate the location and placement of all concrete inserts and welding attachments with the structural engineer.
- C. The CONTRACTOR shall assume full responsibility for coordination of the Plumbing systems, including; scheduling, and verification that all structures, piping and the mounting of equipment are compatible.
- D. The CONTRACTOR shall start up each piece of equipment and system and shall make all adjustments so that the system is placed in proper operating condition.

1.11 SUPPORTS

- A. All components shall be provided with lugs, brackets or field supplied devices to allow the components to be firmly attached to the structure. The lugs, brackets or field supplied devices shall be sized to withstand the seismic loads for the area and type of application.

1.12 SEISMIC RESTRAINTS

- A. Seismic restraints shall be provided for all piping and equipment as required by applicable codes. All seismic criteria and design shall comply with Seismic Design Category D.
- B. Materials of construction for seismic supports shall be the same as those specified for equipment supports and hangers, and pipe hangers. All bolts shall be stainless steel regardless of the specified support material.
- C. Where the seismic criteria and size of piping are within the limits of the latest edition of the SMACNA Seismic Restraint Manual, the restraints as defined in the manual can be used. Restraints shall meet the seismic design criteria in Section 01615.
- D. The CONTRACTOR shall retain a professional structural engineer registered in the State of California to provide seismic loadings and designs of seismic restraints. This will include but not be limited to the following:
 - 1. Provide seismic loadings to the vibration isolation supplier based on actual equipment being used to allow the proper selection of vibration isolators.
 - 2. Provide sizing of bolts for attachment of non-vibrating equipment to the structure based on the actual equipment being used.
 - 3. Provide design of required additional bracing for equipment when vibration isolators or bolts are not adequate to withstand seismic forces.

4. Provide design of bracing for all suspending equipment.
- E. Provide design of bracing for all piping that exceeds the limitations of the SMACNA Seismic Restraint Manual.
- F. Signed and sealed calculations and details shall be submitted for record purposes.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 INSTALLATION

- A. All the items specified in Section 15410 under PART 2 shall be installed according to the applicable manufacturer's recommendations, the details shown on the Drawings and as specified herein and in other related Sections.
- B. The CONTRACTOR shall start up each piece of equipment and system and shall make all adjustments so that the system is placed in proper operating condition.
- C. The CONTRACTOR shall not install any equipment or materials until the OWNER and ENGINEER have approved all submittals. If any equipment or materials are installed prior to approval of the submittals, it shall be at the CONTRACTOR's risk.
- D. All work shall be installed in accordance with the manufacturer's printed instructions and shall be rigid, plumb and true to line, with all parts in perfect working order. Maintain protective covers on all units until final cleanup time and at that time remove covers and clean and polish all surfaces.

3.02 VALVE TAGS

- A. The work of this Section shall also include the installation of valve tags furnished by the CONTRACTOR. All valves provided under this Section shall be tagged.

3.03 PROTECTION

- A. Materials, fixtures and equipment shall be properly protected at all times and all pipe openings shall be temporarily closed so as to prevent obstruction and damage.

3.04 COORDINATION SKETCHES

- A. It shall be the responsibility of the subcontractor to have employed a competent coordinator of mechanical systems and as such to provide all coordination of drawings or sketches as may be required or deemed necessary by the ENGINEER to obtain the required ceiling heights and eliminate conflicts with all piping, ducts and electrical installation.

END OF SECTION

SECTION 15410

PLUMBING - PIPING SYSTEMS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The areas where work is to be accomplished is described in Section 15400.
- B. This Section specifies the basic Plumbing Systems of Piping and the materials of each system, including valves and associated appurtenances.
- C. Furnish all labor, materials, equipment, services and incidentals required and install complete Plumbing Piping Systems as shown on the Drawings and as specified herein.
 - 1. Sanitary - Waste and Vent Systems
 - 2. Potable Cold Water Systems
 - 3. Service Water Systems (Non Potable)
 - 4. Natural Gas System
 - 5. Furnishing and installing all piping, valves, dielectric fittings, floor drains, cleanouts, sleeves, hangers and insulation in conjunction with the above listed piping systems.
 - 6. All piping, and equipment shown on the Drawings is intended to be approximately correct to scale, but figured dimensions and detailed drawings of the actual equipment furnished shall be followed in every case. The Drawings shall be taken in a sense as diagrammatic. Size of piping is shown, but it is not the intent to show every offset or fitting, nor every hanger or support, or structural difficulty that may be encountered. To carry out the intent and purpose of the Drawings all necessary parts to make a complete working system ready for use shall be furnished without extra charge. The CONTRACTOR shall be responsible to coordinate the system installation and routing with the work of all trades.

1.02 RELATED WORK

- A. Refer to Section 15400.

1.03 SUBMITTALS

- A. Submit, in accordance with Sections 15400 and 01300, shop drawings and technical literature covering details of all plumbing-piping systems being furnished under this Section prior to fabrication, assembly or shipment.
- B. For units that will be shipped exposed, provide a description of the protective packaging that will be used during transit.

- C. All submittals shall contain a statement that Sections 15400, 15410 and all other referenced Sections have been read and complied with. The certification statement shall be made by all of the following that are applicable; the CONTRACTOR, sub-contractor and the vendor. The statement shall be an individual statement for each party involved, and shall be included with every submittal and resubmittal.
- D. Detailed layout drawings of piping in mechanical rooms and other congested areas shall be provided. Drawings shall show the locations of piping appurtenances, specialties, and all valve banks.
- E. Provide manufacturers catalogs, literature, and engineering data on all hangers and supports. Load ratings, materials, and installation shall be in accordance with the recommendations of MSS SP-58 and MSS SP-69.

1.04 REFERENCE STANDARDS

- A. Refer to Section 15400.

1.05 SERVICE AND UTILITY CONNECTIONS

- A. Refer to Section 15400.

1.06 QUALITY ASSURANCE

- A. Refer to Section 15400.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 15400.

1.08 COORDINATION

- A. Refer to Section 15400.

1.09 SEISMIC RESTRAINTS

- A. Refer to Section 15400.

PART 2 PRODUCTS

2.01 PIPING SYSTEM MATERIALS

- A. Sanitary Waste Water Systems
 - 1. The pipe and fittings shall be SV (Service) hub and spigot cast iron soil pipe and fittings conforming to ASTM A74 and ANSI A112.5.1 tarred inside and out at the foundry.
 - 2. Joints for below grade piping shall be installed with compression gaskets conforming to ASTM C564 or shall be installed with lead and oakum.

3. Piping above grade shall be of the above mentioned hub and spigot type or of the No-Hub type conforming to the Cast Iron Soil Pipe Institute Standards 301. Pipe shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute.
4. The No-Hub coupling shall be Anaheim Foundry Co. Husky SD4000, Clamp-All 125 or by MG Coupling Co.
5. Copper piping may be used for sanitary waste and vent in sizes 2-in and smaller. Pipe shall be Type "L" used with either cast or wrought DWV fittings. Solder Alloy 95TA (95 percent Tin, 5 percent Antimony), ASTM B32. No solder containing lead shall be utilized on the project.

B. Water Systems (Potable)

1. Piping shall be Type "L" copper with cast bronze or wrought copper, solder type fittings for above grade and Type "K" for where buried or shall be flanged end, ductile iron. Solder Alloy 95TA (95 percent Tin, 5 percent Antimony), ASTM B32. No solder containing lead shall be utilized on the project.
2. All copper piping 2-1/2-in and larger and all buried copper piping shall be Type S-2 brazed. Brazing filler metal classified as BCu4 or BCu5, with minimum melting point of 1300 degrees F. Use wrought fittings for brazing.

C. Natural Gas Systems

1. Aboveground Piping Materials

a. Piping and Fittings

- (1) Elbows and tees shall be of the same type and class of material as the pipe.
- (2) Type BCS: Black carbon steel piping shall conform to ASTM A 53/A 53M, Type S seamless. Pipe shall have Schedule 40 wall.

- b. Fittings shall be long-radius butt weld carbon steel conforming to ASTM A 234/A 234M and ASME B16.1 to match pipe wall thickness. Bending of pipe is not permitted. Aboveground terminal fittings shall be 150-pound working steam pressure (wsp) forged steel, weld neck flanges to match wall thickness, conforming to ASTM A 694/A 694M, ASME B16.5, and ASTM A 181/A 181M, Class 60.

2. Underground Piping Materials

a. Piping and Fittings

- (1) Elbows and tees shall be of the same type and class of material as the pipe. All piping and fittings shall be from the same manufacturer.
- (2) High density polyethylene (HDPE) piping meeting the requirements of ASTM D2513. Piping shall be labeled "Gas" and "ASTM D2513". Pipe and Tubing furnished under this specification shall be manufactured using compounds

complying with the requirements of Part 192 of the Minimum Federal Safety Standards. Dimensional characteristics (including outside diameter, wall thickness, toe-in, ovality and length) and performance characteristics (including chemical resistance, sustained pressure, elevated temperature service, burst pressure/apparent tensile strength, joining, squeeze-off and outdoor storage stability) shall conform to the requirements of ASTM D2513 including applicable annexes. Pipe and Tubing may be supplied in either coils or straight lengths.

- b. Fittings shall be HDPE, butt fusion, meeting the requirements of ASTM D2513. Polyethylene fittings furnished under this specification shall be manufactured using compounds complying with the requirements of Section II, above and all appropriate requirements of Part 192 of the Minimum Federal Safety Standards. Socket type fittings shall comply with ASTM D2683. Butt fusion fittings shall comply with ASTM D3261. Electrofusion fittings shall comply with ASTM F1055. Plastic mechanical fittings shall comply with ASTM F1924. Mechanical fittings produced from metallic or materials other than plastics listed in Section II shall be approved only after submission of appropriate test data and service histories indicating their acceptability for the intended service. In addition, all mechanical fittings shall be categorized for pullout resistance as stated in ASTM D2513 and identified as to the appropriate category. Plastic valves shall meet the requirements of ANSI Standard B16.40. In all cases, the specifications and requirements for the fittings supplied shall comply with the appropriate sections of Part 192 of the Minimum Federal Safety Standards or NFPA 58 LP Gas Code. Fittings shall be joined per the manufacturer's instructions.

3. Gas train vent piping shall be of the same material as that specified for low pressure piping systems.

D. Dielectric Fittings

1. On all water piping systems, provide dielectric fittings at all locations between piping and components of dissimilar metals.

E. Piping Specialties

1. Equipment Connections

- a. Connectors shall be corrugated bronze metal with brazed inverted flare-type brass fittings complete with transition for ips connection. Maximum length shall be six feet. Connectors shall be AGA-approved type.

2. Pressure Regulator

- a. Pressure regulator shall be service-type, complete with automatic low-pressure cutoff and automatic pressure relief. Shop drawing shall be submitted and shall include performance curves. Body shall be cast iron. Valve shall be capable of shutting off under supply pressures to 100 psi. Valve spring range shall be 7 to 10 inches water gage (wg), and set point shall be 8 inches. Outlet pressure shall vary by not more than ½-in wg from the set point over the capacity range of the regulator. Pressure relief shall be diaphragm-operated, spring-loaded type with vent for relief of excess pressure. Release set point shall be 12 inches wg.

- b. Low-pressure cutoff regulator shall be adjustable to shut off gas supply entirely if pressure drops below set point. Supply shall remain shut off until manual reset of regulator takes place.
- c. Pressure regulator diaphragm vent and pressure relief vent shall be run as separate, jointless, full size vent lines connected to the vent tapping and terminating at an approved outside location with weatherproof, bugproof, screened vent cap.

3. Pressure Gages

- a. Pressure gages shall conform to ASME B40.100, Type I, Class 1. Pressure gage size shall be 3-1/2-inch nominal diameter. Case shall be corrosion-resistant steel conforming to any of the AISI 300 series of ASTM A 666, with a No. 4 standard commercial polish or better. All gages shall be equipped with adjustable red marking pointer and damper screen adjustment in inlet connection.

4. Line Strainers

- a. Strainers shall be Y-type with removable basket. Strainers in sizes 2-inch ips and smaller shall have screwed ends; sizes 2-1/2-inch ips and larger shall have flanged ends. Body working pressure rating shall exceed maximum service pressure of system in which installed by at least 50 percent. Body shall have cast-in arrows to indicate direction of flow. All strainer bodies fitted with screwed screen retainer shall have straight threads and shall be gasketed with nonferrous metal. Strainer bodies fitted with bolted-on screen retainers shall have offset blowdown holes. Body material shall be cast bronze conforming to ASTM B 62 or cast iron conforming to Class 30 ASTM A 278/A 278M. Where system material is nonferrous, strainer body material shall be nonferrous.
- b. Minimum free hole area of strainer element shall be equal to not less than 3 times the internal area of connecting piping. Strainer screens for natural gas service shall have mesh cloth not to exceed 0.006 inch. Strainer screens shall have finished ends fitted to machined screen chamber surfaces to preclude bypass flow. Strainer element material shall be AISI Type 304 corrosion-resistant steel.

2.02 VALVES

A. General

1. It is the intention of the Plumbing Drawings and this Section to require control valves at the bottom of all water service risers and as shown on the Drawings.
2. Install drawoff valves on the house side of main control valves, at the bottom of all risers, at all low points and where shown on the Drawings. Drawoffs shall consist of a hose end valve as hereinafter described.
3. Group and locate control valves in all locations so they may be easily operated, through access panels, doors, or adjacent to equipment.

4. Valves, in general, shall be of the same manufacture throughout unless noted otherwise. All valves, except as noted otherwise, shall be made for 125 lb steam working pressure and shall have round iron wheel handles.

B. Water Valves

1. All water valves 2-in and smaller shall be full port ball type similar to Watts FBV/FBVS; Apollo 77-200, Nibco T/S 585-70 or Hammond 8301/8311.
2. All check valves 3-in and smaller shall be Hammond IB-912; Stockham B-309 or Nibco Inc. S-413.
3. Hose end valves (HEV) shall be a ball valve with hose end adapter. Units on potable water systems shall be equipped with a hose connection vacuum breaker similar to Watts No. 8A or equal.

C. Gas Valves

1. Gas valves 2-in and smaller shall be three-piece bronze ball valve with threaded ends equal to Hammond 8604; Watts B-6800 (YRPV) or Apollo 82-100, modified with tee handles.
2. Gas valves larger than 2-in shall be lubricated plug valves equal to valves manufactured by Powell; Homestead and Rockwell.
3. Gas valves shall be listed suitable for natural gas service.

2.03 DRAINS

- A. For the purpose of explanation and description only, the following drain catalog numbers are taken from the catalogs of Zurn Industries, Inc. unless otherwise noted. Those drains as manufactured by J.R. Smith Mfg. Co. or Josam Mfg. Co. and determined by the ENGINEER to be equal in every respect to those specified will be acceptable for installation. All drains shall be of sizes, shown on the Drawings.

B. Floor Drains (FD) / Trench Drains (TD)

1. All floor drains and open ended drains shall be fitted with a deep seal cast iron "P" type or "running" type trap to suit drain outlet. Traps shall be acid resisting material where noted.
2. Floor drains shown on the Drawings as (AW) and installed in corrosive resistant piping systems shall be of same material as the acid resisting pipe and fittings described above.
3. All floor drains shall have cast iron or acid resisting drainage flange, seepage control, ½-in trap primer connection where required, clamping collar and inside caulk outlet or resilient gasket pipe connection, unless noted otherwise to be IPS outlet.

4. Schedule of Floor Drains

<u>Type</u>	<u>Cat. No.</u>	<u>Remarks</u>
AW	Fuseal 7750	Polypropylene drain and strainer for acid resisting installation

2.04 CLEANOUTS

- A. For the purpose of explanation and description only, the following cleanout catalog numbers are taken from the catalogs of Zurn Industries, Inc. unless otherwise noted. Those drains manufactured by J.R. Smith Mfg. Co. or Josam Mfg. Co. as and determined by the ENGINEER to be equal in every respect to those specified will be acceptable for installation. All cleanouts shall be of size shown on the Drawings.
- B. In cast iron bell and spigot pipe, cleanouts shall consist of a cast iron ferrule and extra heavy brass tapered screw cleanout plug with square or hexagonal nuts.
- C. In threaded pipe, (galvanized steel with recessed drainage pattern fittings) cleanouts shall consist of standard iron pipe size (IPS) brass plugs screwed into drainage fittings.
- D. In copper tubing they shall consist of copper to IPS adapters with IPS brass plugs screwed into female threaded portion of the adapter.
- E. Acid resisting pipe terminal cleanouts shall be of acid resisting material and of the type recommended by the manufacturer of the pipe and fittings.
- F. Flush Floor Cleanouts
 - 1. Flush floor cleanouts (FCO) shall be Zurn Z-1400 or equal.
- G. Exterior Cleanouts
 - 1. Exterior cleanouts shown as Exterior FCO shall consist of cast iron floor cleanout with serrated cutoff sections and brass screwed raised head plug, Zurn Z-1449, with heavy cast iron access box and gasketed cover, Zurn Z-1474, or equal. Set flush with concrete slab.

2.05 SLEEVES AND CASTINGS

- A. Sleeves
 - 1. Sleeve all piping through walls, beams and partitions. All wall sleeves shall finish flush with the finish line.
 - 2. Sleeve all piping passing through floor slabs. All sleeves shall extend 2-in above the finish floor slab.
 - 3. All sleeves for exterior emergency shower eye wash units shall be packed with insulation.

4. Materials and installation conforming to the requirements of Section 01172 shall be furnished under this Section.
5. Refer to "Typical Detail Sheets" for additional information.

B. Castings

1. Provide waterproof castings on each plumbing pipe penetrating walls of wet wells, tanks or pits. Castings shall be of size and length to suit pipe and wall thickness.
2. Materials and installation conforming to the requirements of Section 01172 shall be furnished under this Section.

2.06 HANGERS, SUPPORTS AND ANCHORS

- A. Piping support systems shall include restraints as required by the applicable building codes to withstand seismic loading. Design shall be provided by a professional engineer hired by the CONTRACTOR as specified in Section 15400.
- B. The absence of pipe supports and details on the drawings shall not relieve the CONTRACTOR of the responsibility for providing them.
- C. In certain locations, pipe supports, anchors, guides, and expansion joints may be indicated on the drawings. The CONTRACTOR shall be responsible to provide a complete system of supports, expansion joints, and anchors. Additional supports may be required adjacent to expansion joints, couplings, and valves.
- D. Hangers supporting horizontal piping at ceilings shall be of the clevis type and spaced 8-ft apart for supply and service pipe 1-1/2-in diameter and larger; and 6-ft apart for pipe smaller than 1-1/2-in diameter.
- E. Horizontal piping buried in earth under lowest floor slabs shall be supported with the hanger types shown on the Drawings except where otherwise required to be encased in concrete.
- F. All hangers shall be of a type to permit vertical adjustment after installation.
- G. Supports and hangers for cast iron soil piping shall be installed in accordance with the latest addition of the cast iron soil pipe handbook unless noted otherwise.

2.07 INSULATION

- A. All water piping of every description specified herein including rainwater, drinking fountain waste and pressure waste piping shall be completely insulated throughout with 1-in thick Heavy Density Pipe Insulation.
- B. All fittings, flanges, roof drain bodies and valves shall be covered with permanently non-combustible, one-piece, factory premolded, insulated fitting covers.
- C. Provide at each hanger location a rigid insulation insert with a galvanized metal covering protector shield, equal to items as manufactured by Pipe Shields Inc. or equal. Protector shields

shall be of length as recommended by the manufacturer and shall be the same thickness and jacket material as the adjoining insulation.

- D. Insulation material shall be of molded rigid fiberglass sectional pipe insulation rated to 500 degrees F. The insulation shall have a minimum density of 3.5 lbs/cu ft and a maximum "K" factor of 0.24 at 75 degrees F mean temperature. Jacket shall be kraft paper bonded to aluminum foil reinforced with fiberglass yarn and self sealing lap with maximum permeability of 0.02 perms.
- E. Supplies, drain and trap on handicapped lavatories shall be insulated with fully molded, white, closed cell vinyl insulation kit, Truebro, Model 120W-105 or equal.

2.08 PIPE MARKING AND COLOR CODING

- A. Pipe marking is included in Division 9, but it shall be part of the work of this Section to assist as required by the ENGINEER to identify the pipe contents, direction of flow and all pertinent data required for proper marking of pipe.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install all piping, valves, hangers and appurtenances as specified herein and in the referenced Sections above.
- B. The CONTRACTOR shall not install any equipment or materials until the OWNER and ENGINEER have approved all submittals. If any equipment or materials are installed prior to approval of the submittals, it shall be at the CONTRACTOR's risk.
- C. In general, corrections or comments or lack thereof, made relative to submittals during review shall not relieve the CONTRACTOR from compliance with the requirements of the drawings and specifications. Submittals are for review of general conformance with the design concepts of the project and general compliance with the contract documents. The CONTRACTOR is responsible for the final design conforming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating the work of all trades, and performing the work in a safe and satisfactory manner.
- D. Underground Piping Systems Installation
 - 1. Installation
 - a. Installation of underground natural gas systems shall be in accordance with NFPA 54, NFPA 58, ASME B31.8. OWNER shall be notified by the CONTRACTOR 48 hours in advance of start of installation.
 - b. All excavations shall be dry and clear of extraneous materials when pipe is being laid. Piping shall be laid beginning at the low point of a system; when in final position it shall be true to the grades and alignment indicated, with unbroken continuity of invert.

- c. Piping passing through and ground floor slab shall pass through pipe sleeves larger than conduit and shall be made watertight. In fill areas, piping passing under or through building grade beams shall have a minimum clearance of 4 inches in all directions to prevent damage.
- d. On excavations occurring near and below building footing, the backfilling material shall consist of Class 2000A concrete poured or pressure grouted up to the level of the footing.
- e. Where pipe penetrates earth or concrete grade, not less than 6 inches of Type BCS pipe shall be exposed to view.
- f. Type BCS materials shall be installed for underground piping in accordance with the manufacturer's instructions. Pipe shall be palletized in padded pallets at the factory and shall be handled from pallet to final position with padded gear.

2. Marking

- a. Polyethylene pipe and tubing shall be marked in accordance with ASTM D2513. Marking shall be legible and shall remain legible under normal handling and installation practices. Indent marking may be utilized provided (1) the marking does not reduce the wall thickness to less than the minimum value for the pipe or tubing, (2) it has been demonstrated that these marks have no effect on the long term strength of the pipe or tubing and (3) the marking will not provide leakage channels when approved elastomeric gasket compression fittings are used to make joints.
- b. PE pipe fusion fittings shall be marked on the body or hub. Marking shall be in accordance with ASTM D2513 or the standard to which the fitting is manufactured. Mechanical fittings shall be marked in accordance with the fitting standard to which it is manufactured or Part 192 of the Minimum Federal Safety Standard Section 192.63.

E. Aboveground Piping Systems Installation

1. Installation

- a. Installation of aboveground natural gas systems shall be in accordance with NFPA 54, NFPA 58, ASME B31.8. OWNER shall be notified by the CONTRACTOR 48 hours in advance of start of installation.
- b. Pipe shall be fabricated to measurements established on the job and shall be carefully worked into place without springing or forcing. Adequate provision shall be made for absorbing all expansion and contraction without stress in any part of the system.
- c. Pipe, tubing, fittings, valves, equipment, and accessories shall be visibly clean and free of foreign material before being installed into the respective systems. Pipe shall be cleaned by hammering, shaking, or swabbing, or by a combination of methods. Lines shall be purged with dry, oil-free compressed air after erection, but purging out shall not be relied upon for removing all foreign matter.

- d. During the process of construction, open ends of pipe, fittings, and valves shall be properly protected at all times to prevent the admission of foreign matter. Plugs or caps shall be placed in the ends of installed work at all times when connecting work is not actually under way. Plugs shall be commercially manufactured products approved by the OWNER.
- e. Outlets, including valve outlets, shall be securely closed gastight with a threaded plug or cap immediately after installation and shall be left closed until the gas equipment is connected thereto.
- f. Piping shall be installed straight and true with approved offsets around obstructions and with expansion bends or fitting offsets essential to a satisfactory installation, and as may be necessary to increase headroom or to avoid interference with the building construction, electric conduit, or facilities equipment.
- g. Standard pipe fittings shall be used for changes in direction; no mitered joints or unapproved pipe bends will be permitted.
- h. Horizontal piping shall have a slope of 1 inch per 100 feet.
- i. Reducers shall be concentric or eccentric. Eccentric reducers shall be used where required to permit proper drainage of pipe lines. Bushings as reducers are not permitted. Drain valves shall be provided in all piping systems at low points.

F. Joints

- 1. Pipe ends shall be reamed before joint connections are made. Screwed joints shall be made up with joint compound. Joint compounds shall be applied to the male thread only, and care shall be exercised to prevent compound from reaching the interior of the pipe.
- 2. Unions shall be provided wherever required to permit convenient removal of equipment, valves, and piping accessories from the piping system.
- 3. HDPE piping for butt fusion joints shall be cut square, and burrs shall be removed with approved cutting and reaming tools. Inside surfaces of fittings and outside surfaces of tubes in joint area shall be cleaned before assembly of joint. Heat source shall be applied with the manufacturer's instructions to provide proper joining action to achieve 100 percent shear-line strength. Joints that fail pressure tests shall be remade with new materials, including pipe or fittings.
- 4. Fusion Qualifications
 - a. The manufacturer of pipe, tubing and/or fittings supplied under this specification shall establish and certify heat fusion procedures for the joining of the materials supplied in accordance with the applicable section of (CFR) Title 49, Part 192 "Transportation of Natural and/or Other Gases by Pipeline: Minimum Federal Safety Standards" paragraph 192.283. Qualified fusion procedures, with appropriate supporting data, shall be furnished to the purchaser upon request. Suitable generic fusion procedures are included in PPI TR-33, Generic Butt Fusion Joining Procedure for Polyethylene (PE) Gas Pipe.

G. Valves

1. Install control valves to all locations grouped and located to be easily operated, through access panels, doors, or adjacent to equipment.
2. Install all final Water connections to Process equipment. Each connection shall be preceded by a ball valve directly adjacent to the unit.
3. Install all valves in a horizontal to upright position. Valves shall not be installed in down position from the horizontal.

H. Screwed Connections

1. All screwed connections shall have full thread of true taper, accurate to gauge and conform to ANSI.
2. Reduction in size shall be made using reducing fittings.
3. The use of bushings or close nipples is prohibited. Nipples shorter than 4-in in length shall be Schedule 80.
4. Plugs shall be steel or brass with square head.
5. Screwed joints shall be made with an approved joint compound applied to the male thread only. Caulking of screwed joints will not be allowed.

I. Soldering (Copper Tubing)

1. Tubing shall be cut with square ends and reamed to prevent burrs, out-of-round or improperly sized ends.
2. After cutting, all surfaces to be soldered shall be thoroughly cleaned to a metal-bright finish, free from dirt, grease or other material before fluxing and soldering. This cleaning shall be performed by using emery cloth, sandpaper or steel wool. Clean the outside end of the tubing for a length of 1/2-in greater than the depth of the fitting. The inside of the fittings shall be cleaned in a similar manner. Apply non-corrosive flux and assemble the joint. Acid solder or acid flux will not be allowed.
3. The surfaces to be joined shall be heated up slowly and uniformly to the melting point of the solder. The surface being soldered shall be maintained above the melting point of the solder for sufficient time to draw the solder completely into the joint. When the solder congeals to a plastic state the excess metal shall be removed with a cloth brush, leaving a fillet around the end of the fitting. Full penetration of the solder uniformly throughout the entire socket is required. The soldered joints shall be allowed to cool in still air until only warm to the hand after which the work may be quenched.
4. Any type of crack, pinhole, area of incomplete penetration, or similar defect will not be accepted. Peening for closing up defects shall not be permitted.
5. Heating torches of sufficient size shall be used for heating of large fittings prior to soldering. Multiple tips or ring burners for use on combination torches may be used.

6. Remove all external and internal loose solder and flux after joint cools.

J. Brazing

1. Cutting and cleaning of tubing shall be as specified for soldering operations.
2. Apply flux in accordance with recommendations of manufacturer of brazing filler material being used. Apply to outside of fitting and heat affected area of tubing. Avoid getting flux inside tube. Flux may be omitted when joining copper tubes to wrought copper fittings but is required for joining to cast (bronze) fittings.
3. Assemble joint by inserting tube into socket hard against stop and turning.
4. Heat parts to be joined beginning 1-in from edge of fitting, continuously moving the flame. When flux has become transparent, begin to heat the fitting at the base of the cup, still continuously moving the flame. When flux at fitting is quiet and transparent, maintain heat along joint by moving flame along axis between fitting and tubing.
5. Apply brazing material at point where tubing enters socket of fitting. Avoid putting flame on brazing material. Heated joint should melt brazing material and capillary action will draw material into the joint. When joint is properly made, a fillet of filler metal will be visible completely around the joint. Stop adding filler metal when fillet is formed.
6. After brazing material has solidified, clean off flux residue. Fittings must cool naturally. Quenching will not be allowed.
7. Any type of crack, pinhole, area of incomplete penetration, or similar defect will not be accepted. Penning for closing up defects will not be permitted.

K. Insulation

1. Do not apply insulation until pipes and tanks have been tested and accepted by all parties making inspection. All insulated covering shall be guaranteed for a period of one year.
 - a. Insulate piping to hose bibs and hose outlets to a point six feet above the floor.

L. Cleanouts

1. Install cleanouts as directed by applicable code, at end of each branch soil and waste line where waste and soil lines change direction, at the bottom of every riser either as a cleanout tee above floor or end cleanout in the horizontal below the floor.

3.02 FIELD TESTING

- A. Provide all air and water necessary for testing the piping systems as specified under this Section of the work. Provide all connections for testing under this Section. Remove all debris resulting from testing. Use the water in an efficient and economical manner.
- B. Provide all apparatus and all other supplies or materials which may be necessary for testing the systems and operating the apparatus during the period while tests of any kind are being made, or for carrying out the work of the Contract.

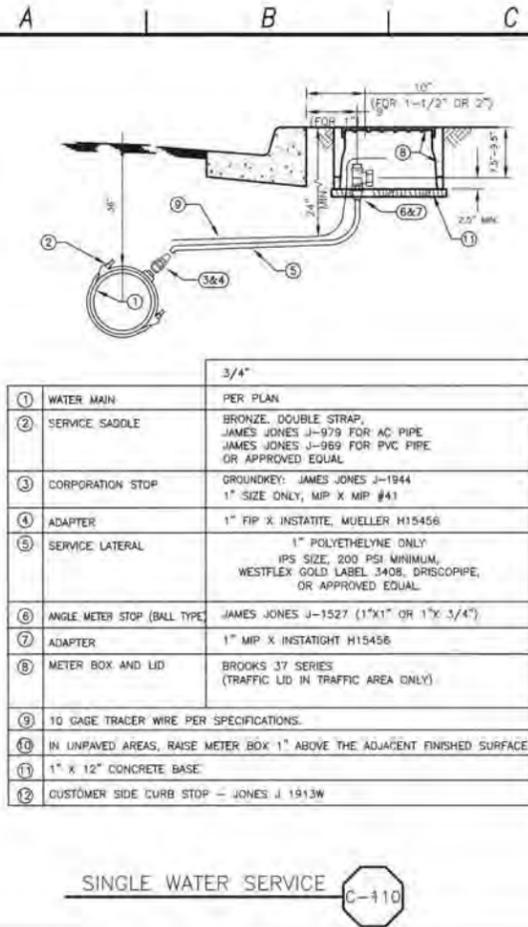
- C. The various piping systems shall be subjected to water, smoke, or air tests as noted and shall hold tight at pressures stated without extra pumping or water addition for the time intervals stated.
- D. All additional tests, methods or materials that may be required by the local ordinances and not specifically specified herein, shall be made as directed by the ENGINEER or the local inspection authority.
- E. Provide for all repeated tests as necessary to make systems tight as required.
- F. Test soil, waste, drain, vent piping as follows:
 - 1. Test rough drainage of soil, waste, drain, vent and rainwater leader by plugging piping where it terminates in the building or where it leaves the building by filling each system completely with water to the outlets on the roof after all outlets in section have been plugged or capped, for at least 1 hour duration.
 - 2. If it becomes necessary during the construction of the building to test a part of a section for any reason or to cover permanently any pipe before piping above the part or section has been completed, apply a water test to such part or section of the piping by maintaining a 10-ft head of water on the highest section of the piping and the test shall hold tight for 1 hour.
- G. Test water piping as follows:
 - 1. Test all interior potable hot, cold and protected water piping to a water pressure of 150 psi to the lowest level and maintain this pressure without additional pumping for 2 hours.
- H. Test gas piping as follows:
 - 1. Test all gas piping with air under pressure as required and recommend by the NFPA Pamphlet Nos. 54 and 58 Regulations which shall be considered as part of this Section.

3.03 CLEANING

- A. At the completion of the work, clean all piping, fixtures, equipment, apparatus and exposed trim for same included in this Section and, where required, polish ready for use.
- B. Thoroughly disinfect the entire potable water distribution systems with a solution of not less than 50 ppm of available chlorine. Allow the disinfecting solution to remain in the system for a period of 3 hours after which time, open all valves and faucets and flush the system with clean water until the residual chlorine content is not greater than 0.2 ppm, unless otherwise directed.

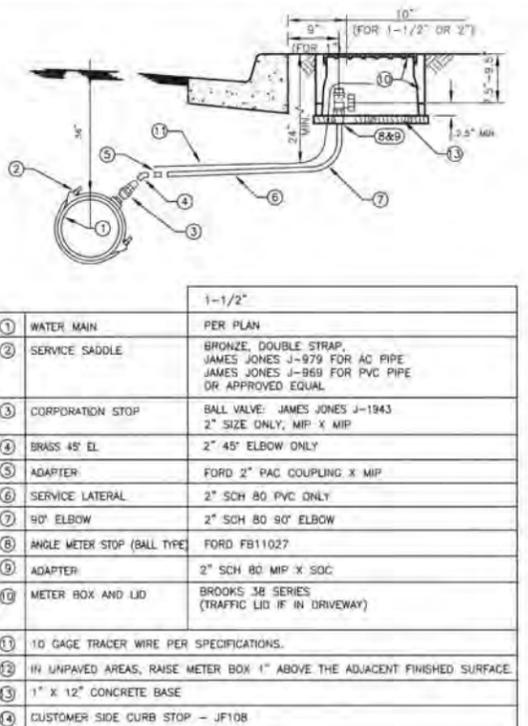
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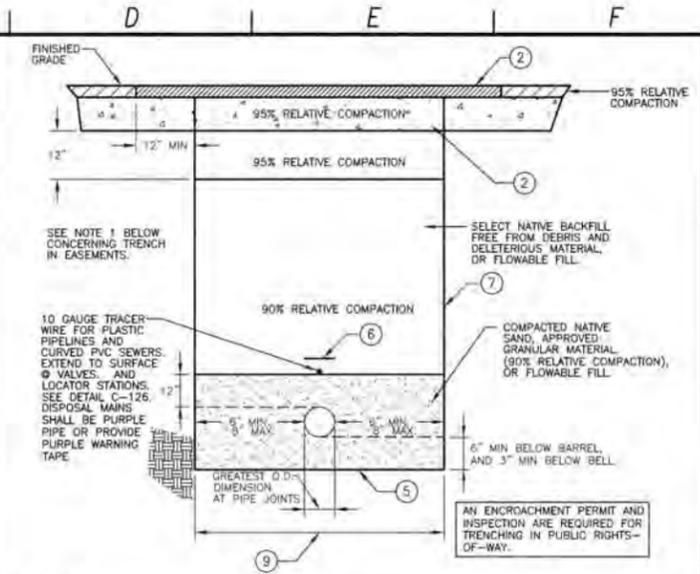
①	WATER MAIN	PER PLAN
②	SERVICE SADDLE	BRONZE, DOUBLE STRAP, JAMES JONES J-979 FOR AC PIPE, JAMES JONES J-969 FOR PVC PIPE OR APPROVED EQUAL
③	CORPORATION STOP	GROUNDKEY: JAMES JONES J-1944, 1" SIZE ONLY, MIP X MIP #41
④	ADAPTER	1" FIP X INSTANTITE, MUELLER H15456
⑤	SERVICE LATERAL	1" POLYETHYLENE ONLY, IPS SIZE, 200 PSI MINIMUM, WESTFLEX GOLD LABEL 3408, DRISCOPIPE, OR APPROVED EQUAL
⑥	ANGLE METER STOP (BALL TYPE)	JAMES JONES J-1527 (1"x1" OR 1"x 3/4")
⑦	ADAPTER	1" MIP X INSTANTITE H15456
⑧	METER BOX AND LID	BROOKS 37 SERIES (TRAFFIC LID IN TRAFFIC AREA ONLY)
⑨	10 GAGE TRACER WIRE PER SPECIFICATIONS.	
⑩	IN UNPAVED AREAS, RAISE METER BOX 1" ABOVE THE ADJACENT FINISHED SURFACE.	
⑪	1" X 12" CONCRETE BASE	
⑫	CUSTOMER SIDE CURB STOP - JONES J 1913W	

SINGLE WATER SERVICE C-110



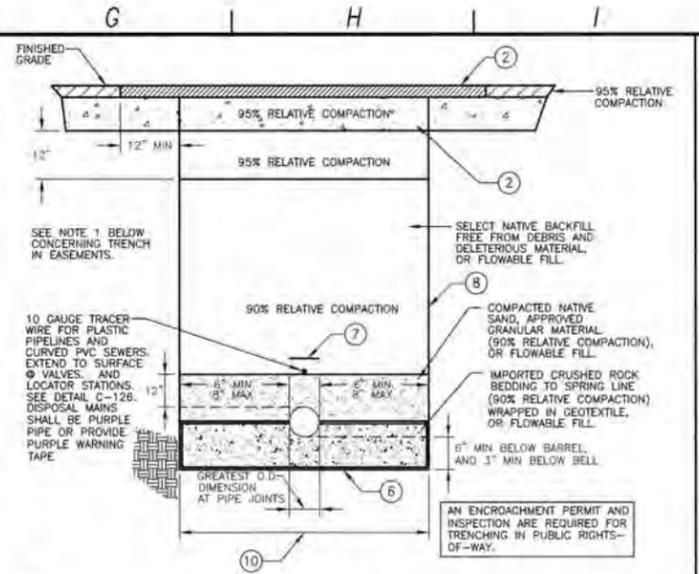
①	WATER MAIN	PER PLAN
②	SERVICE SADDLE	BRONZE, DOUBLE STRAP, JAMES JONES J-979 FOR AC PIPE, JAMES JONES J-969 FOR PVC PIPE OR APPROVED EQUAL
③	CORPORATION STOP	BALL VALVE: JAMES JONES J-1943, 2" SIZE ONLY, MIP X MIP
④	BRASS 45° EL	2" 45° ELBOW ONLY
⑤	ADAPTER	FORD 2" PAC COUPLING X MIP
⑥	SERVICE LATERAL	2" SCH 80 PVC ONLY
⑦	90° ELBOW	2" SCH 80 90° ELBOW
⑧	ANGLE METER STOP (BALL TYPE)	FORD FB11027
⑨	ADAPTER	2" SCH 80 MIP X SOG
⑩	METER BOX AND LID	BROOKS 38 SERIES (TRAFFIC LID IF IN DRIVEWAY)
⑪	10 GAGE TRACER WIRE PER SPECIFICATIONS.	
⑫	IN UNPAVED AREAS, RAISE METER BOX 1" ABOVE THE ADJACENT FINISHED SURFACE.	
⑬	1" X 12" CONCRETE BASE	
⑭	CUSTOMER SIDE CURB STOP - JF108	

SINGLE WATER SERVICE C-111



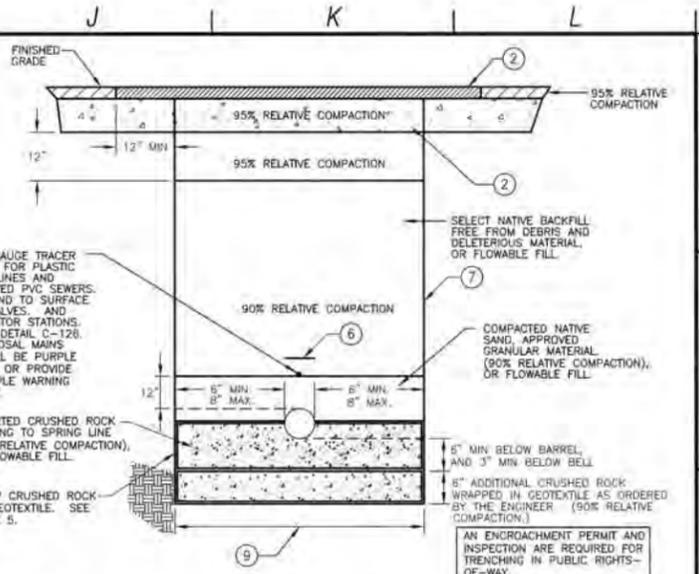
- NOTES:
- A MINIMUM OF 90% RELATIVE COMPACTION IS PERMITTED IN A NON-ROADWAY TRENCH WHEN NO STRUCTURES ARE TO BE BUILT OVER THE TRENCH. IF STRUCTURES ARE TO BE BUILT OVER THE TRENCH, USE RELATIVE COMPACTIONS SHOWN ON THE TRENCH SECTION ABOVE.
 - PAVEMENT SECTIONS SHALL BE NO LESS THAN EXISTING STRUCTURAL SECTIONS, AND AS REQUIRED BY THE COUNTY FOR TRENCHES WITHIN A COUNTY RIGHT-OF-WAY. SEE DETAIL C-120.
 - SEE DETAIL C-116B FOR WET TRENCH SECTION.
 - A DRY TRENCH IS A TRENCH IN NON-GROUNDWATER AREAS.
 - WHERE THE BOTTOM OF THE TRENCH HAS BEEN DISTURBED, THE CONTRACTOR SHALL SCARIFY AND COMPACT THE SUBGRADE TO 90% RELATIVE COMPACTION.
 - 3" WIDE POLYETHYLENE NON-DETECTABLE WARNING TAPE 12" ABOVE ALL PIPE AND LATERALS.
 - VERTICAL TRENCH WALL DEPICTED, SHORING SHALL BE DESIGNED BY CONTRACTOR. TRENCH WALLS MAY BE SLOPED, CONTRACTOR SHALL COORDINATE TRENCH CONFIGURATION WITH OTHER GRAVITY, FORCEMAIN, RECYCLED WATER, AND CONDUIT PIPELINE TRENCH SECTIONS, AND CONFORM TO CULTURAL AND ENVIRONMENTAL RESTRICTIONS, THE TRAFFIC MANAGEMENT PLAN REQUIREMENTS, AND SHALL PROTECT EXISTING IMPROVEMENTS.
 - IF FLOWABLE FILL IS USED FOR BACKFILL, CONTRACTOR SHALL PROTECT AGAINST BUOYANT FORCE.
 - THIS DIMENSION AT PIPE SPRINGLINE, PLUS 24" FOR T-CUT, CONSTITUTES THE PAY LIMIT FOR AC AND AB REPLACEMENT, UNQ IN TABLE 1 OF DETAIL C-120A.

PIPELINE DRY TRENCH SECTION 10" AND SMALLER C-116



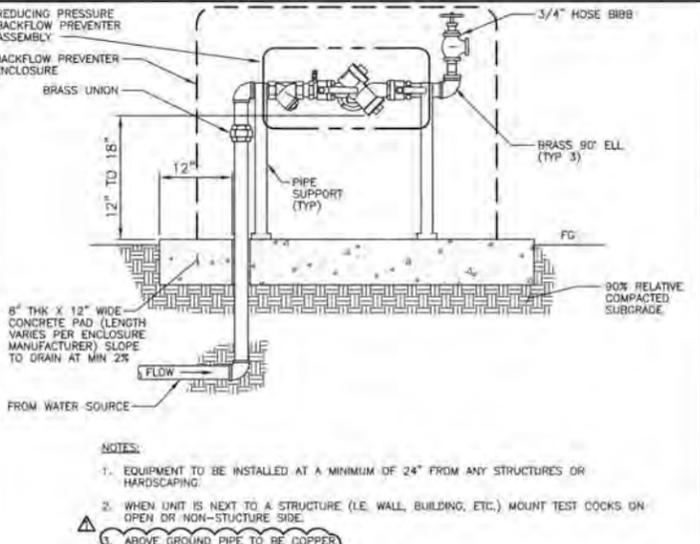
- NOTES:
- A MINIMUM OF 90% RELATIVE COMPACTION IS PERMITTED IN A NON-ROADWAY TRENCH WHEN NO STRUCTURES ARE TO BE BUILT OVER THE TRENCH. IF STRUCTURES ARE TO BE BUILT OVER THE TRENCH, USE RELATIVE COMPACTIONS SHOWN ON THE TRENCH SECTION ABOVE.
 - PAVEMENT SECTIONS SHALL BE NO LESS THAN EXISTING STRUCTURAL SECTIONS, AND AS REQUIRED BY THE COUNTY FOR TRENCHES WITHIN A COUNTY RIGHT-OF-WAY. SEE DETAIL C-120.
 - SEE DETAIL C-116B FOR WET TRENCH SECTION.
 - A DRY TRENCH IS A TRENCH IN NON-GROUNDWATER AREAS.
 - ENDS OF GEOTEXTILE SHALL TOUCH PIPE BARREL. GEOTEXTILE MAY BE LAPPED UNDER PIPE IF DESIRED.
 - WHERE THE BOTTOM OF THE TRENCH HAS BEEN DISTURBED, THE CONTRACTOR SHALL SCARIFY AND COMPACT THE SUBGRADE TO 90% RELATIVE COMPACTION.
 - 3" WIDE POLYETHYLENE NON-DETECTABLE WARNING TAPE 12" ABOVE ALL PIPE AND LATERALS.
 - VERTICAL TRENCH WALL DEPICTED, SHORING SHALL BE DESIGNED BY CONTRACTOR. TRENCH WALLS MAY BE SLOPED, CONTRACTOR SHALL COORDINATE TRENCH CONFIGURATION WITH OTHER GRAVITY, FORCEMAIN, RECYCLED WATER, AND CONDUIT PIPELINE TRENCH SECTIONS, AND CONFORM TO CULTURAL AND ENVIRONMENTAL RESTRICTIONS, THE TRAFFIC MANAGEMENT PLAN REQUIREMENTS, AND SHALL PROTECT EXISTING IMPROVEMENTS.
 - IF FLOWABLE FILL IS USED FOR BACKFILL, CONTRACTOR SHALL PROTECT AGAINST BUOYANT FORCE.
 - THIS DIMENSION AT PIPE SPRINGLINE, PLUS 24" FOR T-CUT, CONSTITUTES THE PAY LIMIT FOR AC AND AB REPLACEMENT, UNQ IN TABLE 1 OF DETAIL C-120A.

PIPELINE DRY TRENCH SECTION 12" AND LARGER C-116A



- NOTES:
- A MINIMUM OF 90% RELATIVE COMPACTION IS PERMITTED IN A NON-ROADWAY TRENCH WHEN NO STRUCTURES ARE TO BE BUILT OVER THE TRENCH. IF STRUCTURES ARE TO BE BUILT OVER THE TRENCH, USE RELATIVE COMPACTIONS SHOWN ON THE TRENCH SECTION ABOVE.
 - PAVEMENT SECTIONS SHALL BE NO LESS THAN EXISTING STRUCTURAL SECTIONS, AND AS REQUIRED BY THE COUNTY FOR TRENCHES WITHIN A COUNTY RIGHT-OF-WAY. SEE DETAIL C-120.
 - SEE DETAILS C-116 AND C-116A FOR DRY TRENCH SECTIONS.
 - A WET TRENCH IS A TRENCH IN GROUNDWATER AREAS BUT HAS BEEN DEWATERED IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS.
 - ENDS OF GEOTEXTILE SHALL TOUCH PIPE BARREL. GEOTEXTILE MAY BE LAPPED UNDER PIPE IF DESIRED.
 - 3" WIDE POLYETHYLENE NON-DETECTABLE WARNING TAPE 12" ABOVE ALL PIPE AND LATERALS.
 - VERTICAL TRENCH WALL DEPICTED, SHORING SHALL BE DESIGNED BY CONTRACTOR. TRENCH WALLS MAY BE SLOPED, CONTRACTOR SHALL COORDINATE TRENCH CONFIGURATION WITH OTHER GRAVITY, FORCEMAIN, RECYCLED WATER, AND CONDUIT PIPELINE TRENCH SECTIONS, AND CONFORM TO CULTURAL AND ENVIRONMENTAL RESTRICTIONS, THE TRAFFIC MANAGEMENT PLAN REQUIREMENTS, AND SHALL PROTECT EXISTING IMPROVEMENTS.
 - IF FLOWABLE FILL IS USED FOR BACKFILL, CONTRACTOR SHALL PROTECT AGAINST BUOYANT FORCE.
 - THIS DIMENSION AT PIPE SPRINGLINE, PLUS 24" FOR T-CUT, CONSTITUTES THE PAY LIMIT FOR AC AND AB REPLACEMENT, UNQ IN TABLE 1 OF DETAIL C-120A.

PIPELINE WET TRENCH SECTION ALL DIAMETERS C-116B



BACKFLOW PREVENTER WITH HOSE BIBB AND ENCLOSURE NOT TO SCALE C-112

DESIGNED BY: BJC
 DRAWN BY: JAW
 CHECKED BY: MDM
 DATE: APRIL 2012

CDM Smith
 2295 Gateway Oaks Drive, Suite 240
 Sacramento, CA 95833
 Tel: (916) 567-9900

IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY

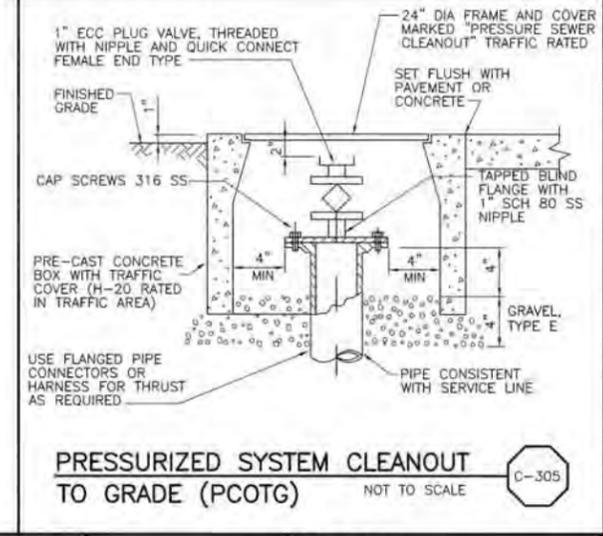
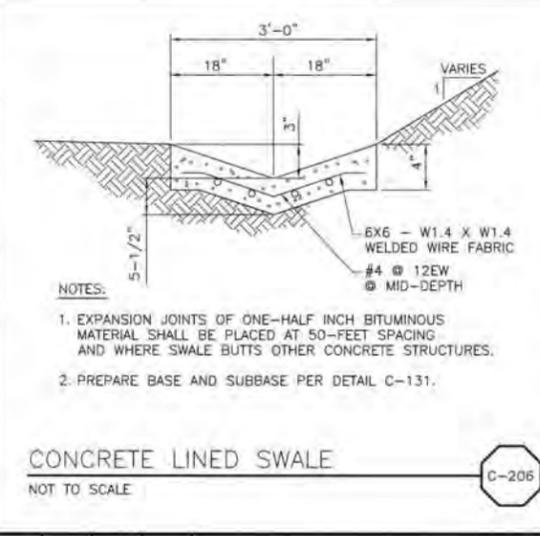
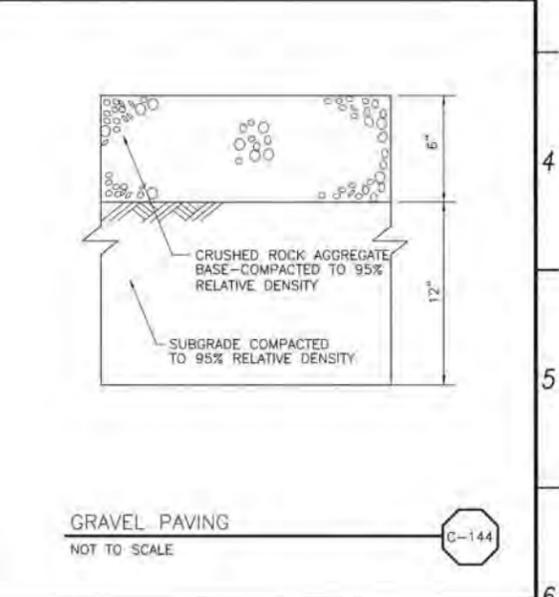
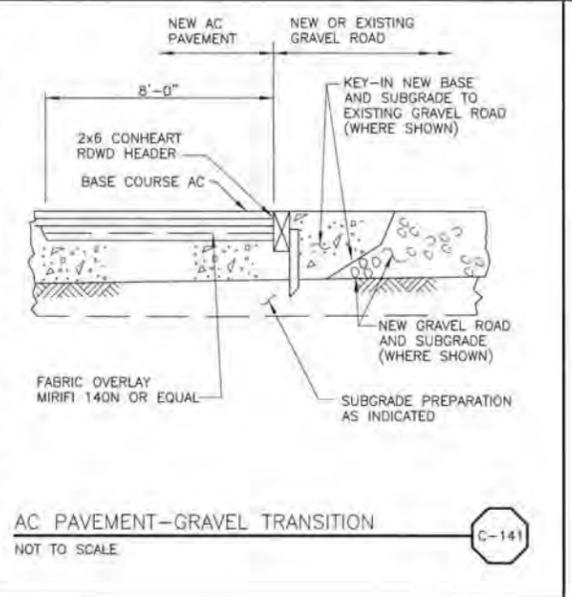
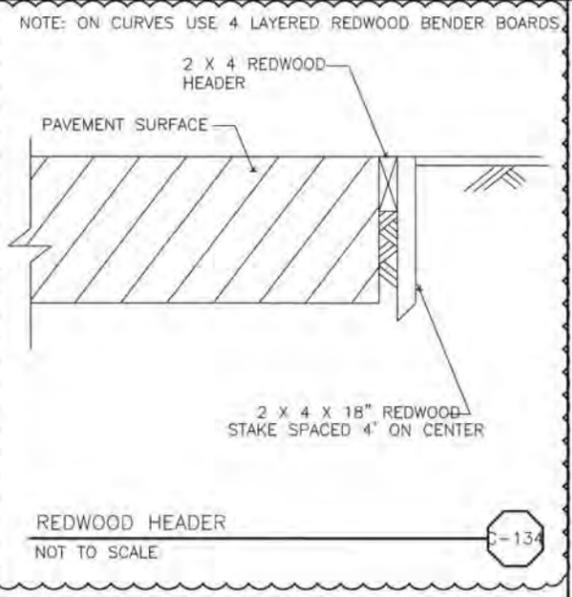
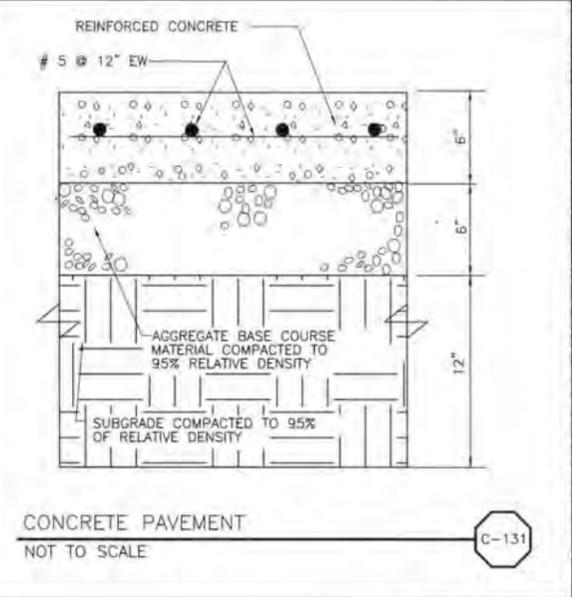
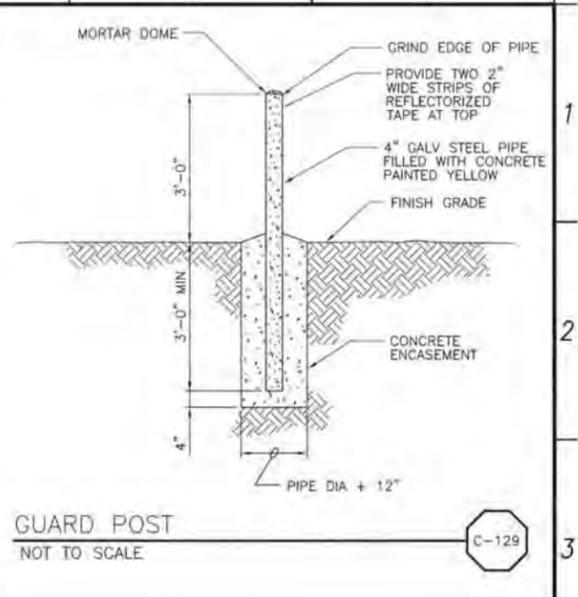
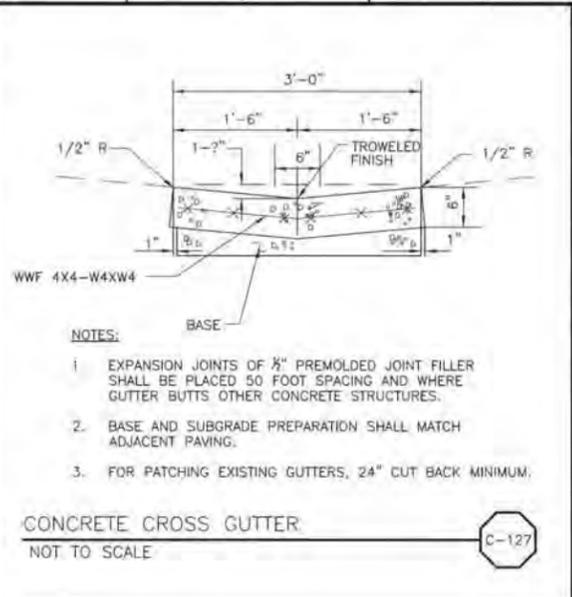
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 AT LEAST TWO DAYS BEFORE YOU DIG
 UNDERGROUND SERVICE ALERTS BY WITHIN CALIFORNIA

LOS OSOS WASTEWATER COLLECTION SYSTEM
 GENERAL CIVIL STANDARD CIVIL DETAILS - 2

PROJECT NO. 42502-83120
 FILE NAME: B-GC-061
 SHEET NO. B-GC-061

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A B C D E F G H I J K L



DESIGNED BY:	BJC
DRAWN BY:	JAW
CHECKED BY:	MDM
DATE:	APRIL 2012

CDM Smith
2295 Gateway Oaks Drive, Suite 240
Sacramento, CA 95833
Tel: (916) 867-9900

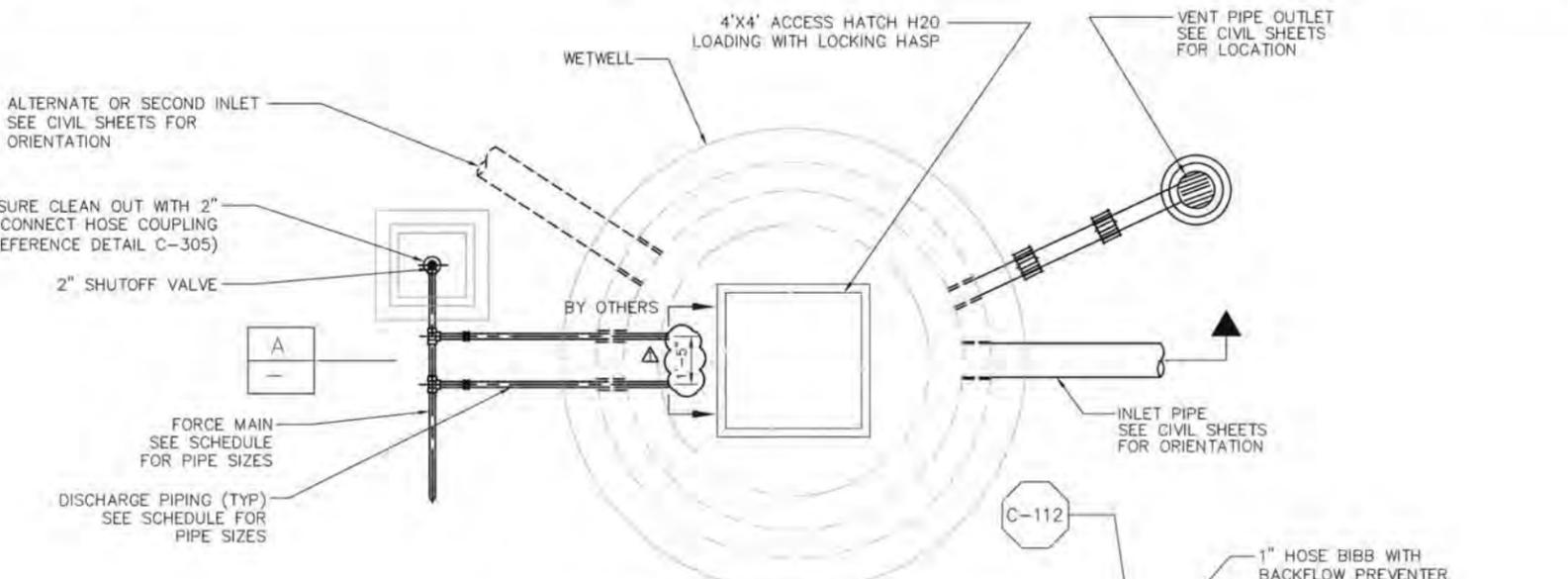


LOS OSOS WASTEWATER COLLECTION SYSTEM
**GENERAL CIVIL
STANDARD CIVIL DETAILS - 5**

PROJECT NO. 42502-83120
FILE NAME: B-GC-064
SHEET NO.
B-GC-064

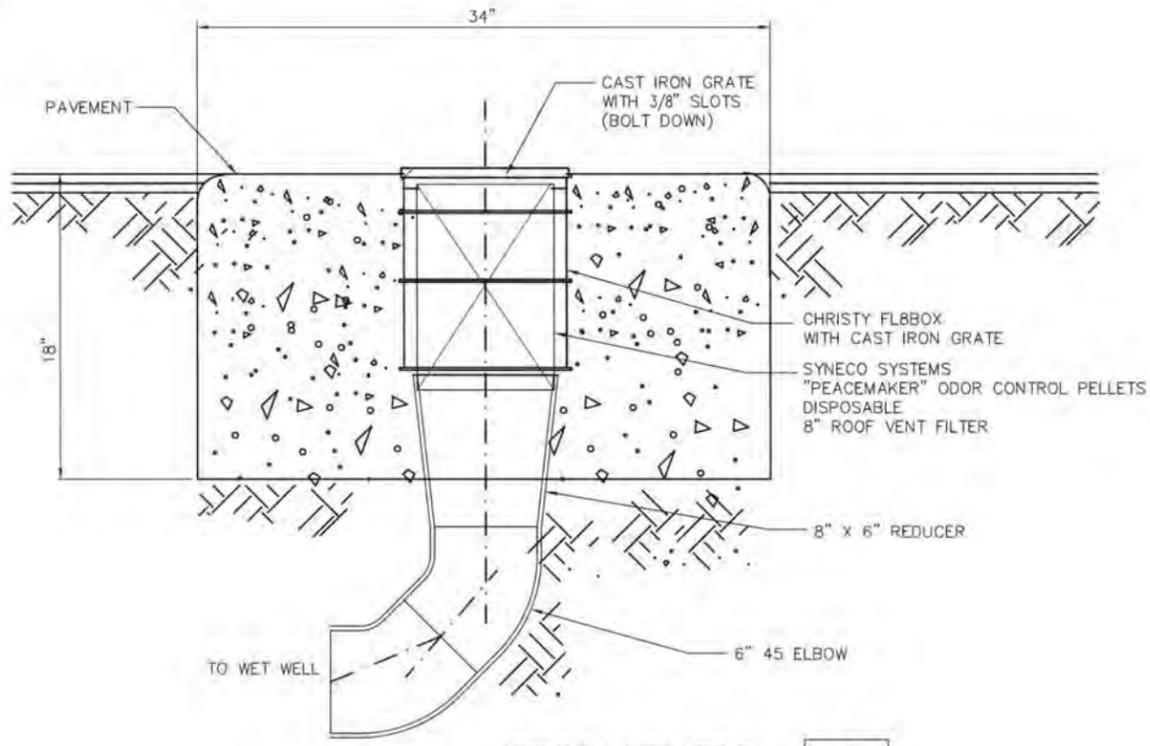
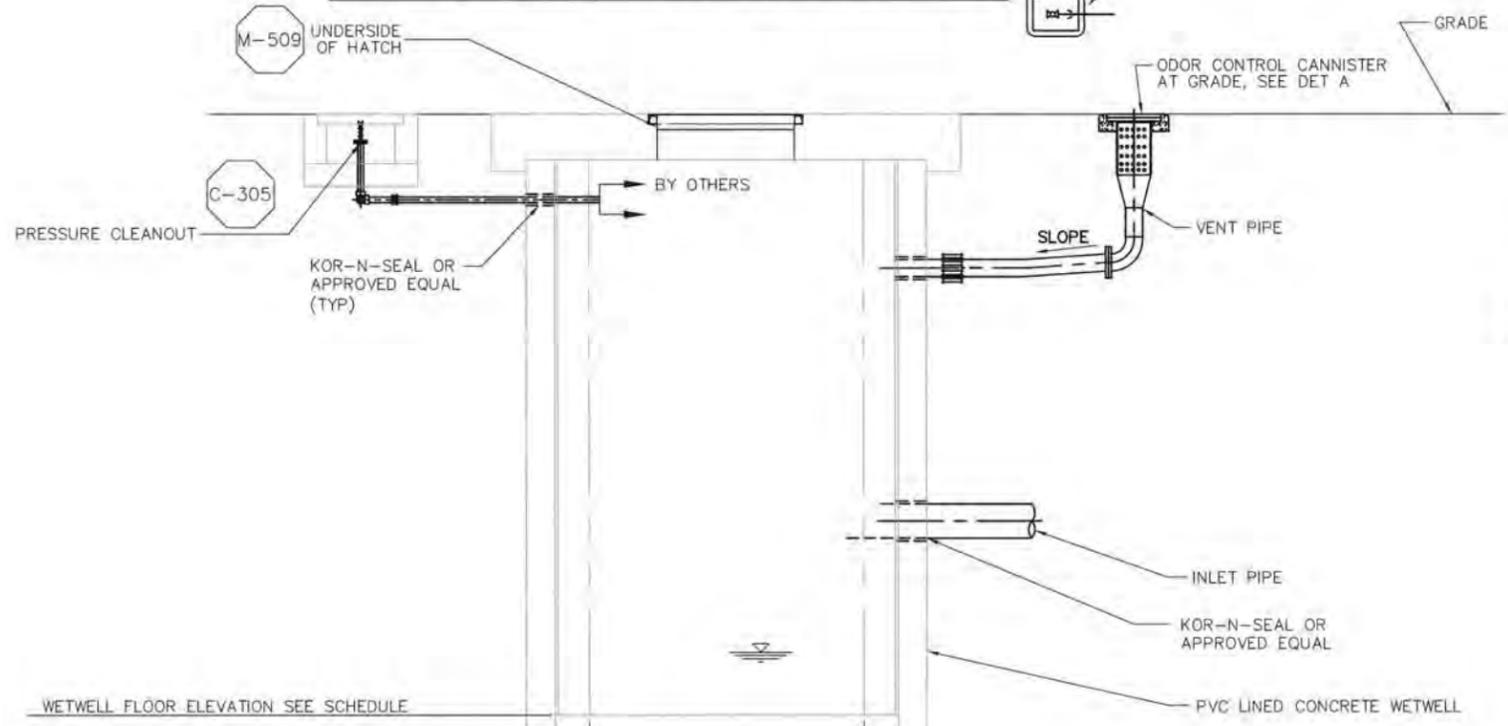
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A B C D E F G H I J K L



POCKET GRINDER PUMP STATION SCHEDULE	
DESCRIPTION	5A
AREA	8
TOP WETWELL SLAB ELEVATION (FT)	88
WETWELL FLOOR ELEVATION (FT)	71.86
WETWELL DEPTH (FT)	16.34
WETWELL DIAMETER (FT)	10
INLET PIPING SIZE (IN)	8
NUMBER OF INLETS	2
INLET PIPING INVERT ELEVATION (FT)	81.79
	75.83
DISCHARGE PIPING SIZE (IN)	2
FORCE MAIN SIZE (IN)	3
FORCE MAIN CENTERLINE ELEVATION (FT)	84.88

TYPICAL POCKET PUMP STATION PLAN



ODOR CONTROL CANNISTER DETAIL

- NOTES:
- REFER TO CIVIL DRAWINGS FOR CONTINUATION OF PIPING.
 - CONTRACTOR TO VERIFY INLET PIPING CONDITIONS WITH COLLECTION SYSTEM PIPING.
 - CONTRACTOR TO VERIFY INLET PIPING AND WETWELL ELEVATION CONDITIONS.

SECTION A
POCKET PUMP STATION

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/01/12	LLB	MDM		ADDENDUM #1

DESIGNED BY: MPH
 DRAWN BY: JAW
 CHECKED BY: CCA
 DATE: APRIL 2012



IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY

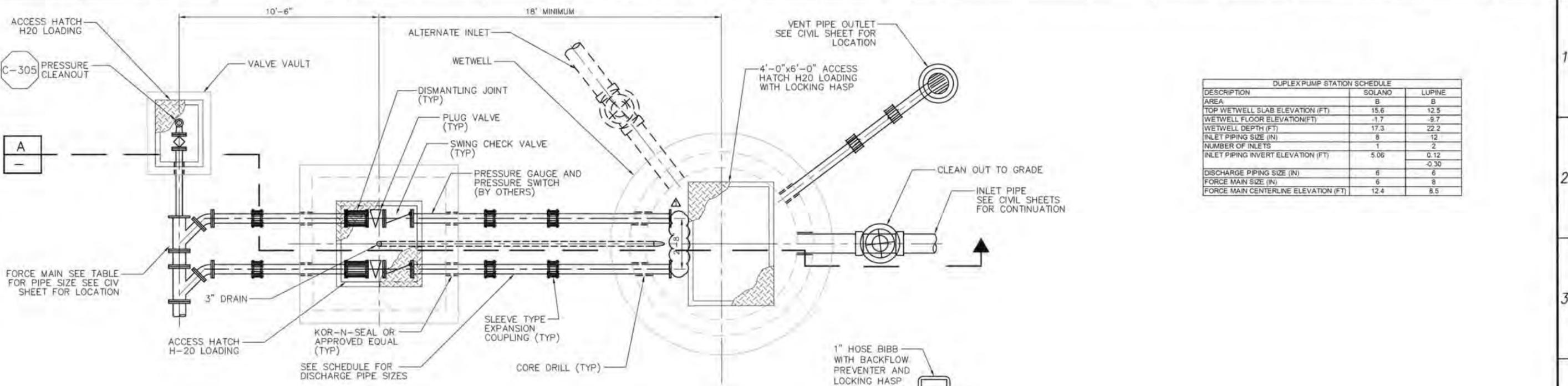


LOS OSOS WASTEWATER COLLECTION SYSTEM
MECHANICAL
POCKET PUMP STATIONS
PLAN & SECTIONS

PROJECT No. 42502-B3120
 FILE NAME: B-M-003
 SHEET NO.
B-M-003

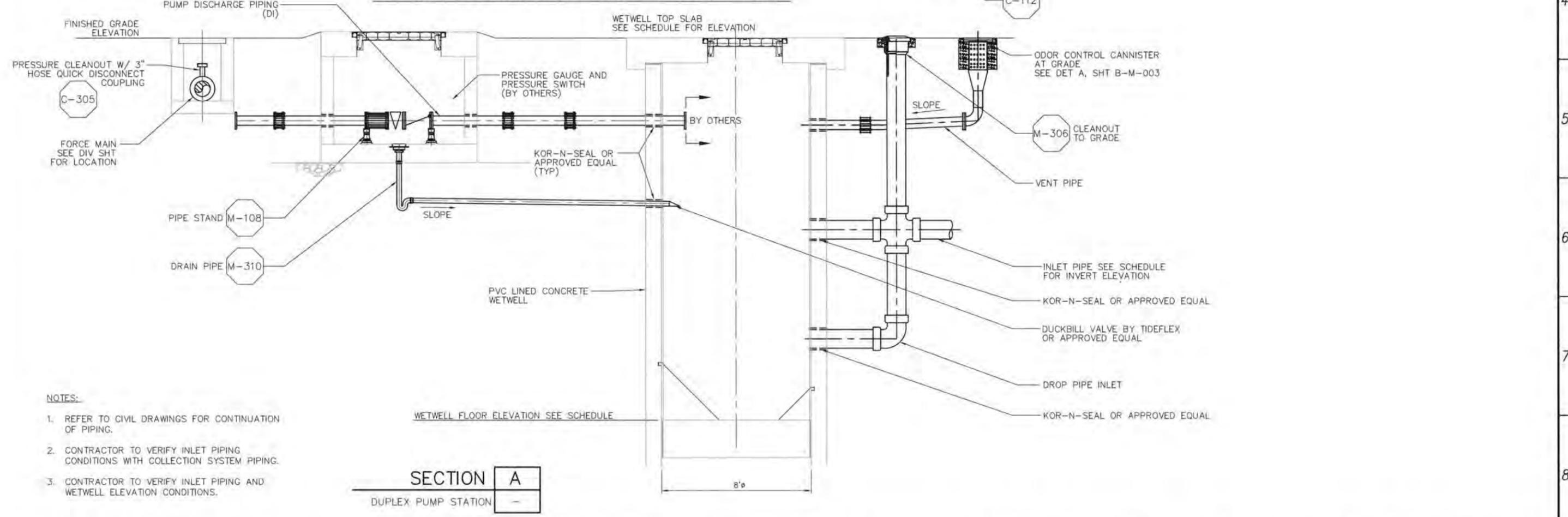
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A B C D E F G H I J K L



DUPLIX PUMP STATION SCHEDULE		
DESCRIPTION	SOLANO	LUPINE
AREA	B	B
TOP WETWELL SLAB ELEVATION (FT)	15.6	12.5
WETWELL FLOOR ELEVATION (FT)	-1.7	-9.7
WETWELL DEPTH (FT)	17.3	22.2
INLET PIPING SIZE (IN)	8	12
NUMBER OF INLETS	1	2
INLET PIPING INVERT ELEVATION (FT)	5.06	0.12
		-0.30
DISCHARGE PIPING SIZE (IN)	6	6
FORCE MAIN SIZE (IN)	6	8
FORCE MAIN CENTERLINE ELEVATION (FT)	12.4	8.5

DUPLIX SUBMERSIBLE PUMP STATION PLAN



- NOTES:**
- REFER TO CIVIL DRAWINGS FOR CONTINUATION OF PIPING.
 - CONTRACTOR TO VERIFY INLET PIPING CONDITIONS WITH COLLECTION SYSTEM PIPING.
 - CONTRACTOR TO VERIFY INLET PIPING AND WETWELL ELEVATION CONDITIONS.

SECTION A
DUPLIX PUMP STATION

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/01/12	LLB	MDM		ADDENDUM #1

DESIGNED BY: MPH
 DRAWN BY: JAW
 CHECKED BY: CCA
 DATE: APRIL 2012



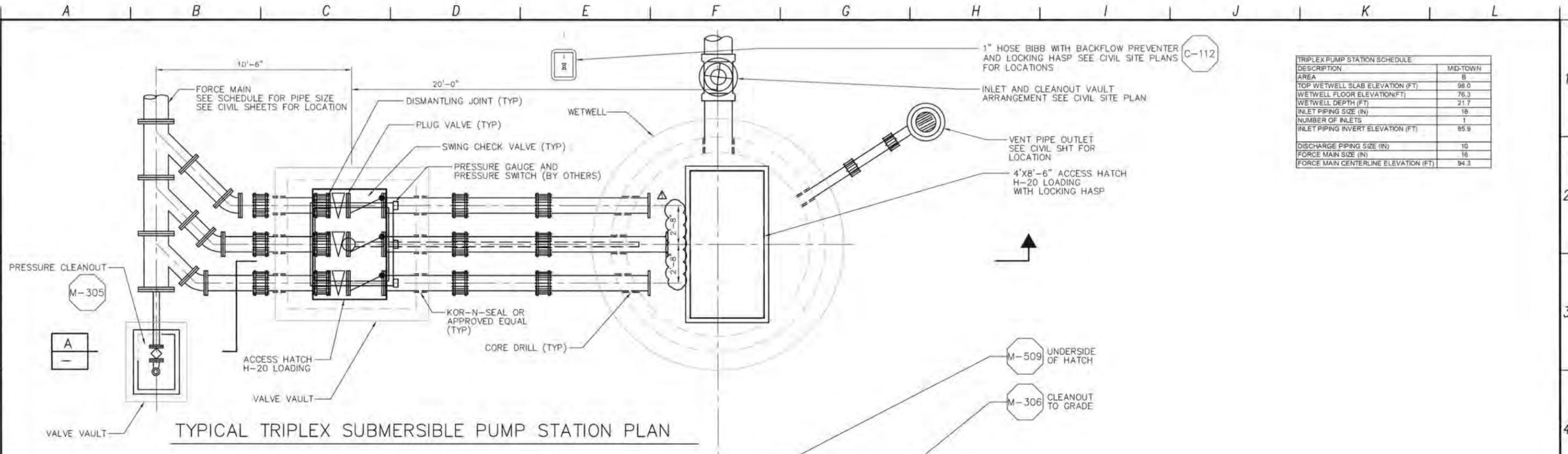
IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY



LOS OSOS WASTEWATER COLLECTION SYSTEM
MECHANICAL
SUBMERSIBLE PUMP STATIONS
DUPLIX LAYOUT - PLAN & SECTION

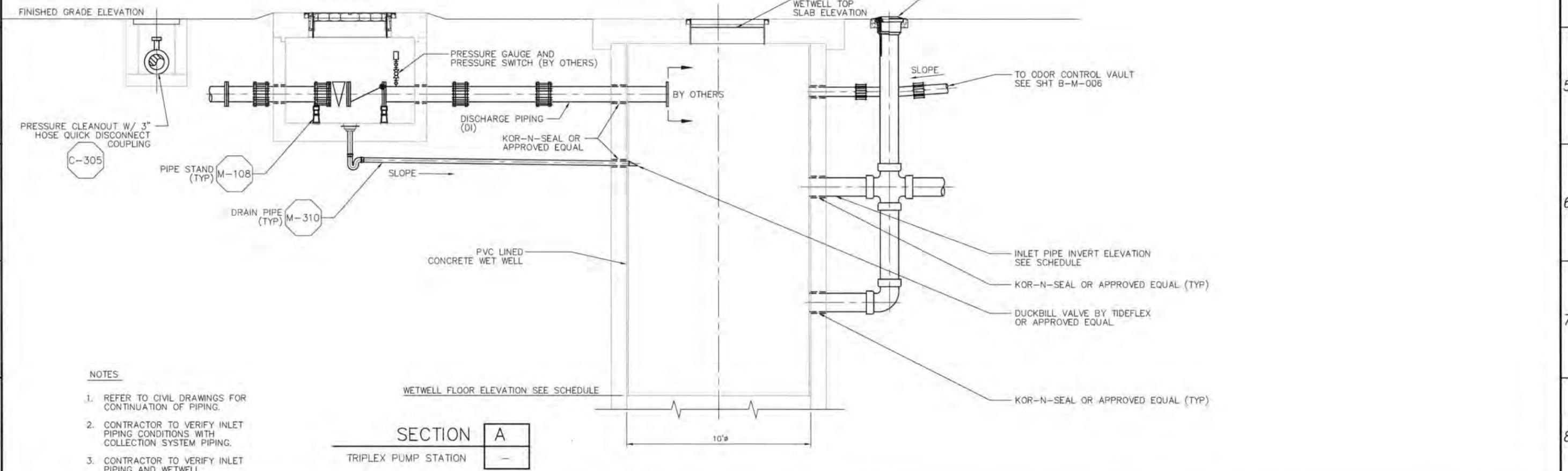
PROJECT NO. 42502-83120
 FILE NAME: B-M-004
 SHEET NO.
B-M-004

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TRIPLEX PUMP STATION SCHEDULE	
DESCRIPTION	MID-TOWN
AREA	B
TOP WETWELL SLAB ELEVATION (FT)	98.0
WETWELL FLOOR ELEVATION (FT)	76.3
WETWELL DEPTH (FT)	21.7
INLET PIPING SIZE (IN)	18
NUMBER OF INLETS	3
INLET PIPING INVERT ELEVATION (FT)	85.9
DISCHARGE PIPING SIZE (IN)	10
FORCE MAIN SIZE (IN)	16
FORCE MAIN CENTERLINE ELEVATION (FT)	94.3

TYPICAL TRIPLEX SUBMERSIBLE PUMP STATION PLAN



SECTION A
TRIPLEX PUMP STATION

NOTES

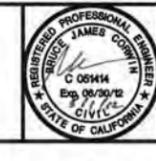
- REFER TO CIVIL DRAWINGS FOR CONTINUATION OF PIPING.
- CONTRACTOR TO VERIFY INLET PIPING CONDITIONS WITH COLLECTION SYSTEM PIPING.
- CONTRACTOR TO VERIFY INLET PIPING AND WETWELL ELEVATION CONDITIONS.

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	5/01/12	LLB	MDM	ADDENDUM #1

DESIGNED BY: MPH
 DRAWN BY: JAW
 CHECKED BY: CCA
 DATE: APRIL 2012



0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY



LOS OSOS WASTEWATER COLLECTION SYSTEM
MECHANICAL
 SUBMERSIBLE PUMP STATIONS
 TRIPLEX LAYOUT - PLAN & SECTION

PROJECT NO. 42502-B3120
 FILE NAME: B-M-005
 SHEET NO.
B-M-005

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POTHOLE DATA

AREA	POTHOLE DRAWING	EXISTING GRADE (FEET)	TOP ELEVATION (FEET)	EXISTING AC THICKNESS	LOCATION	DESCRIPTION	NORTHING	EASTING
C	80 C-PP-106	XXX.XX	156.63	X"	LOS OSOS VALLEY ROAD/S BAY BLVD	6" W	2,311,095.18	5,718,757.63
C	81 C-PP-105	XXX.XX	153.24	X"	LOS OSOS VALLEY ROAD/OCEANVIEW DR	4" COND	2,311,174.79	5,718,381.49
C	82 C-PP-105	XXX.XX	152.70	X"	LOS OSOS VALLEY ROAD/OCEANVIEW DR	4" COND	2,311,222.66	5,718,390.81
C	83 C-PP-105	XXX.XX	147.51 149.10	X"	LOS OSOS VALLEY ROAD/OCEANVIEW DR	1" G 4" COND	2,311,266.20	5,718,120.96
C	84 C-PP-105	XXX.XX	149.79	X"	LOS OSOS VALLEY ROAD/OCEANVIEW DR	4" COND	2,311,211.72	5,718,113.82
C	85 C-PP-105	XXX.XX	142.31	X"	LOS OSOS VALLEY ROAD/OCEANVIEW DR	5" COND	2,311,303.37	5,717,886.65
C	86 C-PP-105	XXX.XX	140.35	X"	LOS OSOS VALLEY ROAD/OCEANVIEW DR	8" W	2,311,309.09	5,717,843.11
C	87 C-PP-105	XXX.XX	139.74	X"	LOS OSOS VALLEY ROAD/OCEANVIEW DR	8" W	2,311,263.59	5,717,729.99
C	88 C-PP-104	XXX.XX	132.49	X"	LOS OSOS VALLEY ROAD/SUNSET DR	6" G	2,311,360.38	5,717,480.32
C	89 C-PP-104	XXX.XX	132.18	X"	LOS OSOS VALLEY ROAD/SUNSET DR	6" G	2,311,367.03	5,717,433.12
C	90 C-PP-104	XXX.XX	129.20	X"	LOS OSOS VALLEY ROAD/SUNSET DR	6" W	2,311,379.59	5,717,345.12
C	91 C-PP-104	XXX.XX	124.80	X"	LOS OSOS VALLEY ROAD/10TH ST	4" COND	2,311,472.51	5,716,812.01
			126.20			1.5" COND		
C	92 C-PP-104	127.70	122.80	X"	LOS OSOS VALLEY ROAD/10TH ST	12" FO COND	2,311,476.38	5,716,792.74
			124.77			8" W		
C	93 C-PP-104	XXX.XX	122.56	X"	LOS OSOS VALLEY ROAD/10TH ST	4" G	2,311,486.39	5,716,746.83
C	94 C-PP-103	XXX.XX	116.22	X"	LOS OSOS VALLEY ROAD/FERRELL AVE	4" FO COND	2,311,530.26	5,716,525.99
			117.27			4" G		
C	95 C-PP-103	XXX.XX	114.54	X"	LOS OSOS VALLEY ROAD/FERRELL AVE	4" G	2,311,546.15	5,716,543.36
			112.84			6" W		
C	96 C-PP-103	XXX.XX	105.48	X"	LOS OSOS VALLEY ROAD	4" G	2,311,740.30	5,715,686.38
			105.79			XX" FO		
			105.18			XX" G		
C	97 C-PP-102	XXX.XX	101.94	X"	LOS OSOS VALLEY ROAD/PALISADES AVE	2" G	2,311,783.50	5,715,509.44
			102.98			XX" FO		
			102.87			XX" FO		
C	98 C-PP-121	XXX.XX	107.54	X"	LOS OSOS VALLEY ROAD/BRODERSON AVE	4" G	2,312,095.77	5,713,527.05
C	99 C-PP-121	XXX.XX	105.86	X"	LOS OSOS VALLEY ROAD/BRODERSON AVE	FO COND	2,312,068.85	5,713,526.23
			106.36			8 or 10" W		

X = DATA NOT AVAILABLE

POTHOLE DATA

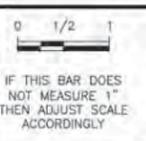
AREA	POTHOLE DRAWING	EXISTING GRADE (FEET)	TOP ELEVATION (FEET)	EXISTING AC THICKNESS	LOCATION	DESCRIPTION	NORTHING	EASTING
C	100 C-PP-121	XXX.XX	108.51	X"	LOS OSOS VALLEY ROAD/PINE AVE	3" G	2,312,123.94	5,713,047.38
C	101 C-PP-121	XXX.XX	106.78	X"	LOS OSOS VALLEY ROAD/PINE AVE	4" FO COND	2,312,121.68	5,713,020.99
C	102 C-PP-121	XXX.XX	107.97	X"	LOS OSOS VALLEY ROAD/PINE AVE	4" G	2,312,120.67	5,713,016.10
			107.38			6" W		
C	103 C-PP-151	XXX.XX	91.87	X"	LOS OSOS VALLEY ROAD/DORIS AVE	4" FO COND	2,312,179.82	5,711,883.71
C	104 C-PP-119	XXX.XX	115.34	X"	BRODERSON AVE/WOODLAND DR	2" G	2,311,789.22	5,713,513.15
C	105 C-PP-119	XXX.XX	114.93	X"	BRODERSON AVE/WOODLAND DR	6" W	2,311,781.38	5,713,515.84
C	106 C-PP-119	XXX.XX	128.07	X"	BRODERSON AVE/MANZANITA DR	8" W	2,311,477.62	5,713,506.08
C	107 C-PP-119	XXX.XX	142.31	X"	BRODERSON AVE/LILAC DR	2" G	2,311,241.38	5,713,496.67
C	108 C-PP-119	XXX.XX	142.21	X"	BRODERSON AVE/LILAC DR	6" W	2,311,216.00	5,713,496.37
C	109 C-PP-377	XXX.XX	156.95	X"	BRODERSON AVE/MAR VISTA DR	2" G	2,310,961.08	5,713,487.63
C	110 C-PP-377	XXX.XX	157.36	X"	BRODERSON AVE/MAR VISTA DR	6" W	2,310,930.76	5,713,486.19
C	111 C-PP-377	XXX.XX	173.81	X"	BRODERSON AVE/HIGHLAND DR	2" G	2,310,694.35	5,713,477.67
C	112 C-PP-377	XXX.XX	173.74	X"	BRODERSON AVE/HIGHLAND DR	8" W	2,310,669.15	5,713,478.60
C	113 C-PP-141	XXX.XX	162.46	X"	S BAY BLVD	1" G	2,310,918.66	5,718,712.97
C	114 C-PP-141	XXX.XX	170.10	X"	S BAY BLVD	2" G	2,310,792.19	5,718,609.02
C	115 C-PP-141	XXX.XX	172.51	X"	S BAY BLVD	1" G	2,310,707.11	5,718,533.64
C	116 C-PP-141	XXX.XX	173.24	X"	S BAY BLVD	8" W	2,310,670.15	5,718,490.35
C	117 C-PP-139	XXX.XX	126.88	X"	10TH ST	3" COND	2,311,837.00	5,716,789.06
C	118 C-PP-139	XXX.XX	128.07	X"	10TH ST	2" W	2,311,855.08	5,716,782.91

X = DATA NOT AVAILABLE

DESIGNED BY: BJC	DRAWN BY: LLB	CHECKED BY: RLA	DATE: APRIL 2012
REV. NO.	DATE	DRWN	CHKD
5/18/12	LLB	RLA	ADDENDUM #1
			REMARKS

DESIGNED BY: BJC
DRAWN BY: LLB
CHECKED BY: RLA
DATE: APRIL 2012

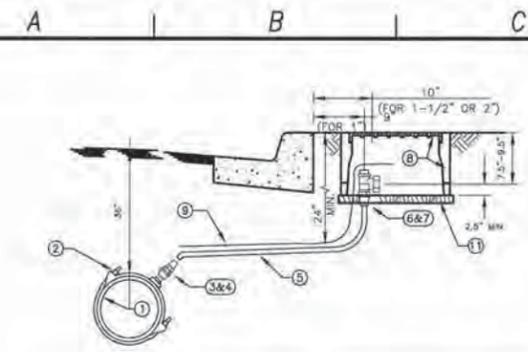
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Sacramento, CA 95833
Tel: (916) 567-9900



LOS OSOS WASTEWATER COLLECTION SYSTEM
GENERAL POTHOLE DATA - 2

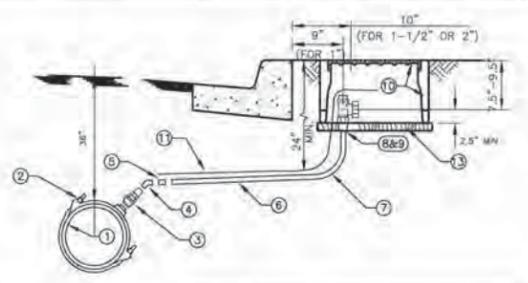
PROJECT NO. 42502-B3120
FILE NAME: C-G-009
SHEET NO.
C-G-009

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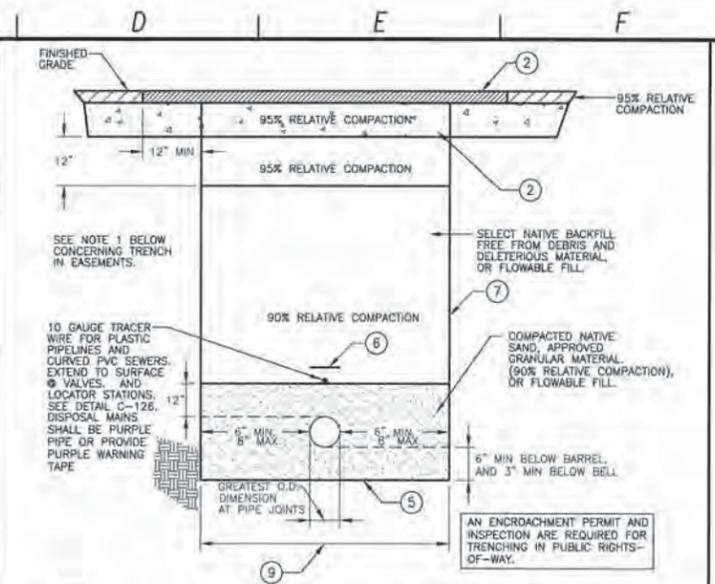
	3/4"
1 WATER MAIN	PER PLAN
2 SERVICE SADDLE	BRONZE, DOUBLE STRAP, JAMES JONES J-979 FOR AC PIPE, JAMES JONES J-969 FOR PVC PIPE OR APPROVED EQUAL
3 CORPORATION STOP	GROUNDKEY: JAMES JONES J-1944 1" SIZE ONLY, MIP X MIP #41
4 ADAPTER	1" FIP X INSTATITE, MUELLER H15456
5 SERVICE LATERAL	1" POLYETHYLENE ONLY IPS SIZE, 200 PSI MINIMUM, WESTFLEX GOLD LABEL 340B, DRISCOPE, OR APPROVED EQUAL.
6 ANGLE METER STOP (BALL TYPE)	JAMES JONES J-1527 (1"x1" OR 1"x 3/4")
7 ADAPTER	1" MIP X INSTATIGHT H15456
8 METER BOX AND LID	BROOKS 37 SERIES (TRAFFIC LID IN TRAFFIC AREA ONLY)
9	10 GAGE TRACER WIRE PER SPECIFICATIONS.
10	IN UNPAVED AREAS, RAISE METER BOX 1" ABOVE THE ADJACENT FINISHED SURFACE.
11	1" X 12" CONCRETE BASE
12	CUSTOMER SIDE CURB STOP - JONES J 1913W

SINGLE WATER SERVICE C-110



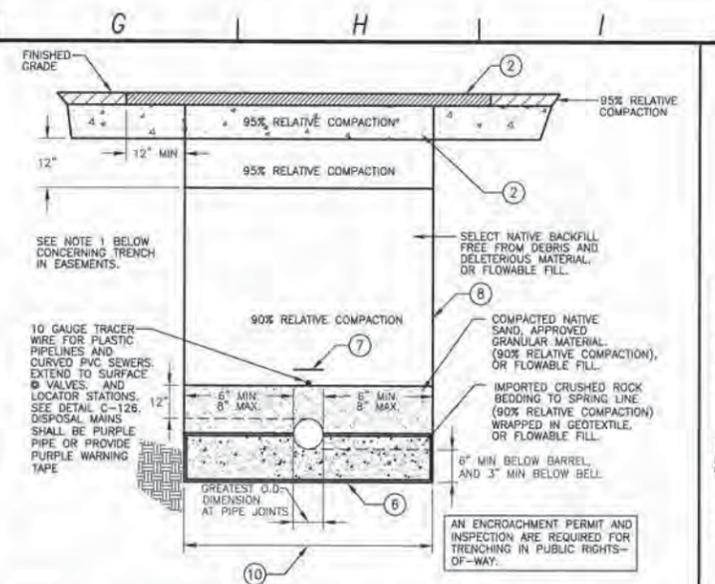
	1-1/2"
1 WATER MAIN	PER PLAN
2 SERVICE SADDLE	BRONZE, DOUBLE STRAP, JAMES JONES J-979 FOR AC PIPE, JAMES JONES J-969 FOR PVC PIPE OR APPROVED EQUAL
3 CORPORATION STOP	BALL VALVE: JAMES JONES J-1943 2" SIZE ONLY, MIP X MIP
4 BRASS 45° EL	2" 45° ELBOW ONLY
5 ADAPTER	FORD 2" PAC COUPLING X MIP
6 SERVICE LATERAL	2" SCH 80 PVC ONLY
7 90° ELBOW	2" SCH 80 90° ELBOW
8 ANGLE METER STOP (BALL TYPE)	FORD FB11027
9 ADAPTER	2" SCH 80 MIP X SOC
10 METER BOX AND LID	BROOKS 38 SERIES (TRAFFIC LID IF IN DRIVEWAY)
11	10 GAGE TRACER WIRE PER SPECIFICATIONS.
12	IN UNPAVED AREAS, RAISE METER BOX 1" ABOVE THE ADJACENT FINISHED SURFACE.
13	1" X 12" CONCRETE BASE
14	CUSTOMER SIDE CURB STOP - JF108

SINGLE WATER SERVICE C-111



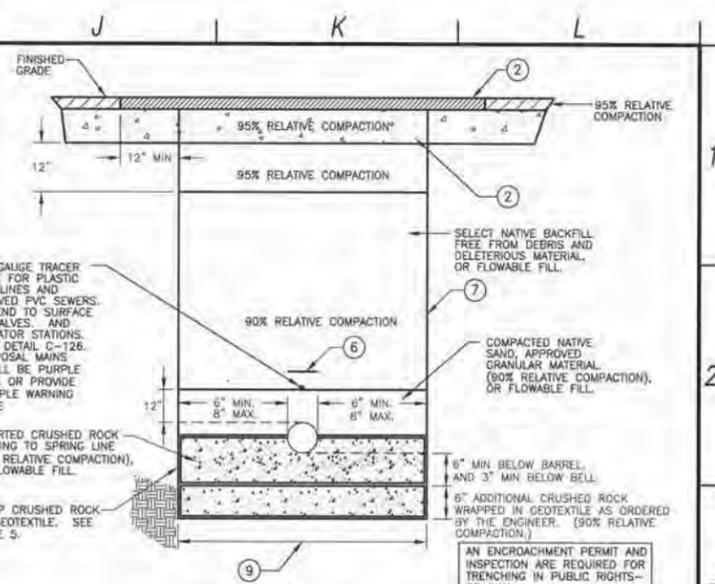
- NOTES:
- A MINIMUM OF 90% RELATIVE COMPACTION IS PERMITTED IN A NON-ROADWAY TRENCH WHEN NO STRUCTURES ARE TO BE BUILT OVER THE TRENCH. IF STRUCTURES ARE TO BE BUILT OVER THE TRENCH, USE RELATIVE COMPACTIONS SHOWN ON THE TRENCH SECTION ABOVE.
 - PAVEMENT SECTIONS SHALL BE NO LESS THAN EXISTING STRUCTURAL SECTIONS, AND AS REQUIRED BY THE COUNTY FOR TRENCHES WITHIN A COUNTY RIGHT-OF-WAY. SEE DETAIL C-120. SEE DETAIL C-116B FOR WET TRENCH SECTION.
 - A DRY TRENCH IS A TRENCH IN NON-GROUNDWATER AREAS.
 - WHERE THE BOTTOM OF THE TRENCH HAS BEEN DISTURBED, THE CONTRACTOR SHALL SCARIFY AND COMPACT THE SUBGRADE TO 90% RELATIVE COMPACTION.
 - 3" WIDE POLYETHYLENE NON-DETECTABLE WARNING TAPE 12" ABOVE ALL PIPE AND LATERALS.
 - VERTICAL TRENCH WALL DEPICTED, SHORING SHALL BE DESIGNED BY CONTRACTOR. TRENCH WALLS MAY BE SLOPED, CONTRACTOR SHALL COORDINATE TRENCH CONFIGURATION WITH OTHER GRAVITY, FORCEMAIN, RECYCLED WATER, AND CONDUIT PIPELINE TRENCH SECTIONS, AND CONFORM TO CULTURAL AND ENVIRONMENTAL RESTRICTIONS, THE TRAFFIC MANAGEMENT PLAN REQUIREMENTS, AND SHALL PROTECT EXISTING IMPROVEMENTS.
 - IF FLOWABLE FILL IS USED FOR BACKFILL, CONTRACTOR SHALL PROTECT AGAINST BUOYANT FORCE.
 - THIS DIMENSION AT PIPE SPRINGLINE, PLUS 24" FOR T-CUT, CONSTITUTES THE PAY LIMIT FOR AC AND AB REPLACEMENT, UNO IN TABLE 1 OF DETAIL C-120A

PIPELINE DRY TRENCH SECTION 10" AND SMALLER C-116



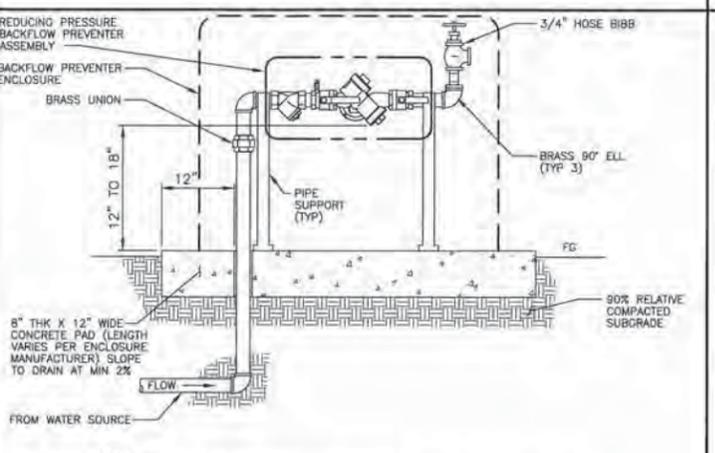
- NOTES:
- A MINIMUM OF 90% RELATIVE COMPACTION IS PERMITTED IN A NON-ROADWAY TRENCH WHEN NO STRUCTURES ARE TO BE BUILT OVER THE TRENCH. IF STRUCTURES ARE TO BE BUILT OVER THE TRENCH, USE RELATIVE COMPACTIONS SHOWN ON THE TRENCH SECTION ABOVE.
 - PAVEMENT SECTIONS SHALL BE NO LESS THAN EXISTING STRUCTURAL SECTIONS, AND AS REQUIRED BY THE COUNTY FOR TRENCHES WITHIN A COUNTY RIGHT-OF-WAY. SEE DETAIL C-120. SEE DETAIL C-116B FOR WET TRENCH SECTION.
 - A DRY TRENCH IS A TRENCH IN NON-GROUNDWATER AREAS.
 - ENDS OF GEOTEXTILE SHALL TOUCH PIPE BARREL. GEOTEXTILE MAY BE LAPPED UNDER PIPE IF DESIRED.
 - WHERE THE BOTTOM OF THE TRENCH HAS BEEN DISTURBED, THE CONTRACTOR SHALL SCARIFY AND COMPACT THE SUBGRADE TO 90% RELATIVE COMPACTION.
 - 3" WIDE POLYETHYLENE NON-DETECTABLE WARNING TAPE 12" ABOVE ALL PIPE AND LATERALS.
 - VERTICAL TRENCH WALL DEPICTED, SHORING SHALL BE DESIGNED BY CONTRACTOR. TRENCH WALLS MAY BE SLOPED, CONTRACTOR SHALL COORDINATE TRENCH CONFIGURATION WITH OTHER GRAVITY, FORCEMAIN, RECYCLED WATER, AND CONDUIT PIPELINE TRENCH SECTIONS, AND CONFORM TO CULTURAL AND ENVIRONMENTAL RESTRICTIONS, THE TRAFFIC MANAGEMENT PLAN REQUIREMENTS, AND SHALL PROTECT EXISTING IMPROVEMENTS.
 - IF FLOWABLE FILL IS USED FOR BACKFILL, CONTRACTOR SHALL PROTECT AGAINST BUOYANT FORCE.
 - THIS DIMENSION AT PIPE SPRINGLINE, PLUS 24" FOR T-CUT, CONSTITUTES THE PAY LIMIT FOR AC AND AB REPLACEMENT, UNO IN TABLE 1 OF DETAIL C-120A

PIPELINE DRY TRENCH SECTION 12" AND LARGER C-116A



- NOTES:
- A MINIMUM OF 90% RELATIVE COMPACTION IS PERMITTED IN A NON-ROADWAY TRENCH WHEN NO STRUCTURES ARE TO BE BUILT OVER THE TRENCH. IF STRUCTURES ARE TO BE BUILT OVER THE TRENCH, USE RELATIVE COMPACTIONS SHOWN ON THE TRENCH SECTION ABOVE.
 - PAVEMENT SECTIONS SHALL BE NO LESS THAN EXISTING STRUCTURAL SECTIONS, AND AS REQUIRED BY THE COUNTY FOR TRENCHES WITHIN A COUNTY RIGHT-OF-WAY. SEE DETAIL C-120. SEE DETAILS C-116 AND C-116A FOR DRY TRENCH SECTIONS.
 - A WET TRENCH IS A TRENCH IN GROUNDWATER AREAS BUT HAS BEEN DEWATERED IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS.
 - ENDS OF GEOTEXTILE SHALL TOUCH PIPE BARREL. GEOTEXTILE MAY BE LAPPED UNDER PIPE IF DESIRED.
 - 3" WIDE POLYETHYLENE NON-DETECTABLE WARNING TAPE 12" ABOVE ALL PIPE AND LATERALS.
 - VERTICAL TRENCH WALL DEPICTED, SHORING SHALL BE DESIGNED BY CONTRACTOR. TRENCH WALLS MAY BE SLOPED, CONTRACTOR SHALL COORDINATE TRENCH CONFIGURATION WITH OTHER GRAVITY, FORCEMAIN, RECYCLED WATER, AND CONDUIT PIPELINE TRENCH SECTIONS, AND CONFORM TO CULTURAL AND ENVIRONMENTAL RESTRICTIONS, THE TRAFFIC MANAGEMENT PLAN REQUIREMENTS, AND SHALL PROTECT EXISTING IMPROVEMENTS.
 - IF FLOWABLE FILL IS USED FOR BACKFILL, CONTRACTOR SHALL PROTECT AGAINST BUOYANT FORCE.
 - THIS DIMENSION AT PIPE SPRINGLINE, PLUS 24" FOR T-CUT, CONSTITUTES THE PAY LIMIT FOR AC AND AB REPLACEMENT, UNO IN TABLE 1 OF DETAIL C-120A

PIPELINE WET TRENCH SECTION ALL DIAMETERS C-116B



- NOTES:
- EQUIPMENT TO BE INSTALLED AT A MINIMUM OF 24" FROM ANY STRUCTURES OR HARDSCAPING.
 - WHEN UNIT IS NEXT TO A STRUCTURE (I.E. WALL, BUILDING, ETC.) MOUNT TEST COCKS ON OPEN OR NON-STRUCTURE SIDE.
 - ABOVE GROUND PIPE TO BE COPPER.

BACKFLOW PREVENTER WITH HOSE BIBB AND ENCLOSURE C-112 NOT TO SCALE

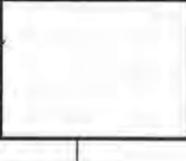
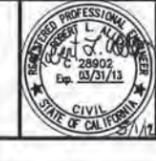
DESIGNED BY:	BJC			
DRAWN BY:	JAW			
CHECKED BY:	MDM			
DATE:	APRIL 2012			
REV. NO.	DATE	DRWN	CHKD	REMARKS:
1	5/01/12	LLB	MDM	ADDENDUM #1

DESIGNED BY: BJC
 DRAWN BY: JAW
 CHECKED BY: MDM
 DATE: APRIL 2012

CDM Smith
 2295 Gateway Oaks Drive, Suite 240
 Sacramento, CA 95833
 Tel: (916) 567-9900



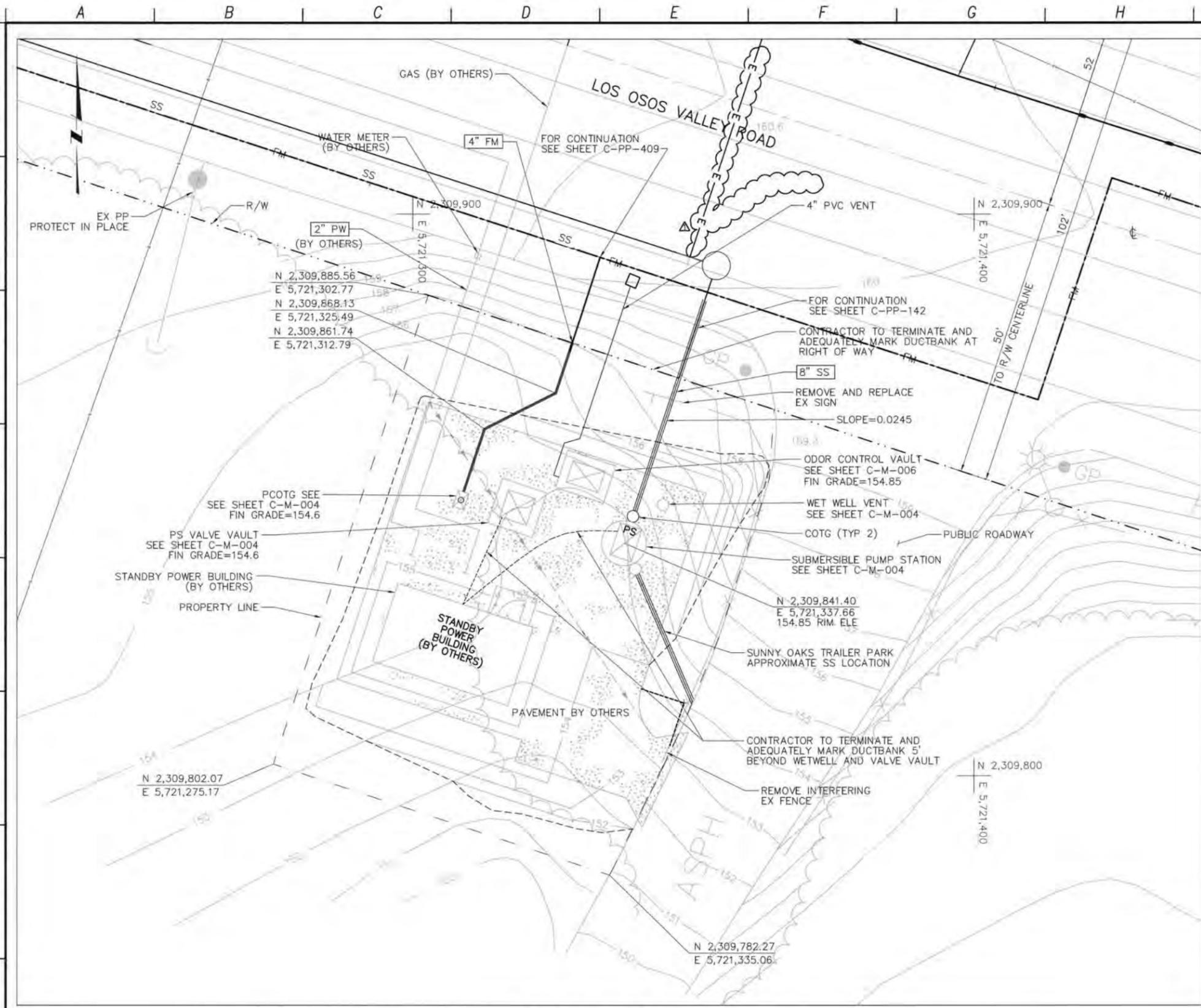
IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY



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LOS OSOS WASTEWATER COLLECTION SYSTEM
 PROJECT NO. 42502-83120
 FILE NAME: C-GC-061
 SHEET NO. C-GC-061
GENERAL CIVIL STANDARD CIVIL DETAILS - 2

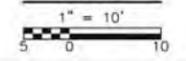
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- NOTES:**
- LIDS AND VAULTS TO BE TRAFFIC RATED FOR H-20 LOADING
 - COORDINATE ELECTRICAL DUCTBANK DEPTH AND LOCATION BEFORE INSTALLATION OF PROCESS PIPING. SEE SHEET C-PP-409.
 - CONTRACTOR SHALL NOTIFY SUNNY OAKS MOBILE HOME PARK AT LEAST 30 DAYS IN ADVANCE BY US MAIL OF ANY CONSTRUCTION ACTIVITIES AT THE SUNNY OAKS PS SITE. CONSTRUCTION ACTIVITIES SHALL BE CONDUCTED IN A MANNER TO MAINTAIN DRIVEWAY INGRESS AND EGRESS TO THE MOBILE HOME PARK AT ALL TIMES. THE CONTRACTORS ACCESS TO THE SITE SHALL BE DEVELOPED FROM LOS OSOS VALLEY ROAD AND SHALL NOT UTILIZE THE MOBILE HOME PARK DRIVEWAY.
 - CONTRACTOR MAY TEMPORARILY REMOVE THE SUNNY OAKS MOBILE HOME PARK ENTRANCE SIGN AND ASSOCIATED LIGHTING FOR THE DURATION OF CONSTRUCTION ACTIVITIES. IF REMOVED, THE SIGN AND LIGHTING SHALL BE RESTORED TO ORIGINAL CONDITION AFTER CONSTRUCTION ACTIVITIES ARE COMPLETED.
 - ALL SURFACE IMPROVEMENTS SHOWN HERE NOT ASSOCIATED WITH BURIED PUMP STATION AND VALVE VAULT (AND NOT SHOWN ON C-M-004) ARE TO BE CONSTRUCTED BY OTHERS AND ARE ONLY SHOWN FOR REFERENCE.
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUIT AND MANHOLES ALONG PIPELINE.

SUNNY OAKS PUMP STATION

PLAN



REV. NO.	DATE	DRWN	CHKD	REMARKS
1	5/24/12	LLB	RLA	ADDENDUM #2

DESIGNED BY: MPH
 DRAWN BY: JAW
 CHECKED BY: CCA
 DATE: APRIL 2012

CDM Smith
 2295 Gateway Oaks Drive, Suite 240
 Sacramento, CA 95833
 Tel: (916) 567-9900



IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY



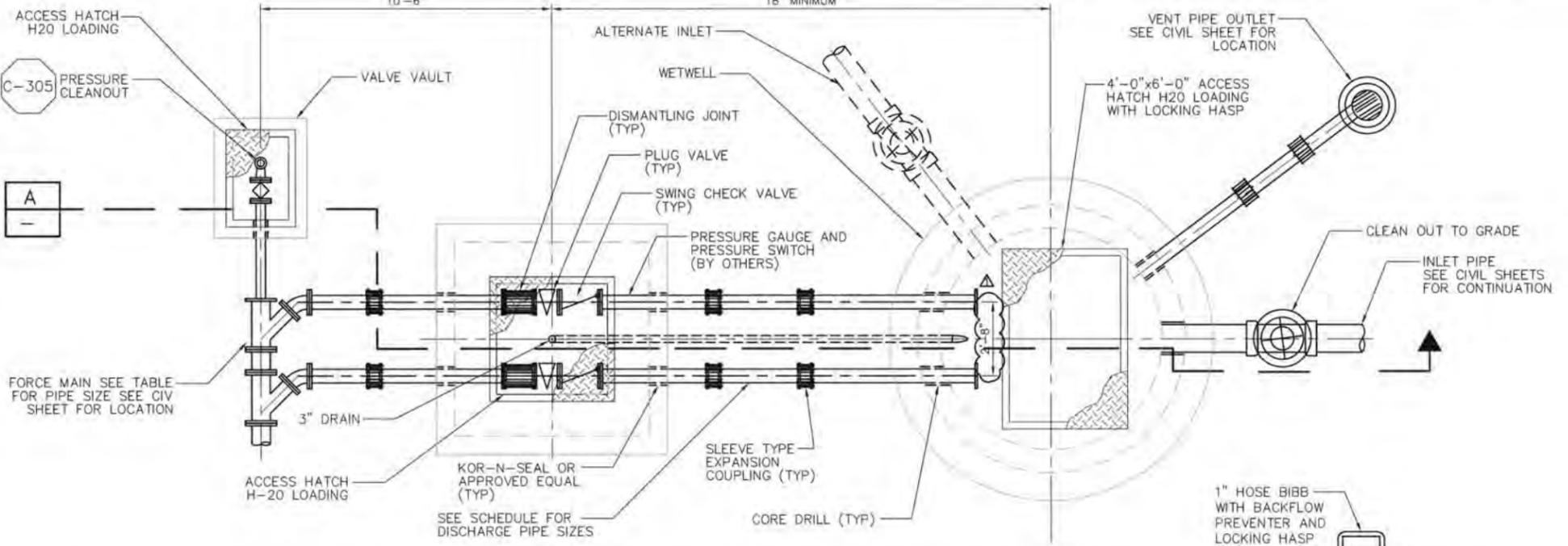
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 UNDERGROUND SERVICE ALERT OF NORTHERN CALIFORNIA

LOS OSOS WASTEWATER COLLECTION SYSTEM
 CIVIL
SUNNY OAKS PS & STANDBY POWER SITE PLAN

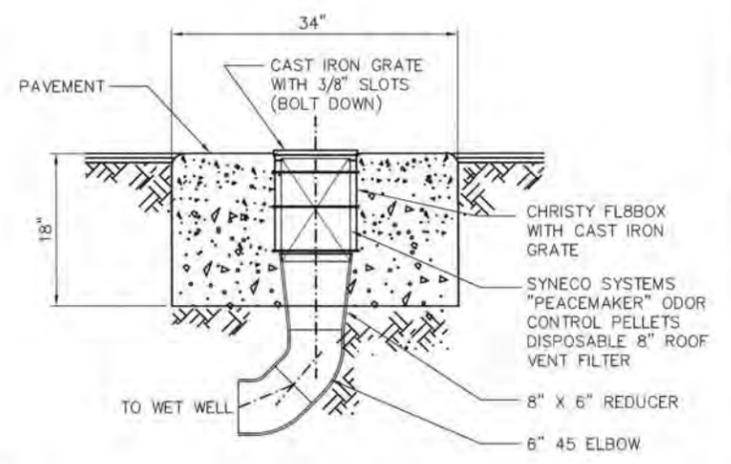
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 FILE NAME: C-C-302
 SHEET NO.
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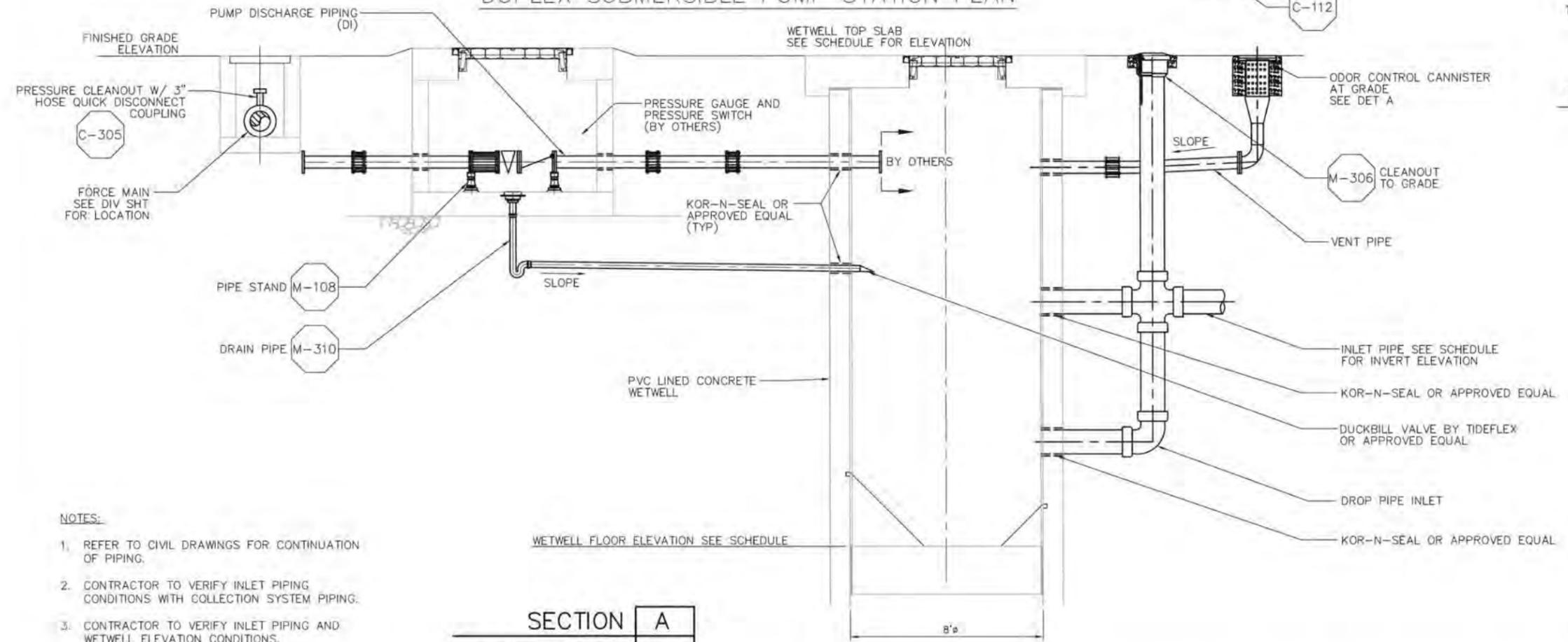
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DUPLIX PUMP STATION SCHEDULE	
DESCRIPTION	SUNNY OAKS
AREA	C
TOP WETWELL SLAB ELEVATION (FT)	154.85
WETWELL FLOOR ELEVATION (FT)	146.5
WETWELL DEPTH (FT)	8.3
INLET PIPING SIZE (IN)	8
NUMBER OF INLETS	1
INLET PIPING INVERT ELEVATION (FT)	151.35
DISCHARGE PIPING SIZE (IN)	4
FORCE MAIN SIZE (IN)	4
FORCE MAIN CENTERLINE ELEVATION (FT)	151.5



DUPLIX SUBMERSIBLE PUMP STATION PLAN



ODOR CONTROL CANNISTER DETAIL

- NOTES:**
- REFER TO CIVIL DRAWINGS FOR CONTINUATION OF PIPING.
 - CONTRACTOR TO VERIFY INLET PIPING CONDITIONS WITH COLLECTION SYSTEM PIPING.
 - CONTRACTOR TO VERIFY INLET PIPING AND WETWELL ELEVATION CONDITIONS.

SECTION A
DUPLIX PUMP STATION

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/01/12	LLB	MDM		ADDENDUM #1

DESIGNED BY: MPH
 DRAWN BY: JAW
 CHECKED BY: CCA
 DATE: APRIL 2012



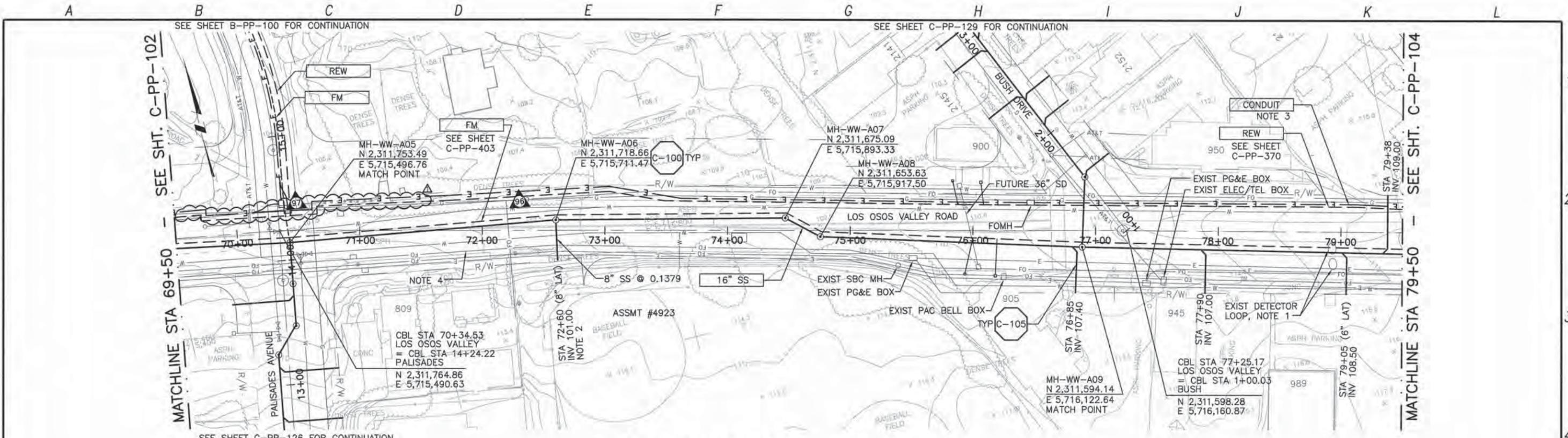
IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY



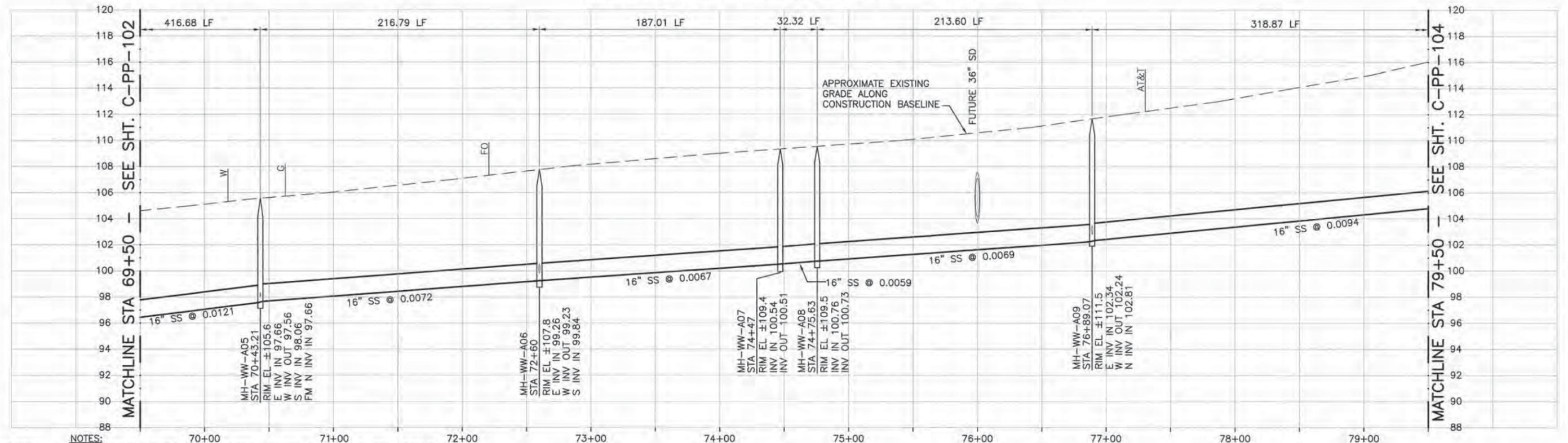
LOS OSOS WASTEWATER COLLECTION SYSTEM
MECHANICAL SUBMERSIBLE PUMP STATIONS
 DUPLEX LAYOUT - PLAN & SECTION

PROJECT NO. 42502-83120
 FILE NAME: C-M-004
 SHEET NO. C-M-004

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PLAN ON LOS OSOS VALLEY ROAD



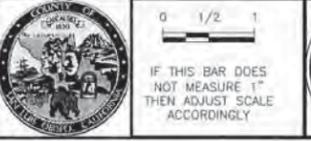
PROFILE ON LOS OSOS VALLEY ROAD

- NOTES:
- CONTRACTOR SHALL REPAIR EXISTING TRAFFIC CONTROL SYSTEM, INCLUDING INSTALLING NEW DETECTOR LOOPS, WHERE CONSTRUCTION RESULTS IN DAMAGE TO EXISTING SYSTEM. CONTRACTOR SHALL COORDINATE REPAIRS WITH COUNTY OF SAN LUIS OBISPO.
 - CONTRACTOR SHALL CAP END OF STUB SS AND STAKE FOR FUTURE CONNECTION.
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUIT AND MANHOLES ALONG THE PIPELINE.
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: KS
 DRAWN BY: RKU
 CHECKED BY: RLA
 DATE: APRIL 2012

CDM Smith
 2295 Gateway Oaks Drive, Suite 240
 Sacramento, CA 95833
 Tel: (916) 567-9900

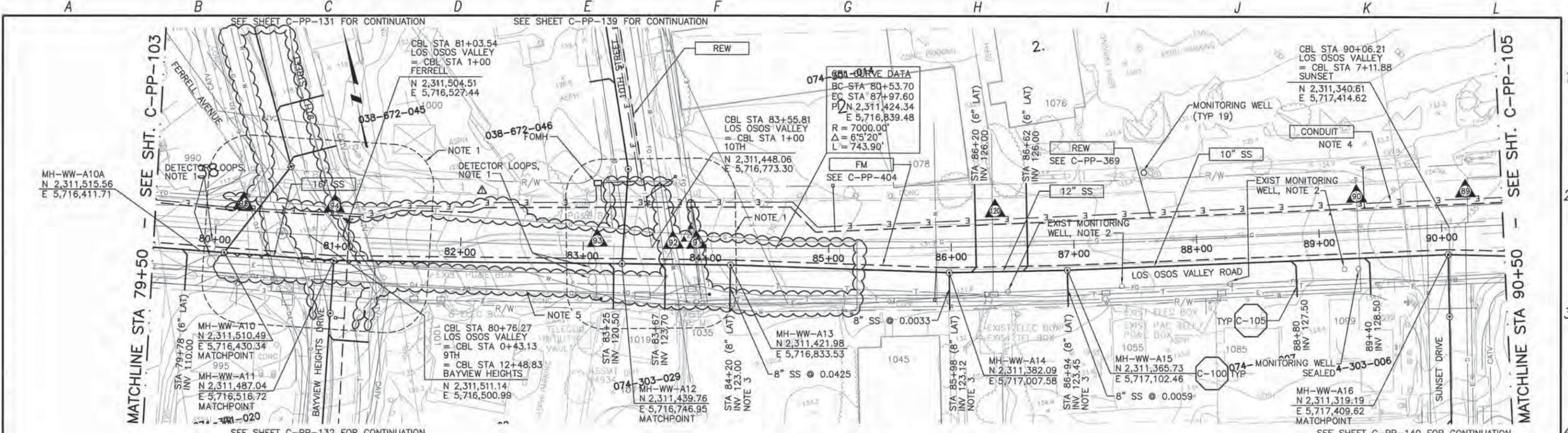


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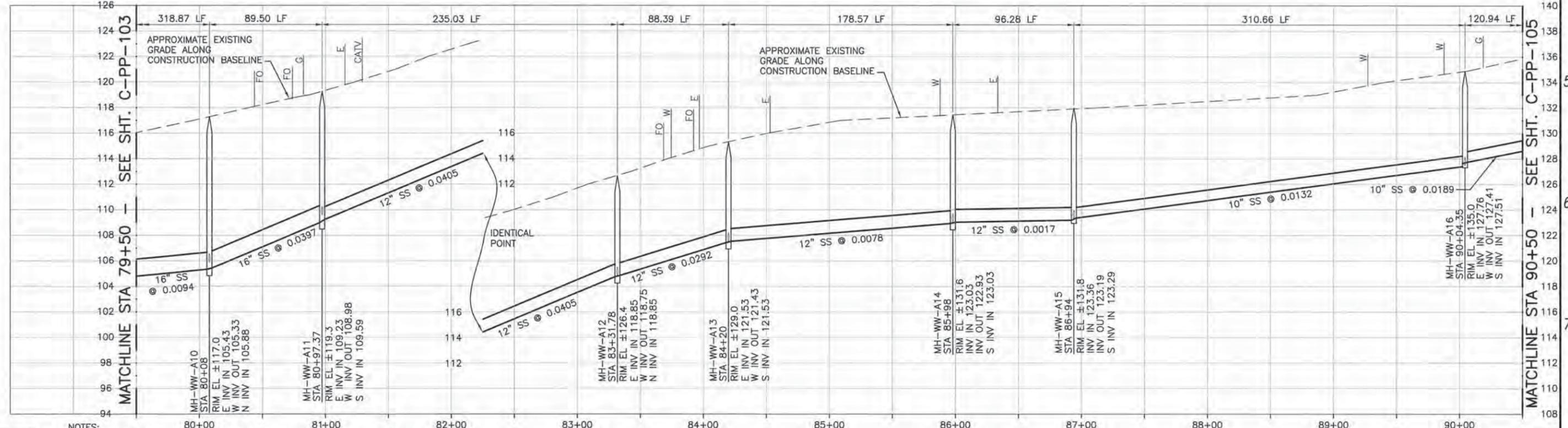
LOS OSOS WASTEWATER COLLECTION SYSTEM
PLAN AND PROFILE
 LOS OSOS VALLEY ROAD
 STA 69+50 TO STA 79+50

PROJECT NO. 42502-83120
 FILE NAME: C-PP-103
 SHEET NO.
C-PP-103

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PLAN ON LOS OSOS VALLEY ROAD

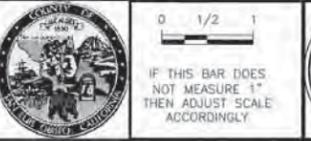


PROFILE ON LOS OSOS VALLEY ROAD

- NOTES:**
- CONTRACTOR SHALL REPAIR EXISTING TRAFFIC CONTROL SYSTEM, INCLUDING INSTALLING NEW DETECTOR LOOPS, WHERE CONSTRUCTION RESULTS IN DAMAGE TO EXISTING SYSTEM. CONTRACTOR SHALL COORDINATE REPAIRS WITH COUNTY OF SAN LUIS OBISPO.
 - NOT ALL MONITORING WELLS ARE SHOWN.
 - CONTRACTOR SHALL CAP END OF STUB SS AND STAKE FOR FUTURE CONNECTION.
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUIT AND MANHOLES ALONG THE PIPELINE.
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

DESIGNED BY:	KS
DRAWN BY:	RKU
CHECKED BY:	RLA
DATE:	APRIL 2012

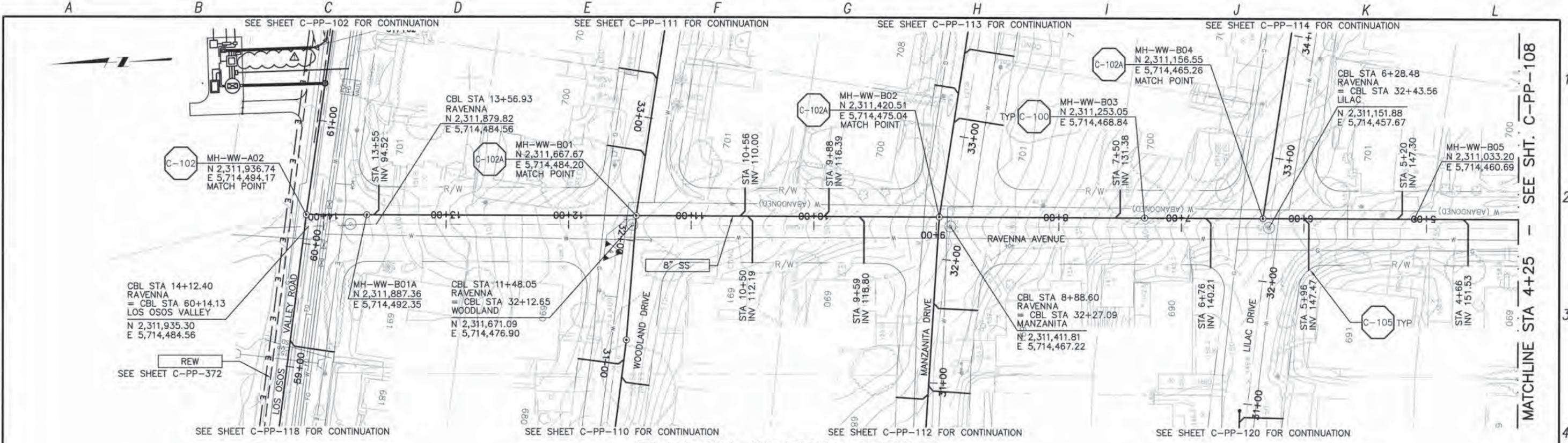
CDM
Smith
 2295 Gateway Oaks Drive, Suite 240
 Sacramento, CA 95833
 Tel: (916) 967-9900



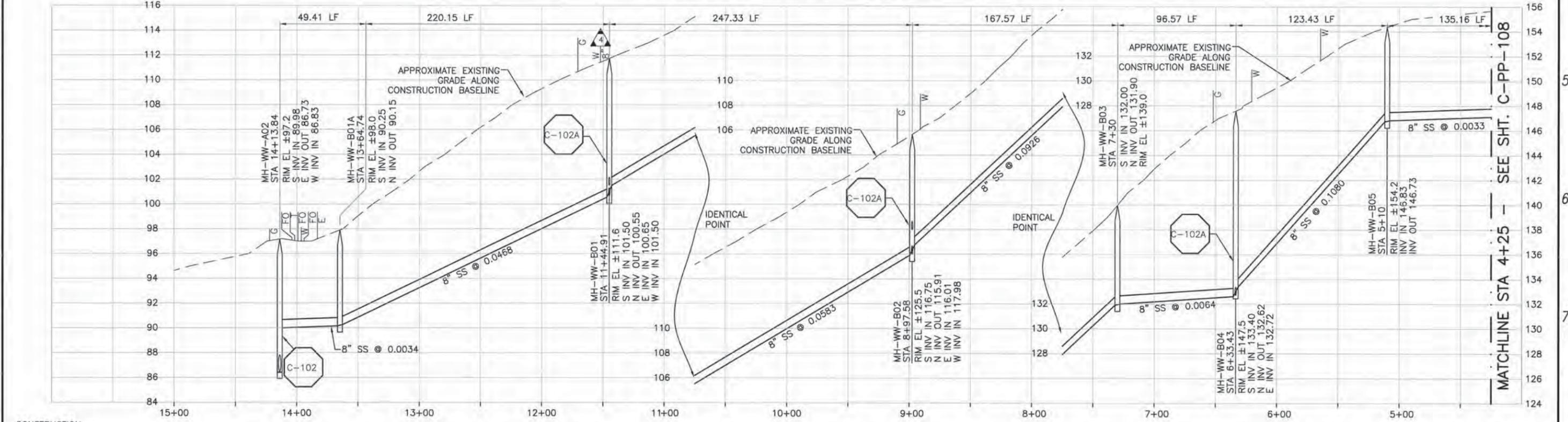
LOS OSOS WASTEWATER COLLECTION SYSTEM
PLAN AND PROFILE
 LOS OSOS VALLEY ROAD
 STA 79+50 TO STA 90+50

PROJECT NO.	42502-83120
FILE NAME	C-PP-104
SHEET NO.	C-PP-104

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PLAN ON RAVENNA AVENUE



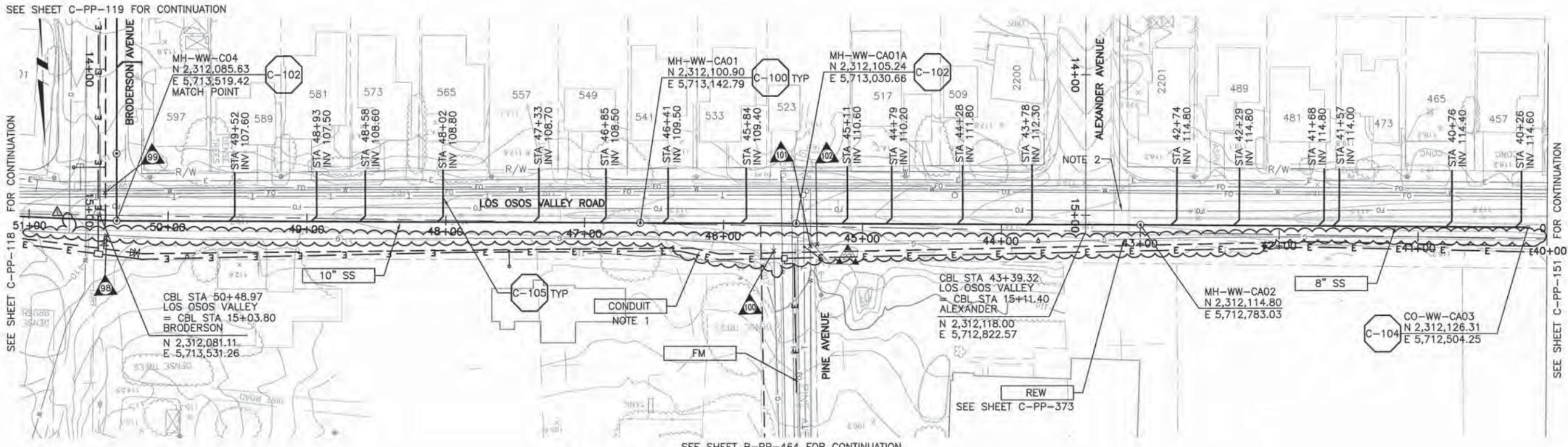
PROFILE ON RAVENNA AVENUE

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/24/12	LLB	RLA		ADDENDUM #2

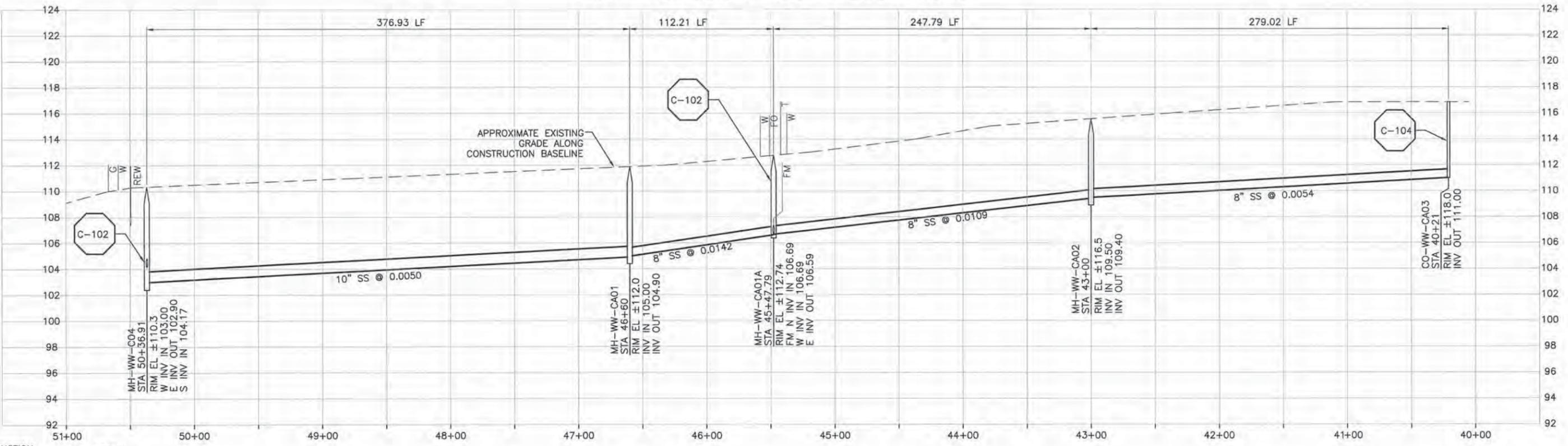
DESIGNED BY: KS	<p>2295 Gateway Oaks Drive, Suite 240 Sacramento, CA 95833 Tel: (916) 567-9900</p>			<p>DIAL TOLL FREE 1-800-642-2444 AT LEAST TWO DAYS BEFORE YOU DIG UNDERGROUND SERVICE ALERT OF NORTHERN CALIFORNIA</p>	LOS OSOS WASTEWATER COLLECTION SYSTEM PLAN AND PROFILE RAVENNA AVENUE STA 14+13.84 TO STA 4+25	PROJECT NO. 42502-B3120
DRAWN BY: RKU						FILE NAME: C-PP-107
CHECKED BY: RLA						SHEET NO.
DATE: APRIL 2012						C-PP-107

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

- CONSTRUCTION BASELINE STATION
- NOTES:
- REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS
 DRAWN BY: RKU
 CHECKED BY: RLA
 DATE: APRIL 2012

CDM Smith
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 Sacramento, CA 95833
 Tel: (916) 567-9900



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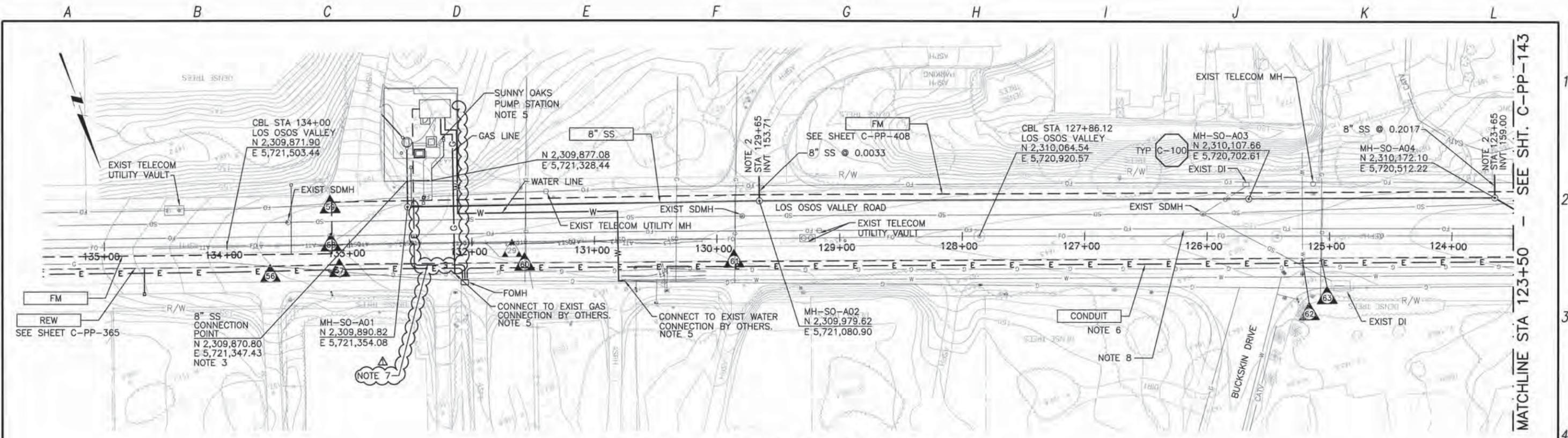


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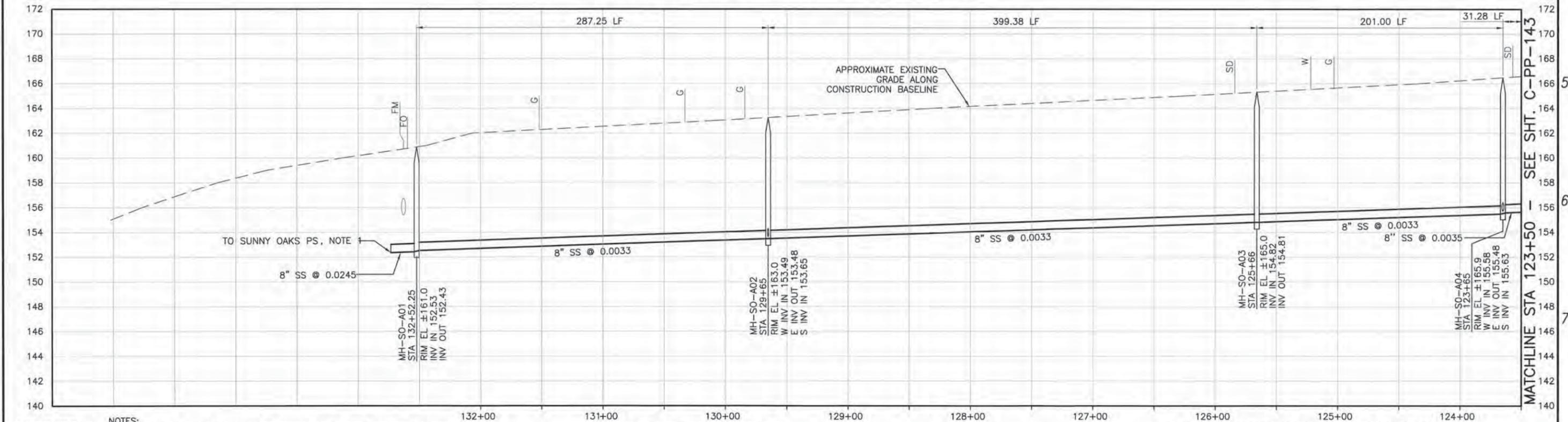
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE
 LOS OSOS VALLEY ROAD
 STA 50+36.91 TO STA 40+21

PROJECT NO. 42502-83120
 FILE NAME: C-PP-121
 SHEET NO.
C-PP-121

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PLAN ON LOS OSOS VALLEY ROAD



- NOTES:**
- CONTRACTOR SHALL CONNECT TO SUNNY OAKS PUMP STATION, VERIFY CONNECTION LOCATION AND DEPTH PRIOR TO BEGINNING WORK. SEE SHEET C-C-302 FOR DETAILS.
 - CONTRACTOR SHALL CAP END OF STUB SS AND STAKE FOR FUTURE CONNECTION.
 - SUNNY OAKS TRAILER PARK SEWER CONNECTION IS DIRECT TO PUMP STATION. SEE SHEET C-C-302 FOR DETAILS.
 - E(OH) ON NORTH SIDE OF STREET.
 - SEE SHEET C-C-302 FOR DETAILS.
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 - TERMINATE CONDUITS AT PROPERTY LINE. MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

PROFILE ON LOS OSOS VALLEY ROAD

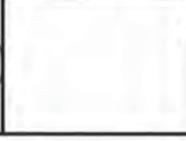
DESIGNED BY:	KS
DRAWN BY:	RKU
CHECKED BY:	RLA
DATE:	APRIL 2012

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/24/12	LLB	RLA		ADDENDUM #2

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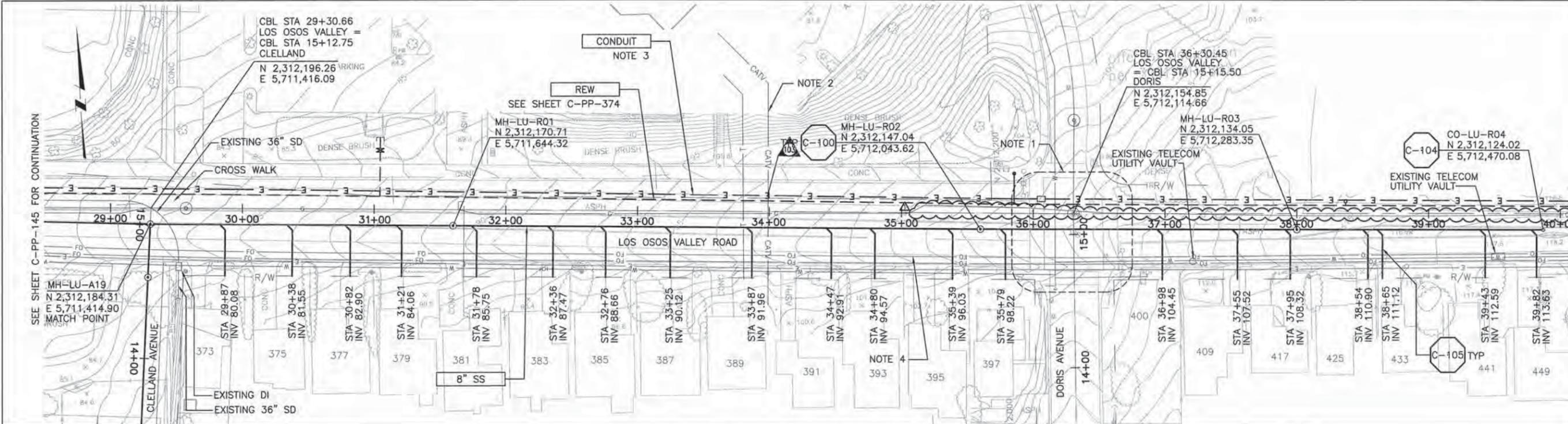


LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE
 LOS OSOS VALLEY ROAD
 STA 132+52.25 TO STA 123+50

PROJECT NO. 42502-83120	FILE NAME: C-PP-142
SHEET NO. C-PP-142	

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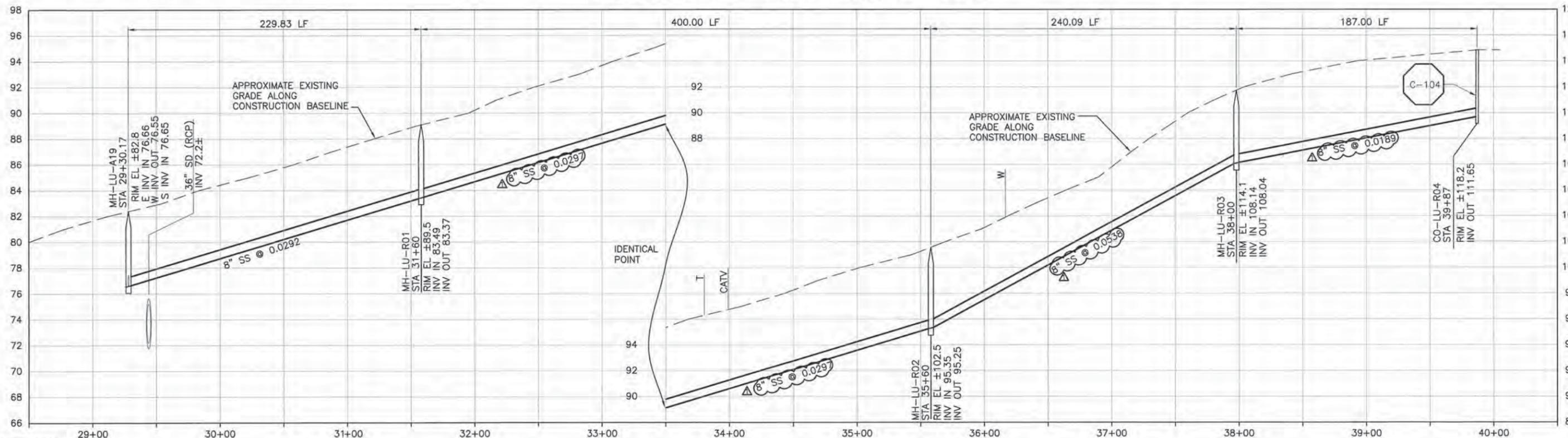
A B C D E F G H I J K L



SEE SHEET C-PP-145 FOR CONTINUATION

SEE SHEET C-PP-121 FOR CONTINUATION

PLAN ON LOS OSOS VALLEY ROAD



NOTES:

- CONTRACTOR SHALL REPAIR EXISTING TRAFFIC CONTROL SYSTEM, INCLUDING INSTALLING NEW DETECTOR LOOPS, WHERE CONSTRUCTION RESULTS IN DAMAGE TO EXISTING SYSTEM. CONTRACTOR SHALL COORDINATE REPAIRS WITH COUNTY OF SAN LUIS OBISPO.
- CONTRACTOR TO VERIFY DEPTH OF CATV FACILITY.
- REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
- MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

PROFILE ON LOS OSOS VALLEY ROAD

SCALE:
HORIZ: 1"=40'
VERT: 1"=4'

DESIGNED BY:	KS
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CHECKED BY:	RLA
DATE:	APRIL 2012

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS
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 CHECKED BY: RLA
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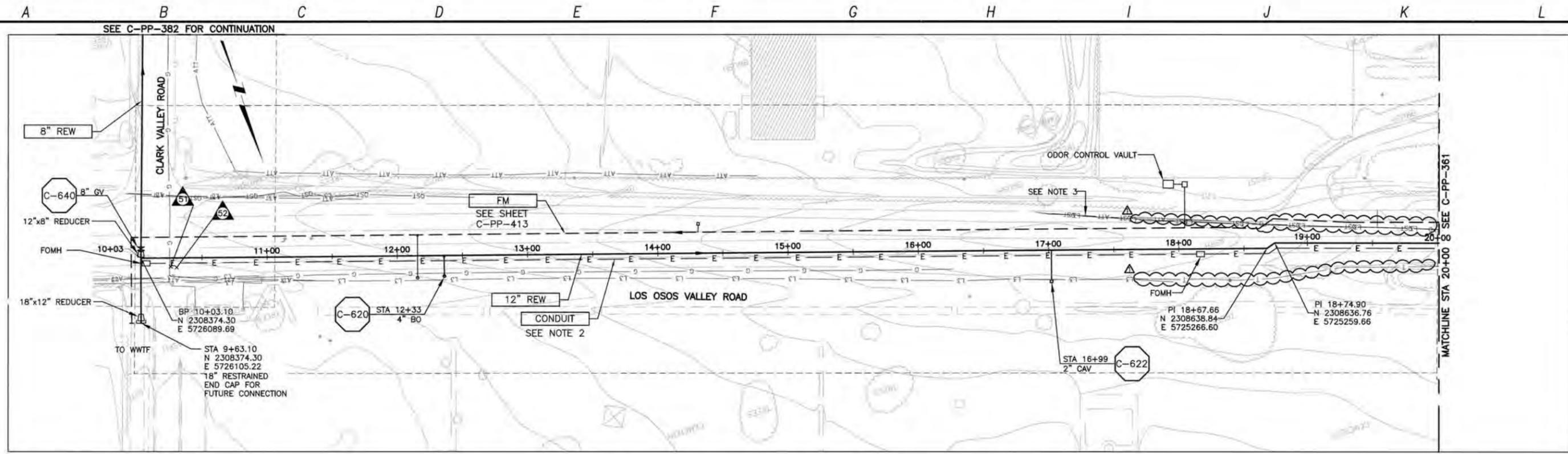


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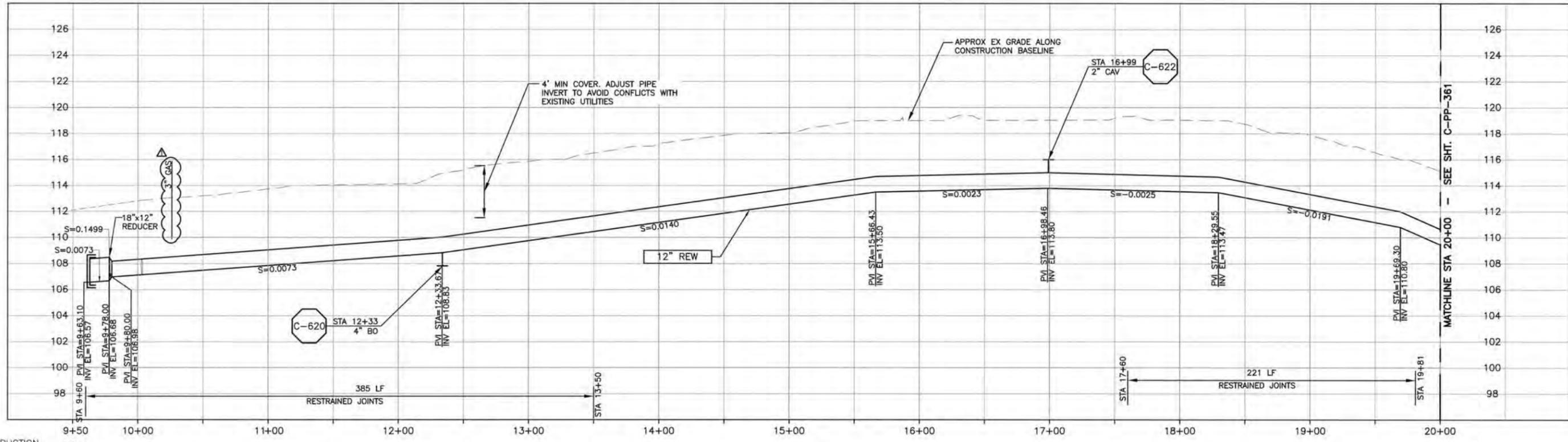
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE
 LOS OSOS VALLEY ROAD
 STA 29+30.17 TO STA 39+87

PROJECT NO. 42502-83120
 FILE NAME: C-PP-151
 SHEET NO.
C-PP-151

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PLAN ON LOS OSOS VALLEY ROAD



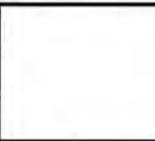
PROFILE ON LOS OSOS VALLEY ROAD

- CONSTRUCTION BASELINE STATION
- NOTES
1. NOMINAL REW FORCE MAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 14".
 2. REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 3. MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

DESIGNED BY:	KS, RLA
DRAWN BY:	RKU
CHECKED BY:	BJC
DATE:	APRIL 2012

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	5/18/12	LLB	RLA	ADDENDUM #1

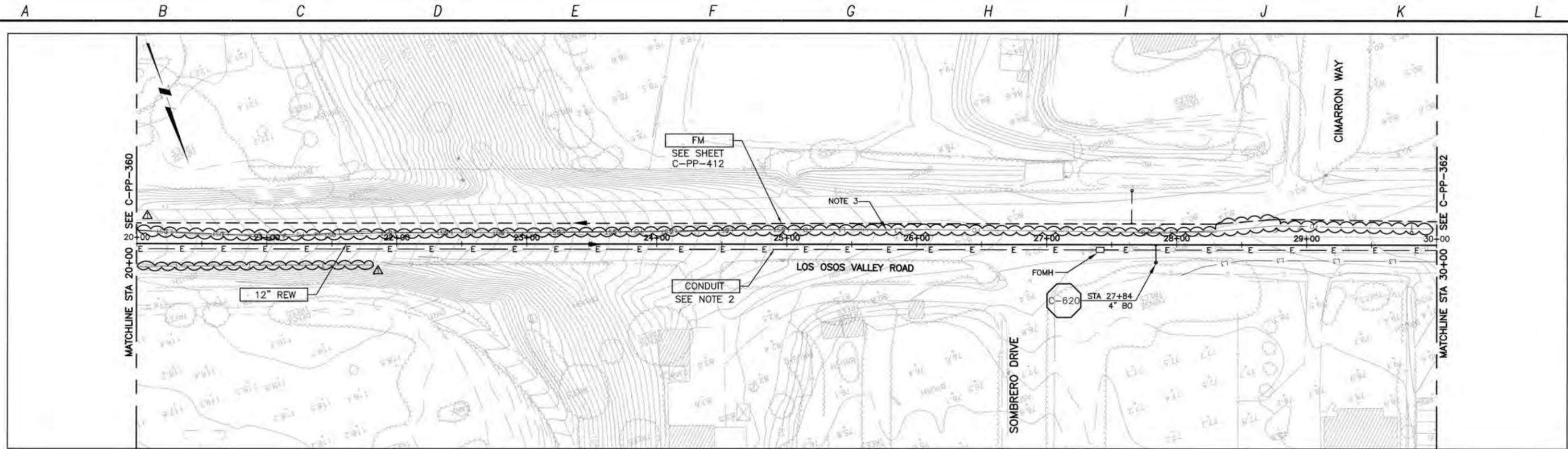
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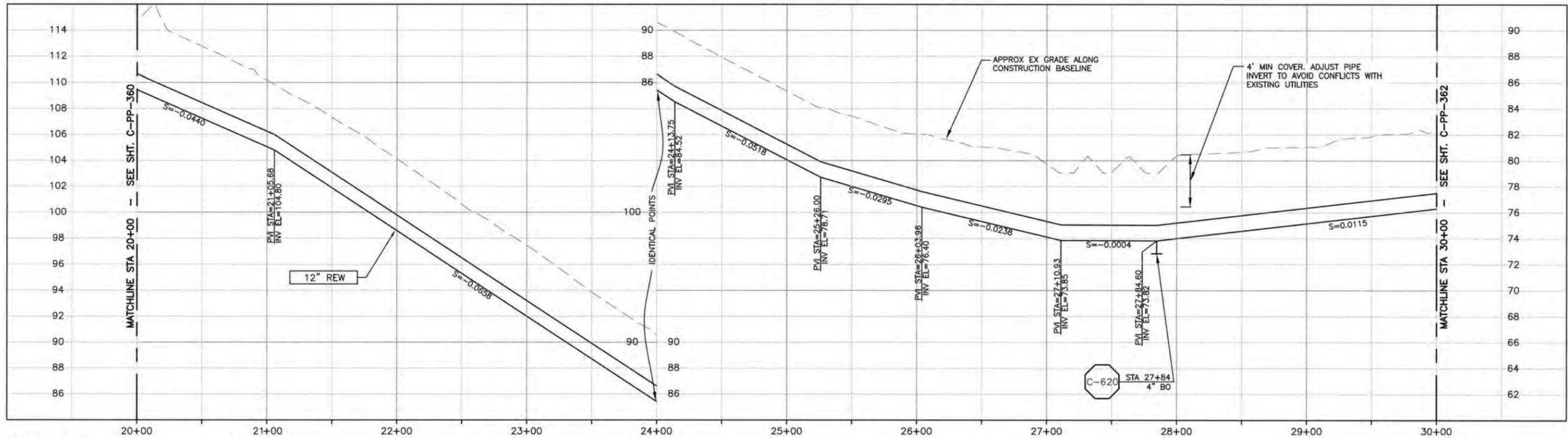
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - REW
 LOS OSOS VALLEY ROAD
 STA 9+63.10 TO STA 20+00

PROJECT NO. 42502-83120
 FILE NAME: C-PP-360
 SHEET NO.
C-PP-360

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

CONSTRUCTION BASELINE STATION

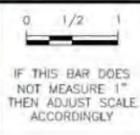
NOTES

1. NOMINAL REW FORCE MAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 14".
2. REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
3. MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
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 CHECKED BY: BJC
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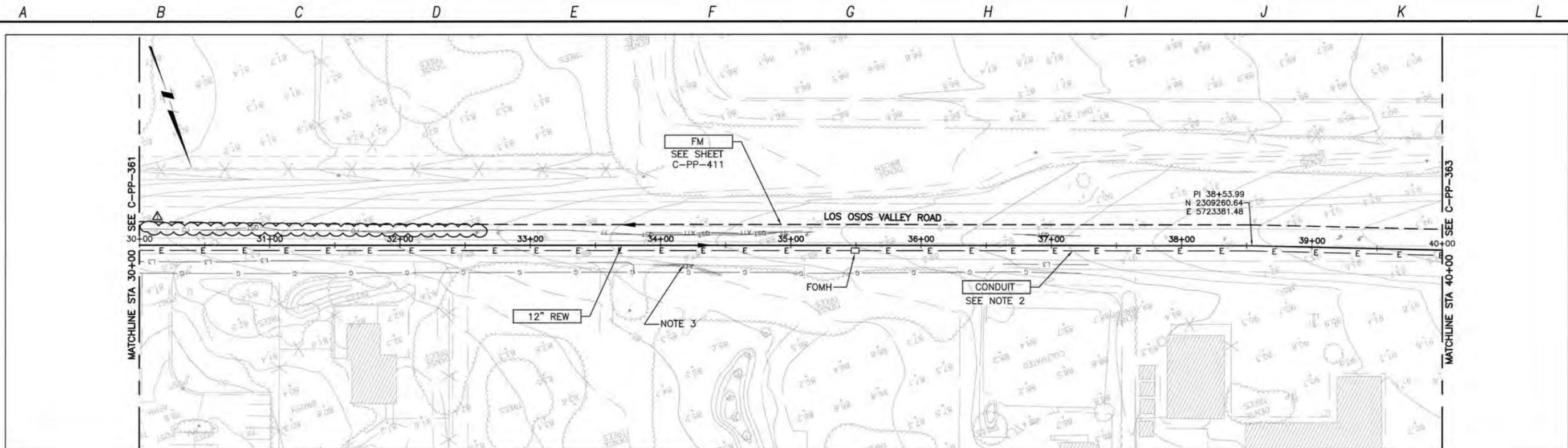
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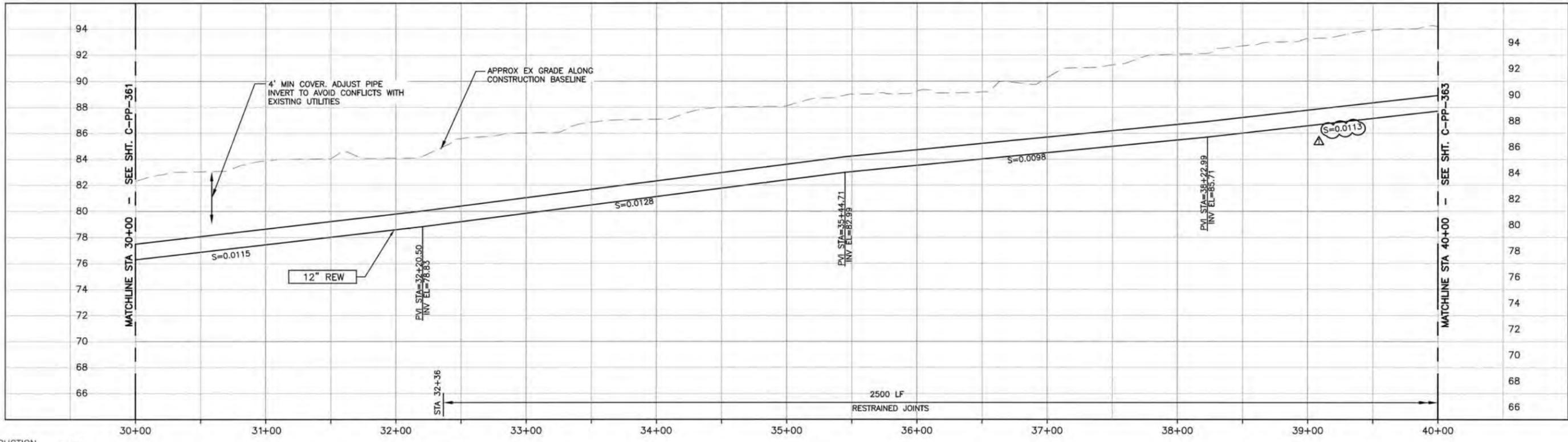
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - REW
 LOS OSOS VALLEY ROAD
 STA 20+00 TO STA 30+00

SCALE:
 HORZ: 1"=40'
 VERT: 1"=4'
 PROJECT NO. 42502-83120
 FILE NAME: C-PP-361
 SHEET NO.
C-PP-361

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

- CONSTRUCTION BASELINE STATION
- NOTES
1. NOMINAL REW FORCE MAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 14".
 2. REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 3. MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLE.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
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 DATE: APRIL 2012



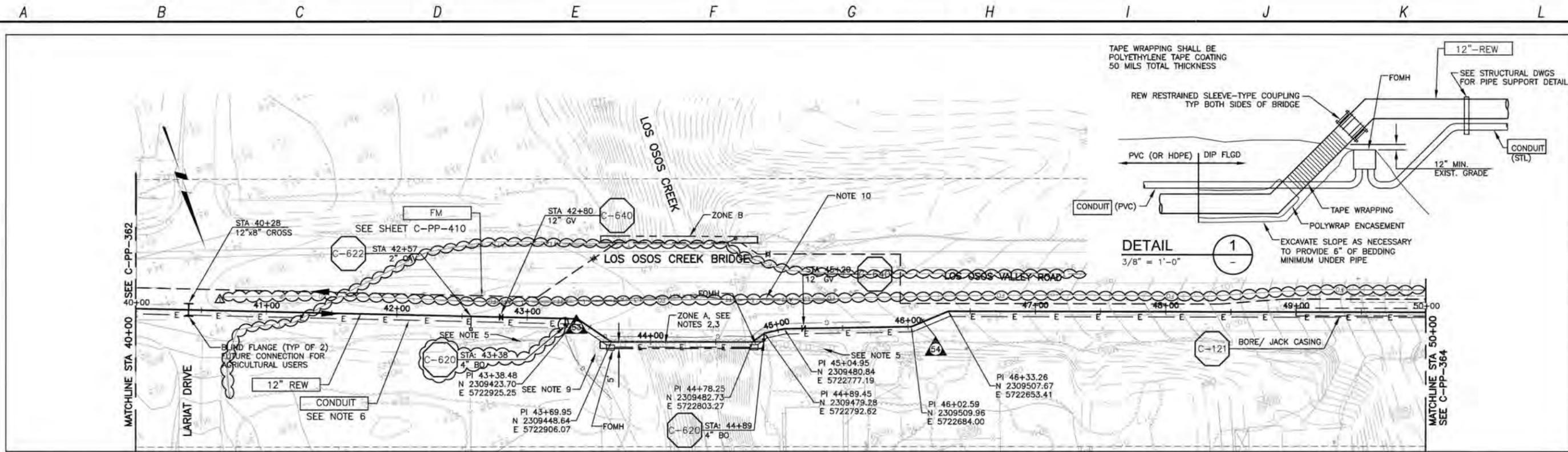
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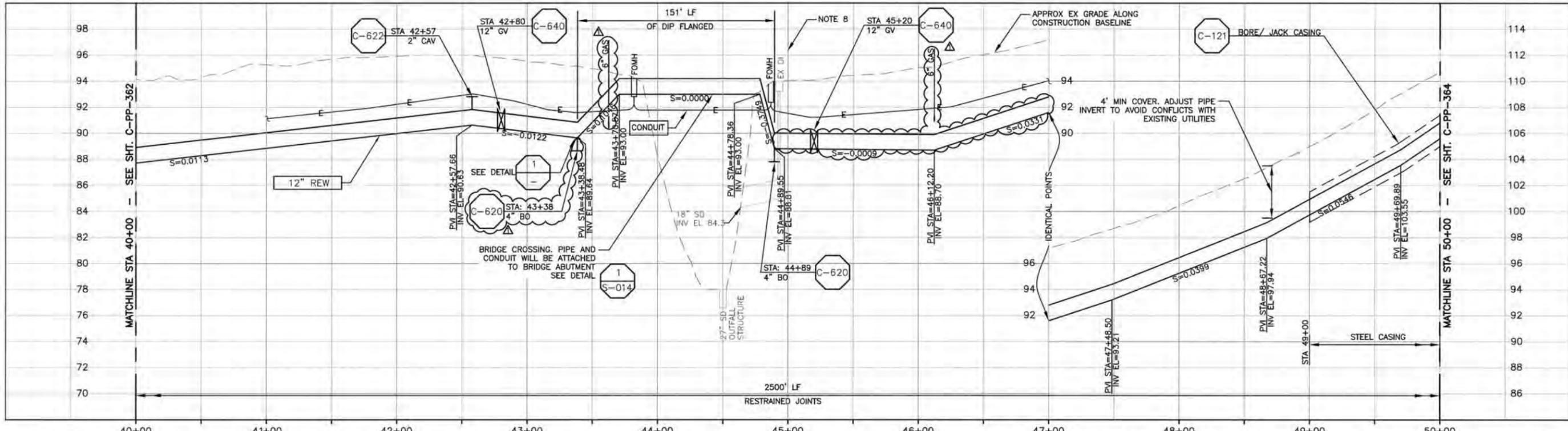
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - REW
 LOS OSOS VALLEY ROAD
 STA 30+00 TO STA 40+00

PROJECT NO. 42502-83120
 FILE NAME: C-PP-362
 SHEET NO. C-PP-362

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

- CONSTRUCTION BASELINE STATION**
- NOTES**
- NOMINAL REW FORCE MAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 14".
 - TRIM TREE BRANCHES TO PROVIDE 5-FOOT CLEARANCE FROM EDGE OF BRIDGE DECK.
 - DISTURBANCE ZONE A IS 140-FOOT LONG BY 5-FOOT WIDE.
 - DISTURBANCE ZONE B IS 120-FOOT LONG BY 5-FOOT WIDE.
 - PROTECT GUARD RAIL AND POSTS.
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 - NOT USED.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND REPLACEMENT AS NEEDED TO ACCOMMODATE CONSTRUCTION OF REW.
 - REPLACE EXISTING METAL GUARD RAILING, POSTS, AND CABLE ANCHOR ASSEMBLIES IN TYPE AND KIND AS NEEDED TO ACCOMMODATE CONSTRUCTION OF REW.
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT AND MANHOLES.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
 DRAWN BY: RKU
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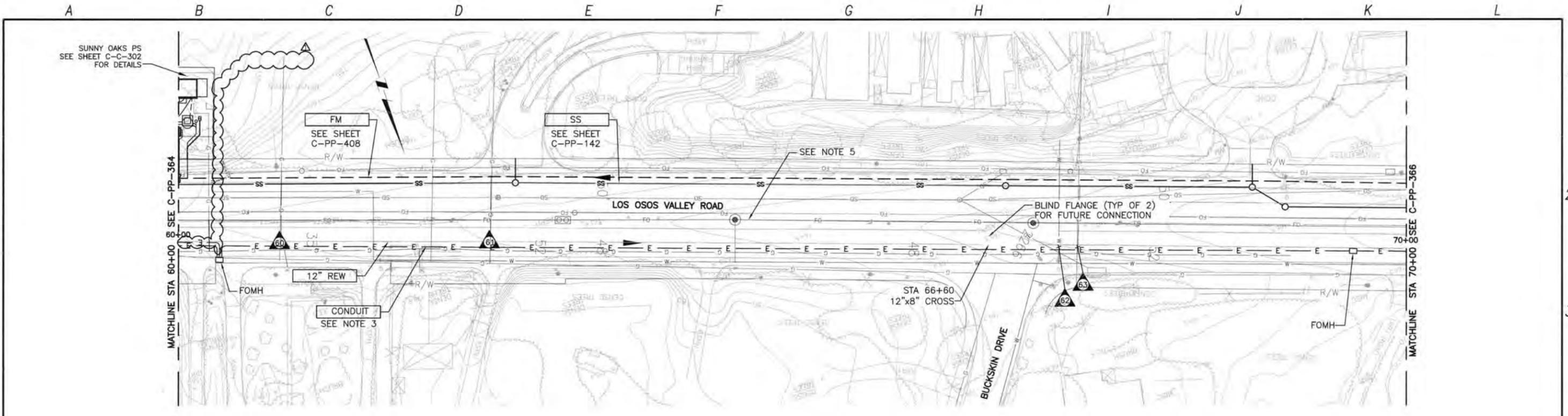


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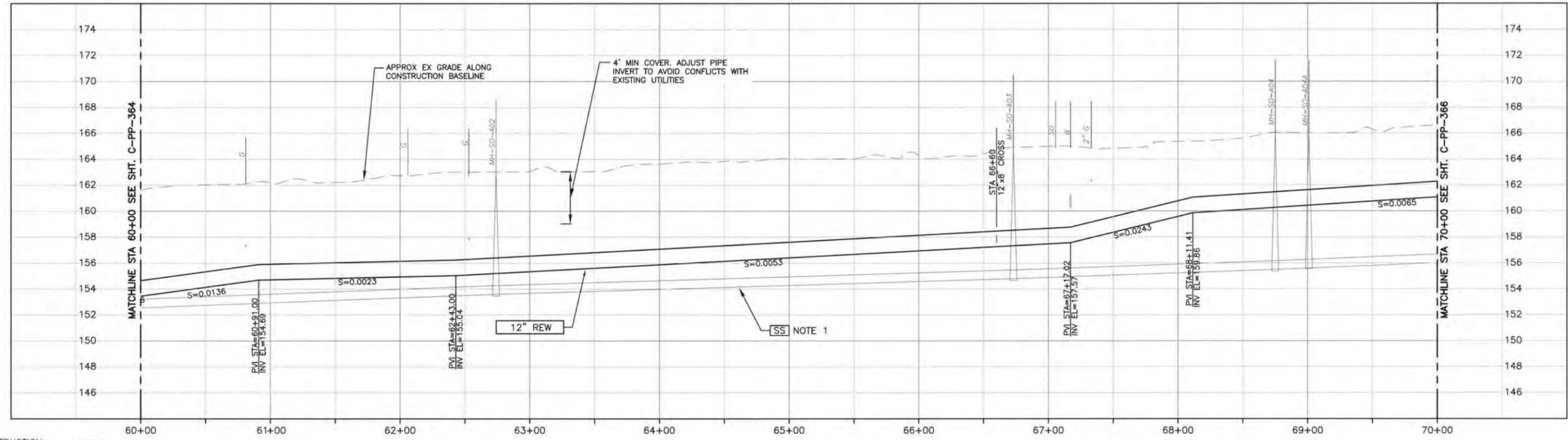
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - REW
 LOS OSOS VALLEY ROAD
 STA 40+00 TO STA 50+00

PROJECT NO. 42502-83120
 FILE NAME: C-PP-363
 SHEET NO. C-PP-363

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

- CONSTRUCTION BASELINE STATION
- NOTES:
- GRAVITY SEWER (SS) PIPE OUT OF SECTION. SS SHOWN FOR REFERENCE ONLY.
 - NOMINAL R/W FORCE MAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 14".
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 - NOT USED.
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/24/12	LLB	RLA		ADDENDUM #2

DESIGNED BY: KS, RLA
 DRAWN BY: RKU
 CHECKED BY: BJC
 DATE: APRIL 2012

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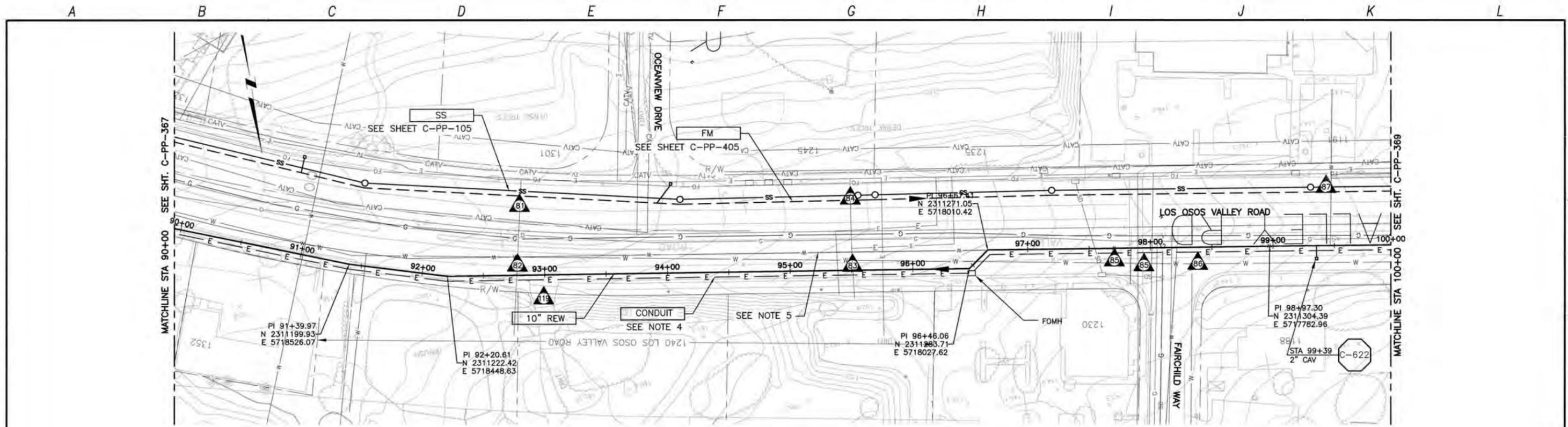


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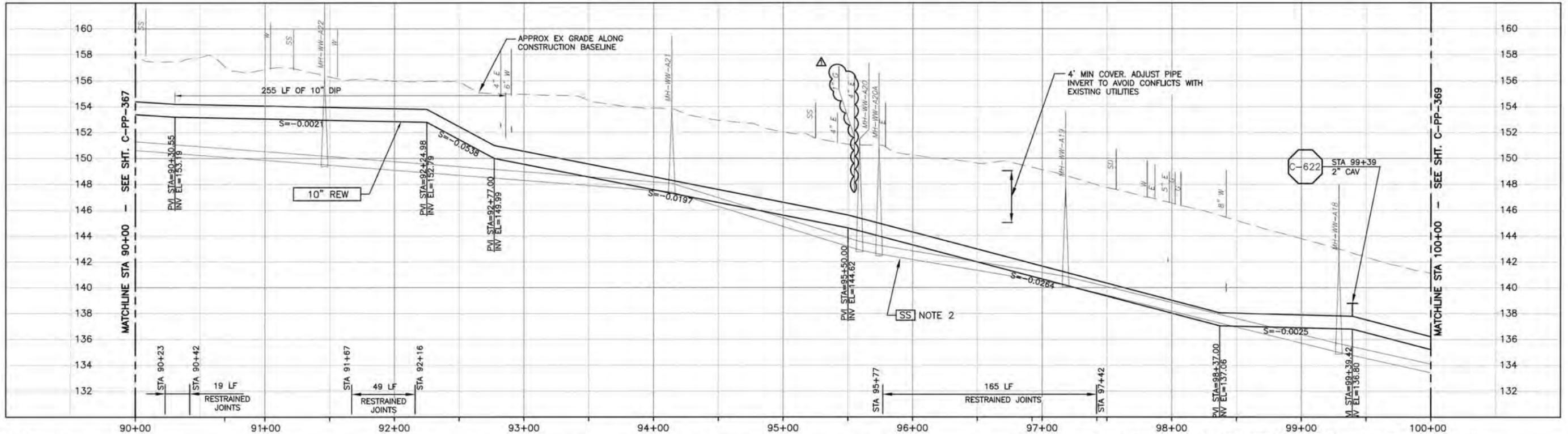
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - R/W
 LOS OSOS VALLEY ROAD
 STA 60+00 TO STA 70+00

PROJECT NO. 42502-83120
 FILE NAME: C-PP-365
 SHEET NO. C-PP-365

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PLAN ON LOS OSOS VALLEY ROAD

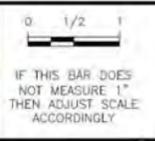


PROFILE ON LOS OSOS VALLEY ROAD

- CONSTRUCTION BASELINE STATION
- NOTES:
- CONTRACTOR SHALL NOTE THAT MAPPING PREDATES DEVELOPMENT AT 1240 LOS OSOS VALLEY ROAD. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
 - GRAVITY SEWER (SS) PIPE OUT OF SECTION. SS SHOWN FOR REFERENCE ONLY.
 - NOMINAL R/W FORCE MAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 12".
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 - CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF WATER LINE BEFORE INSTALLING R/W PIPE. PROVIDE MIN. HORIZONTAL AND VERTICAL CLEARANCE.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
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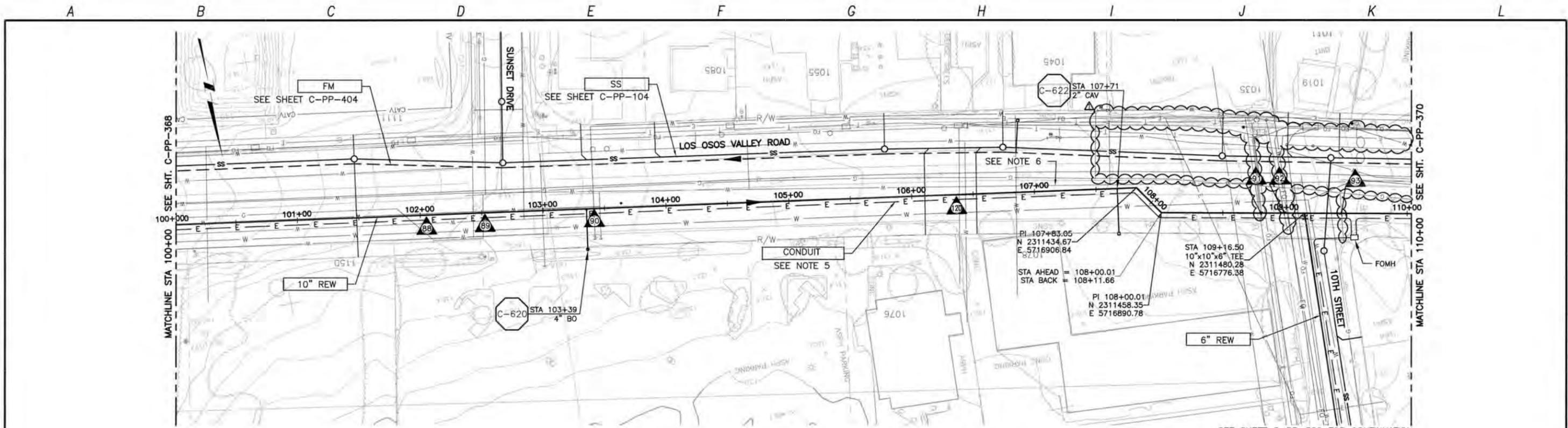


LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - R/W
 LOS OSOS VALLEY ROAD
 STA 90+00 TO STA 100+00

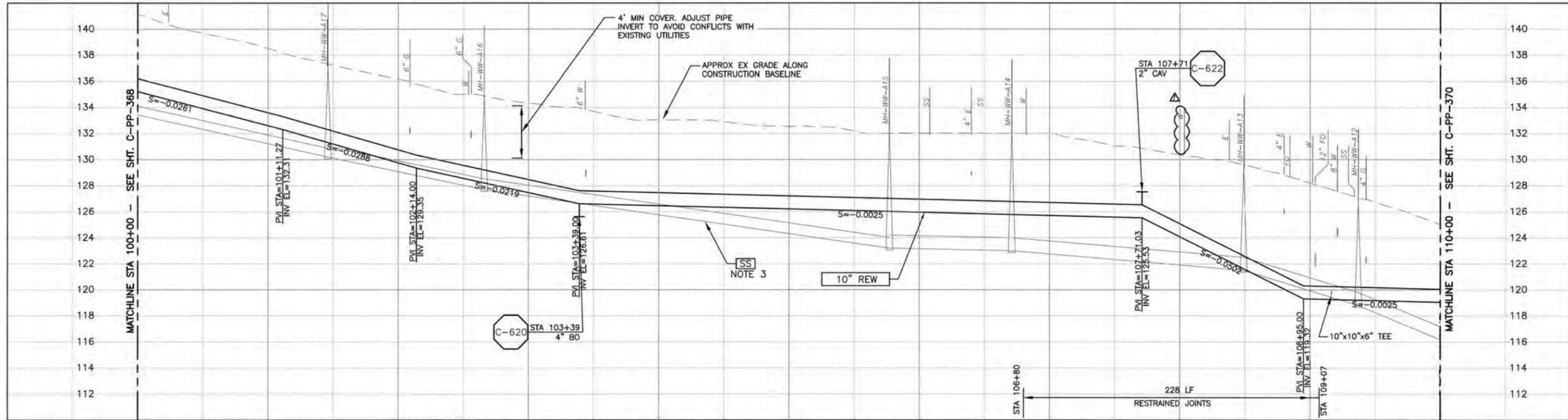
SCALE:
 HORIZ: 1"=40'
 VERT: 1"=4'

PROJECT NO. 42502-B3120
 FILE NAME: C-PP-368
 SHEET NO.
C-PP-368

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

MATCHLINE STA 100+00 - SEE SHT. C-PP-368
 MATCHLINE STA 110+00 - SEE SHT. C-PP-370

- NOTES:**
- CONTRACTOR SHALL REPAIR EXISTING TRAFFIC CONTROL SYSTEM, INCLUDING INSTALLING NEW DETECTOR LOOPS, WHERE CONSTRUCTION RESULTS IN DAMAGE TO EXISTING SYSTEM. CONTRACTOR SHALL COORDINATE REPAIRS WITH COUNTY OF SAN LUIS OBISPO.
 - NOT ALL MONITORING WELLS ARE SHOWN.
 - GRAVITY SEWER (SS) PIPE OUT OF SECTION. SS SHOWN FOR REFERENCE ONLY.
 - NOMINAL REW FORCE MAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 12".
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 - CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF WATER LINE BEFORE INSTALLING REW PIPE. PROVIDE MIN. HORIZONTAL AND VERTICAL CLEARANCE.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
 DRAWN BY: RKU
 CHECKED BY: BJC
 DATE: APRIL 2012

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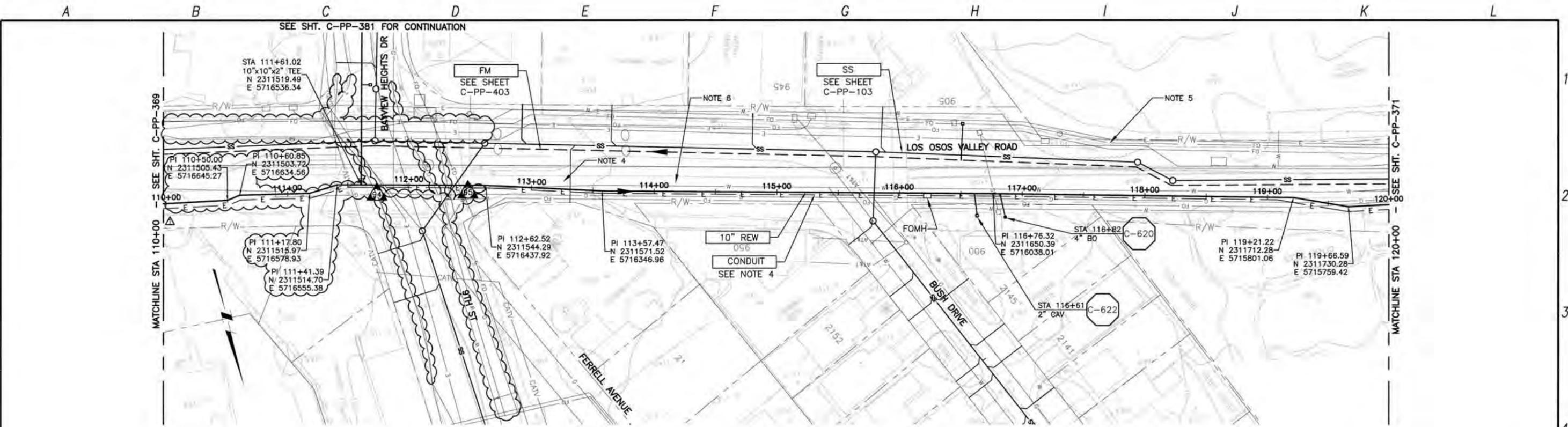


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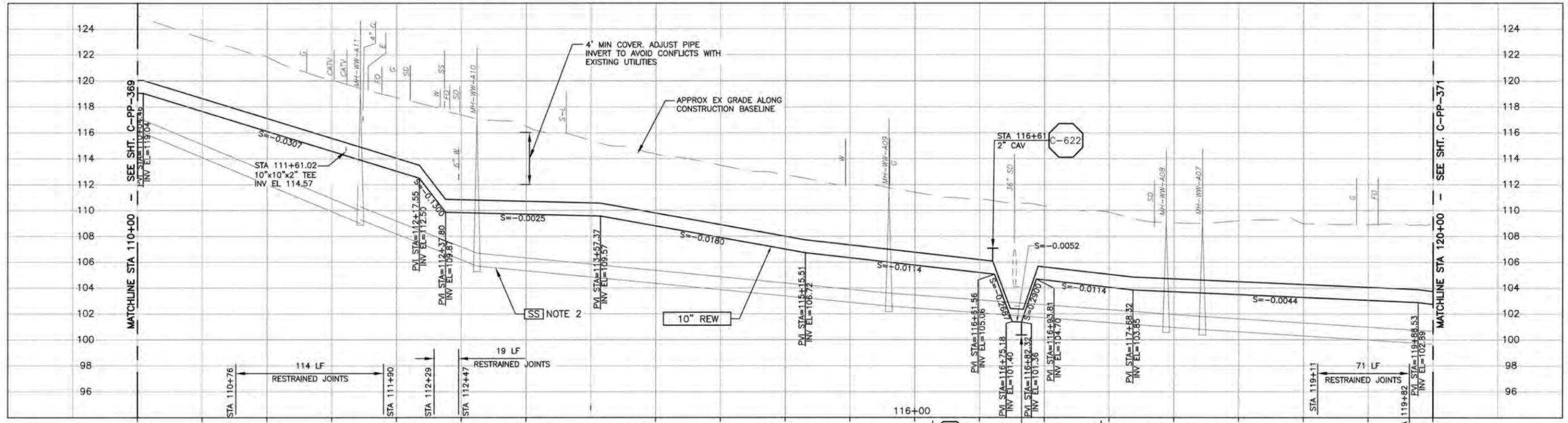
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - REW
 LOS OSOS VALLEY ROAD
 STA 100+00 TO STA 110+00

PROJECT NO. 42502-83120
 FILE NAME: C-PP-369
 SHEET NO. C-PP-369

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

- CONSTRUCTION BASELINE STATION**
- NOTES:**
- CONTRACTOR SHALL REPAIR EXISTING TRAFFIC CONTROL SYSTEM, INCLUDING INSTALLING NEW DETECTOR LOOPS, WHERE CONSTRUCTION RESULTS IN DAMAGE TO EXISTING SYSTEM. CONTRACTOR SHALL COORDINATE REPAIRS WITH COUNTY OF SAN LUIS OBISPO.
 - GRAVITY SEWER (SS) PIPE OUT OF SECTION. SS SHOWN FOR REFERENCE ONLY.
 - NOMINAL R/W FORCE MAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 12".
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT AND MANHOLES.
 - CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF WATER LINE BEFORE INSTALLING R/W PIPE. PROVIDE MIN. HORIZONTAL AND VERTICAL CLEARANCE.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
 DRAWN BY: RJK
 CHECKED BY: BJC
 DATE: APRIL 2012

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 Sacramento, CA 95833
 Tel: (916) 567-9900



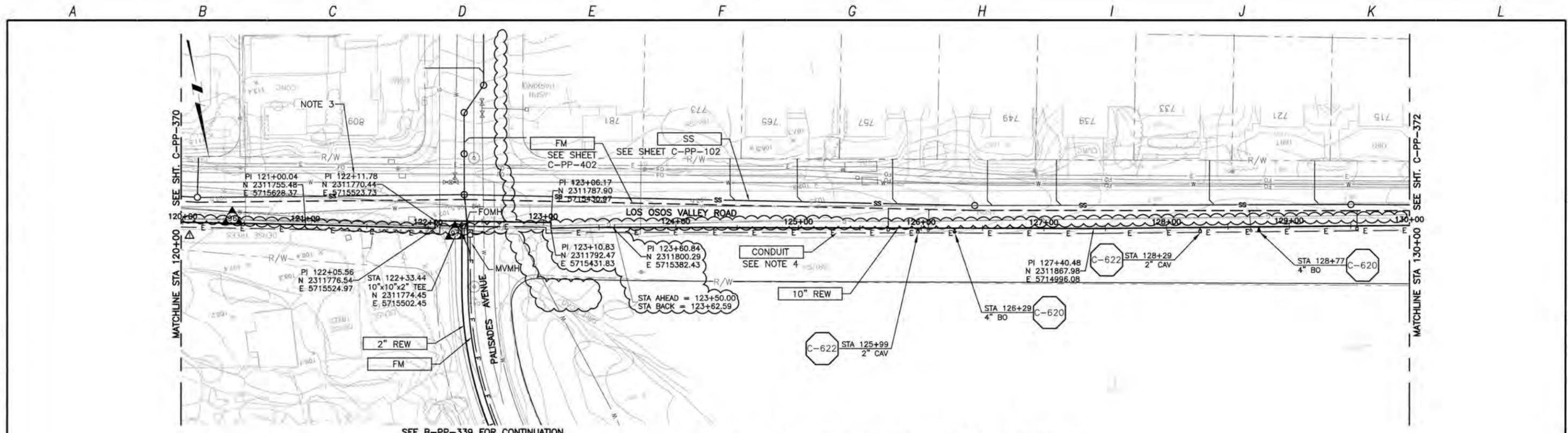
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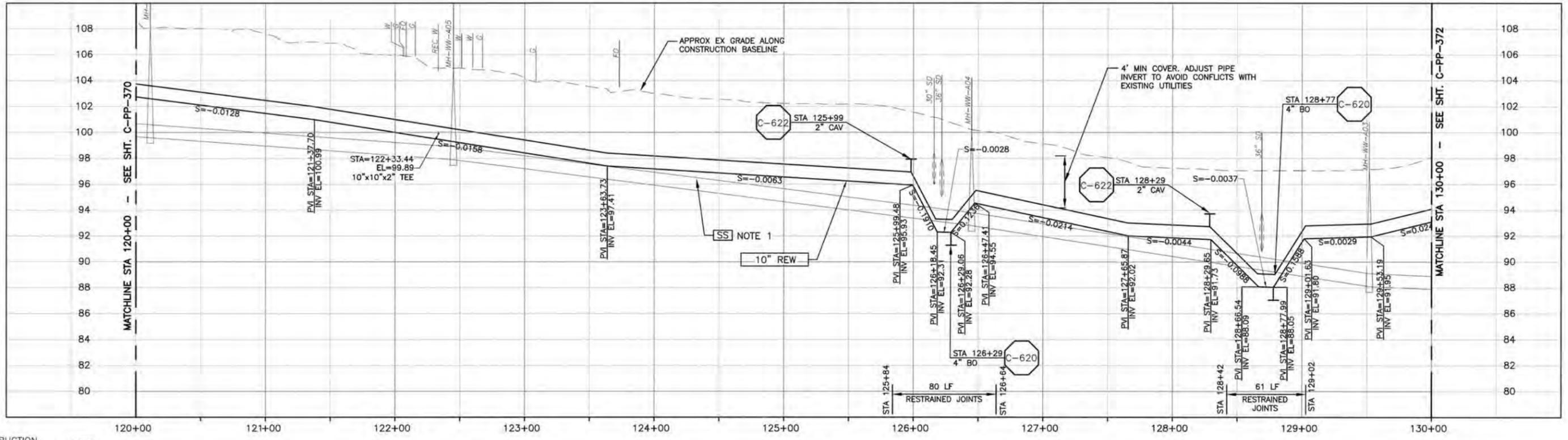
LOS OSOS WASTEWATER COLLECTION SYSTEM
PLAN AND PROFILE - R/W
LOS OSOS VALLEY ROAD
STA 110+00 TO STA 120+00

PROJECT NO. 42502-83120
 FILE NAME: C-PP-370
 SHEET NO. **C-PP-370**

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PLAN ON LOS OSOS VALLEY ROAD

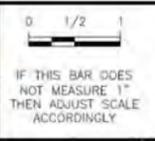


PROFILE ON LOS OSOS VALLEY ROAD

- CONSTRUCTION BASELINE STATION**
- NOTES:**
- GRAVITY SEWER (SS) PIPE OUT OF SECTION. SS SHOWN FOR REFERENCE ONLY.
 - NOMINAL REW FORCE MAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 12".
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT AND MANHOLES.
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
 DRAWN BY: RKU
 CHECKED BY: BJC
 DATE: APRIL 2012

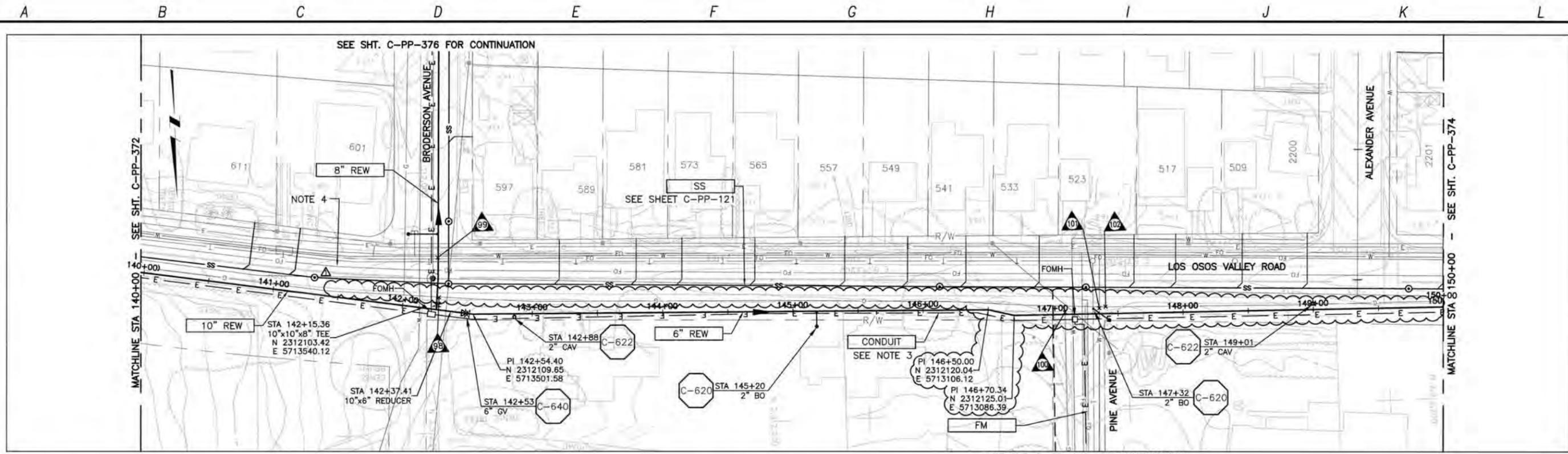


LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - REW
 LOS OSOS VALLEY ROAD
 STA 120+00 TO STA 130+00

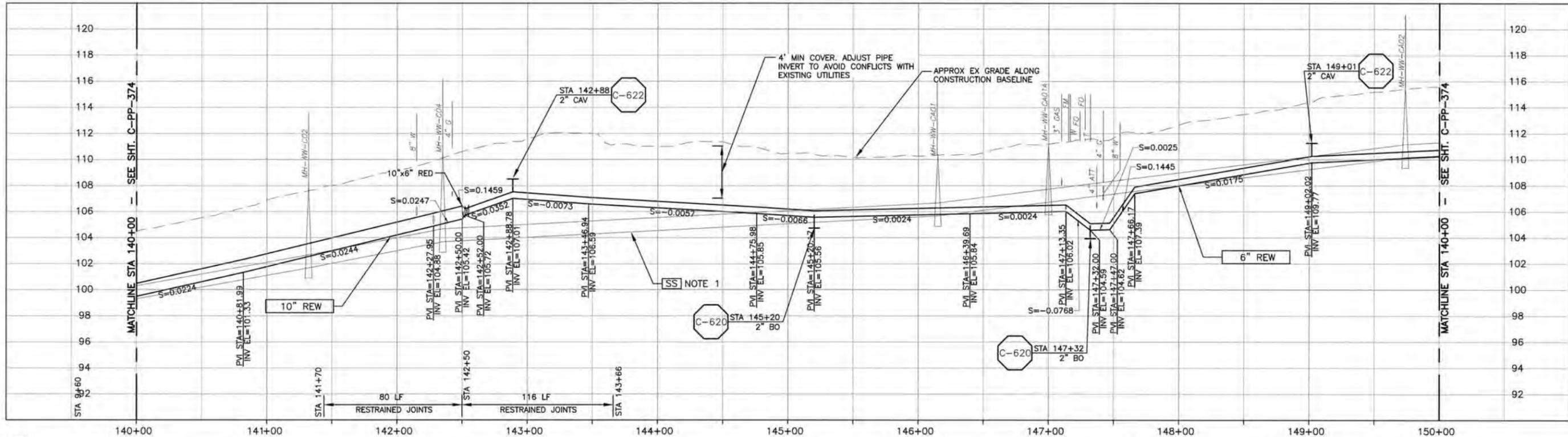
PROJECT NO. 42502-83120
 FILE NAME: C-PP-371
 SHEET NO. C-PP-371

SCALE:
 HORIZ: 1"=40'
 VERT: 1"=4'

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

- CONSTRUCTION BASELINE STATION**
- NOTES:**
- GRAVITY SEWER (SS) PIPE OUT OF SECTION. SS SHOWN FOR REFERENCE ONLY.
 - NOMINAL REW FORCE MAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED FOR 10" PVC, NOMINAL PIPE SIZE SHALL BE 12".
 - REFER TO SHEET C-C-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT AND MANHOLES.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
 DRAWN BY: RLU
 CHECKED BY: BUC
 DATE: APRIL 2012



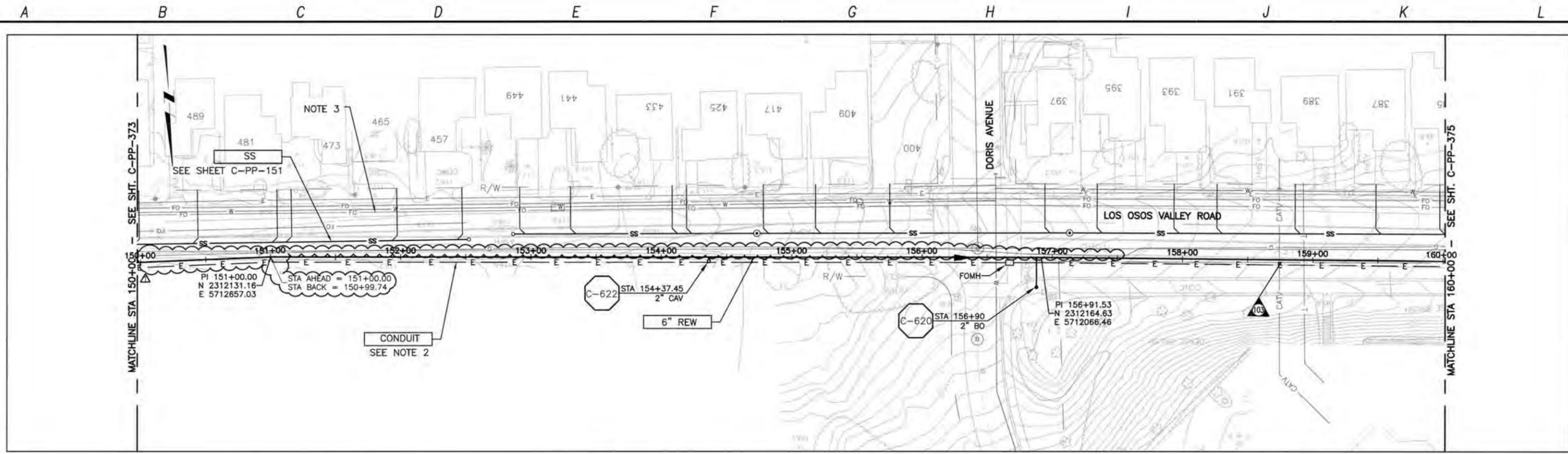
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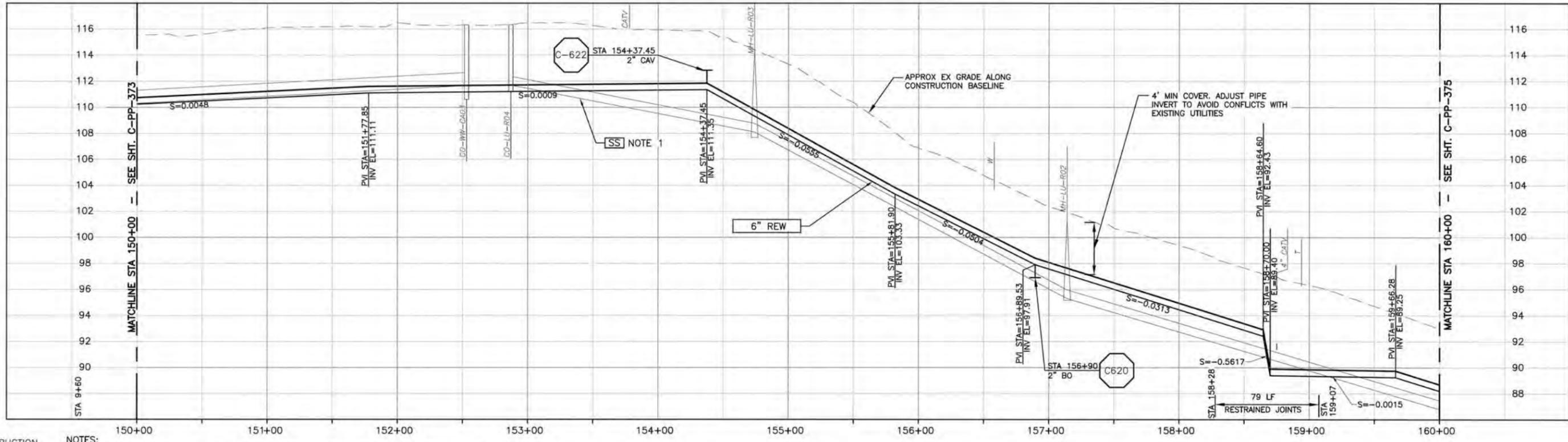
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - REW
 LOS OSOS VALLEY ROAD
 STA 140+00 TO STA 150+00

PROJECT NO. 42502-83120
 FILE NAME: C-PP-373
 SHEET NO. C-PP-373

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

- CONSTRUCTION BASELINE STATION
- NOTES:
- GRAVITY SEWER (SS) PIPE OUT OF SECTION. SS SHOWN FOR REFERENCE ONLY.
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPELINE.
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT AND MANHOLES.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
 DRAWN BY: RKU
 CHECKED BY: BJC
 DATE: APRIL 2012

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0 1/2 1
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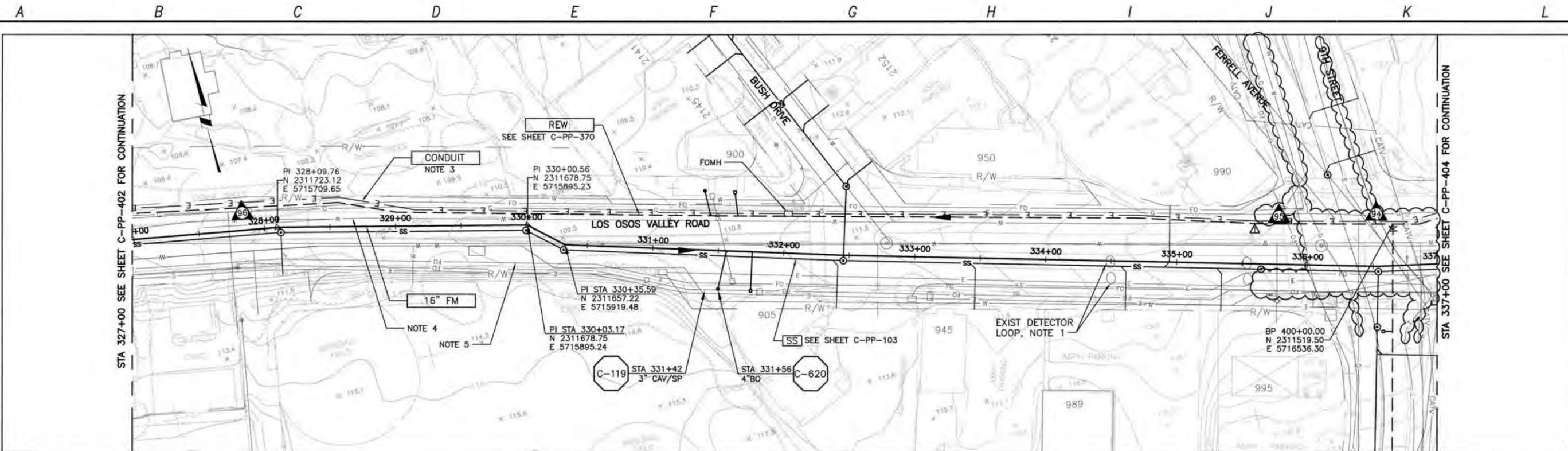


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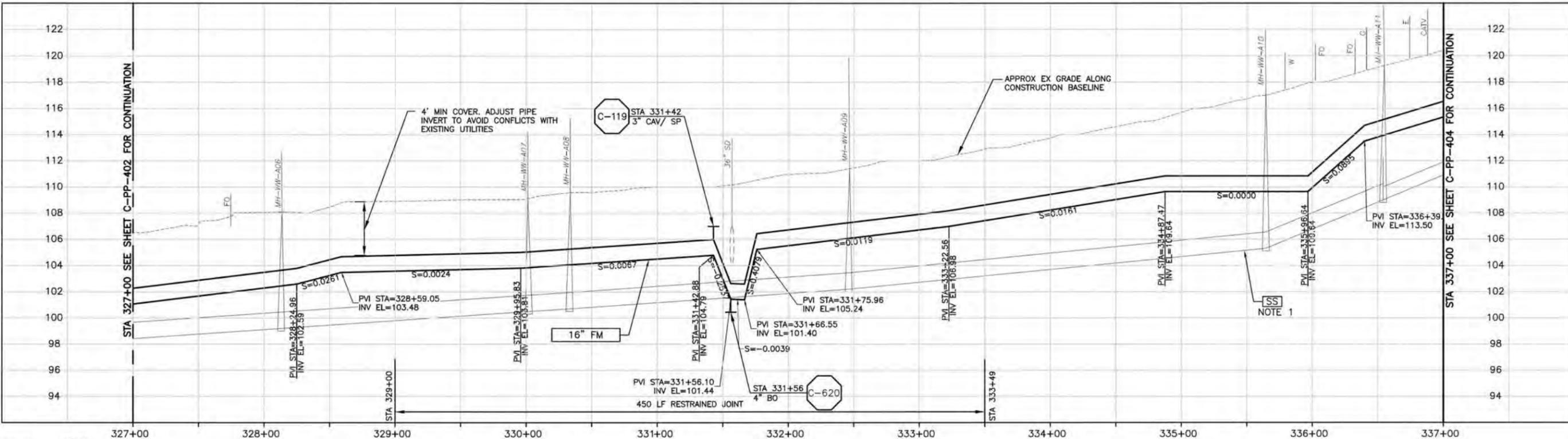
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - REW
 LOS OSOS VALLEY ROAD
 STA 150+00 TO STA 160+00

PROJECT NO. 42502-83120
 FILE NAME: C-PP-374
 SHEET NO. C-PP-374

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PLAN ON LOS OSOS VALLEY ROAD



- CONSTRUCTION BASELINE STATION
- NOTES:**
- GRAVITY SEWER (SS) PIPE OUT OF SECTION. SS SHOWN FOR REFERENCE ONLY.
 - NOMINAL FORCEMAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 18".
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPE LINE.
 - CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF WATER LINE BEFORE INSTALLING FM PIPE. PROVIDE MIN. HORIZONTAL AND VERTICAL CLEARANCE.
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

PROFILE ON LOS OSOS VALLEY ROAD

DESIGNED BY:	KS, RLA
DRAWN BY:	RU
CHECKED BY:	BJC
DATE:	APRIL 2012

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

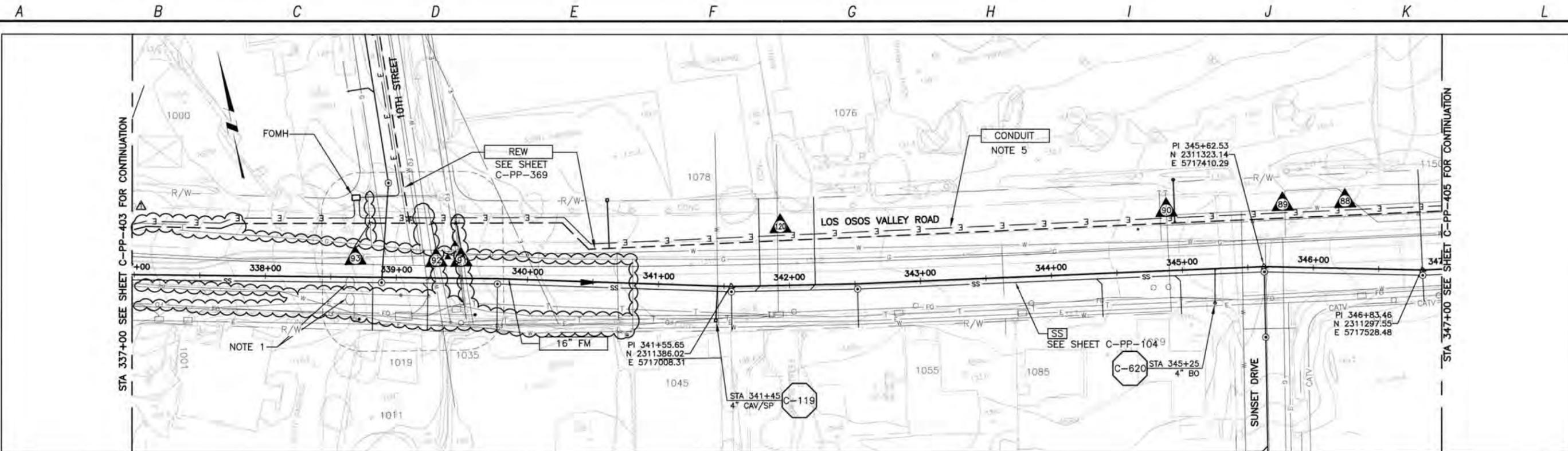
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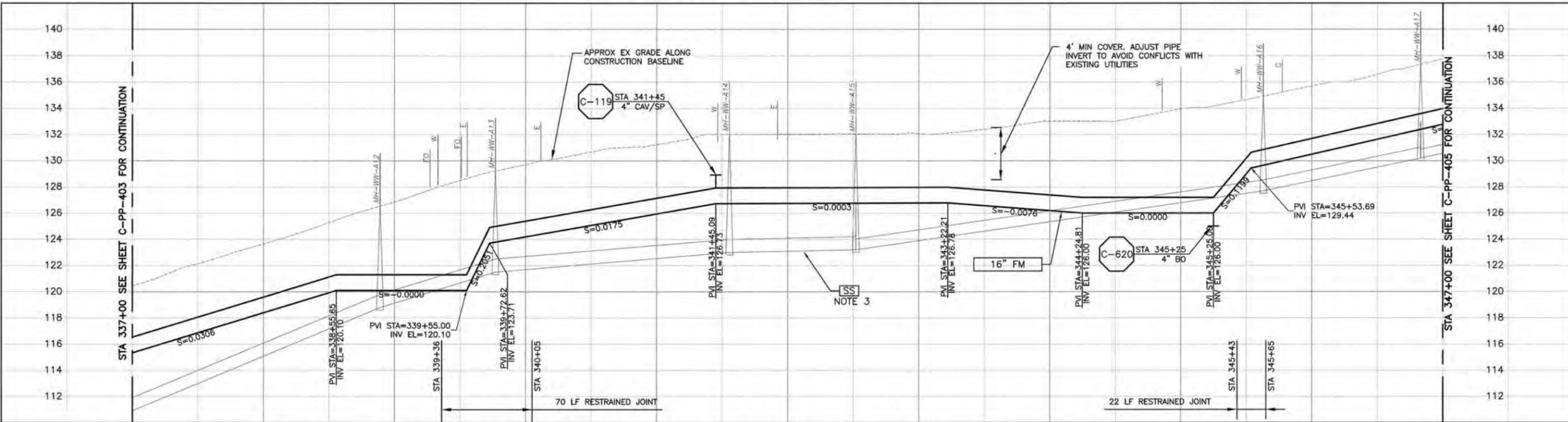
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - FM
 LOS OSOS VALLEY ROAD
 STA 327+00 TO STA 337+00

PROJECT NO. 42502-B3120
 FILE NAME: C-PP-403
 SHEET NO.
C-PP-403

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PLAN ON LOS OSOS VALLEY ROAD

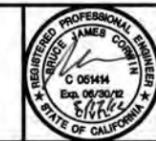
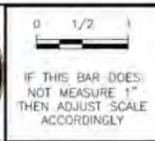


PROFILE ON LOS OSOS VALLEY ROAD

- NOTES:**
- CONTRACTOR SHALL REPAIR EXISTING TRAFFIC CONTROL SYSTEM, INCLUDING INSTALLING NEW DETECTOR LOOPS, WHERE CONSTRUCTION RESULTS IN DAMAGE TO EXISTING SYSTEM. CONTRACTOR SHALL COORDINATE REPAIRS WITH COUNTY OF SAN LUIS OBISPO.
 - NOT ALL MONITORING WELLS ARE SHOWN.
 - GRAVITY SEWER (SS) PIPE OUT OF SECTION. SS SHOWN FOR REFERENCE ONLY.
 - NOMINAL FORCEMAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 18".
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPE LINE.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

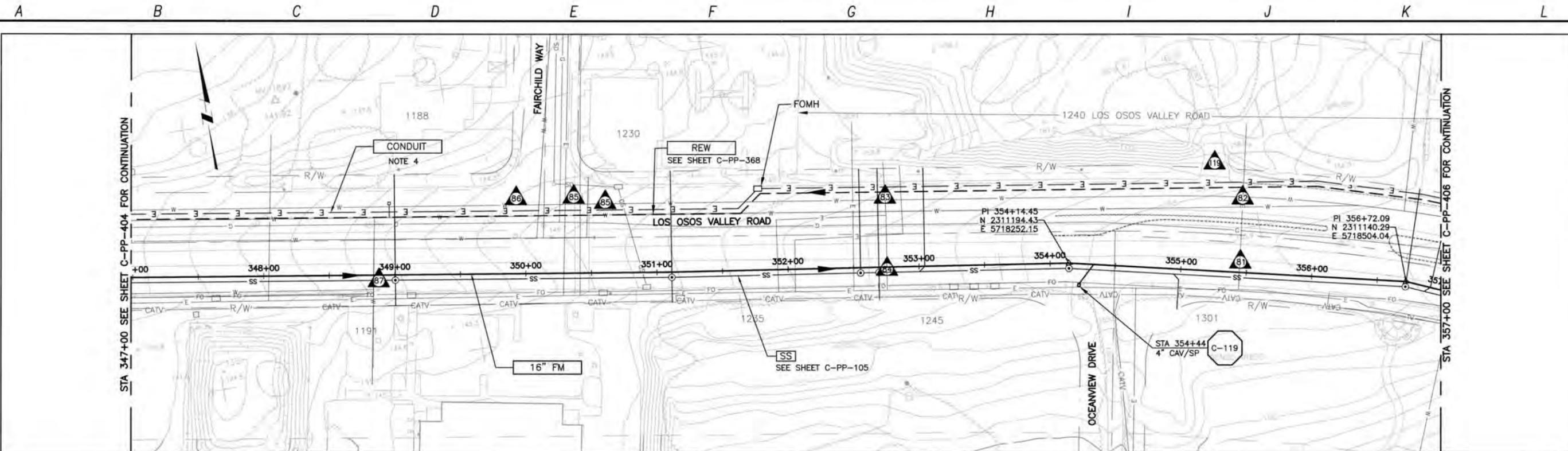
DESIGNED BY: KS, RLA
 DRAWN BY: RKU
 CHECKED BY: BJC
 DATE: APRIL 2012



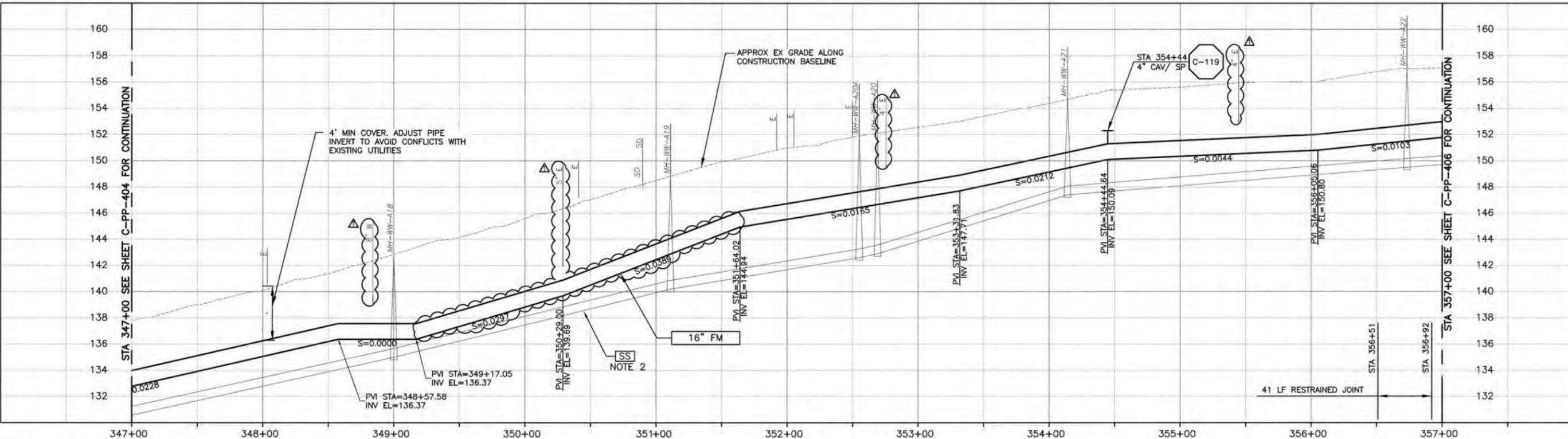
LOS OSOS WASTEWATER COLLECTION SYSTEM
PLAN AND PROFILE - FM
 LOS OSOS VALLEY ROAD
 STA 337+00 TO STA 347+00

PROJECT NO. 42502-83120
 FILE NAME: C-PP-404
 SHEET NO.
C-PP-404

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PLAN ON LOS OSOS VALLEY ROAD



- NOTES:**
- CONTRACTOR SHALL NOTE THAT MAPPING PREDATES DEVELOPMENT AT 1240 LOS OSOS VALLEY ROAD. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
 - GRAVITY SEWER (SS) PIPE OUT OF SECTION. SS SHOWN FOR REFERENCE ONLY.

- NOMINAL FORCEMAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 18".
- REFER TO SHEET C-G-010 FOR REQUIREMENT OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPE LINE.

PROFILE ON LOS OSOS VALLEY ROAD

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
 DRAWN BY: RU
 CHECKED BY: BJC
 DATE: APRIL 2012

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 Tel: (916) 567-9900



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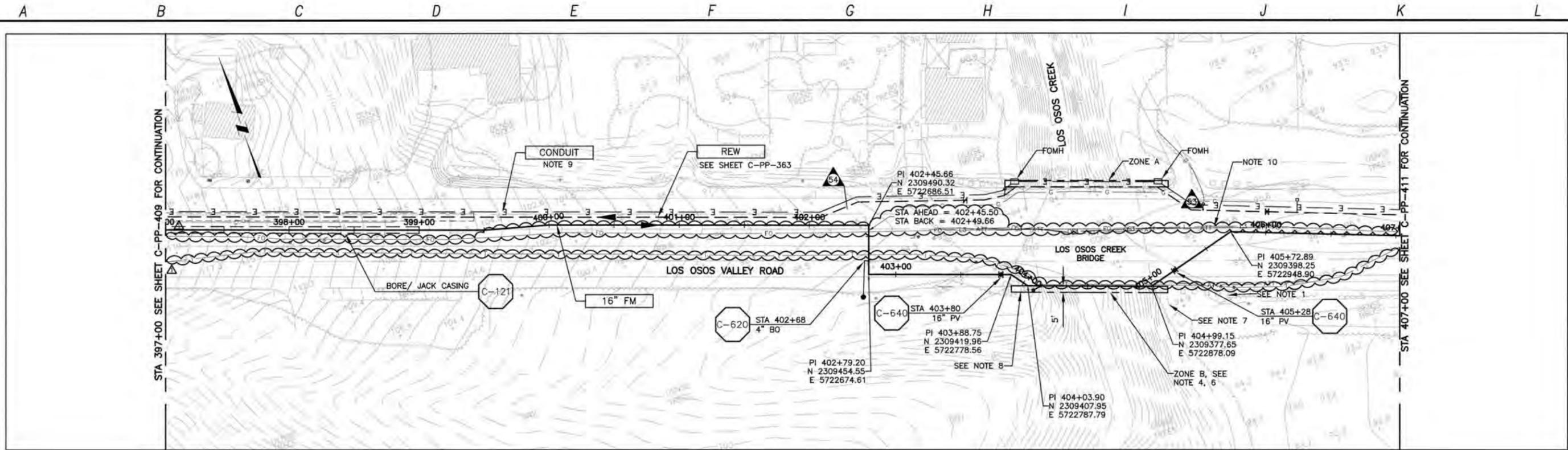


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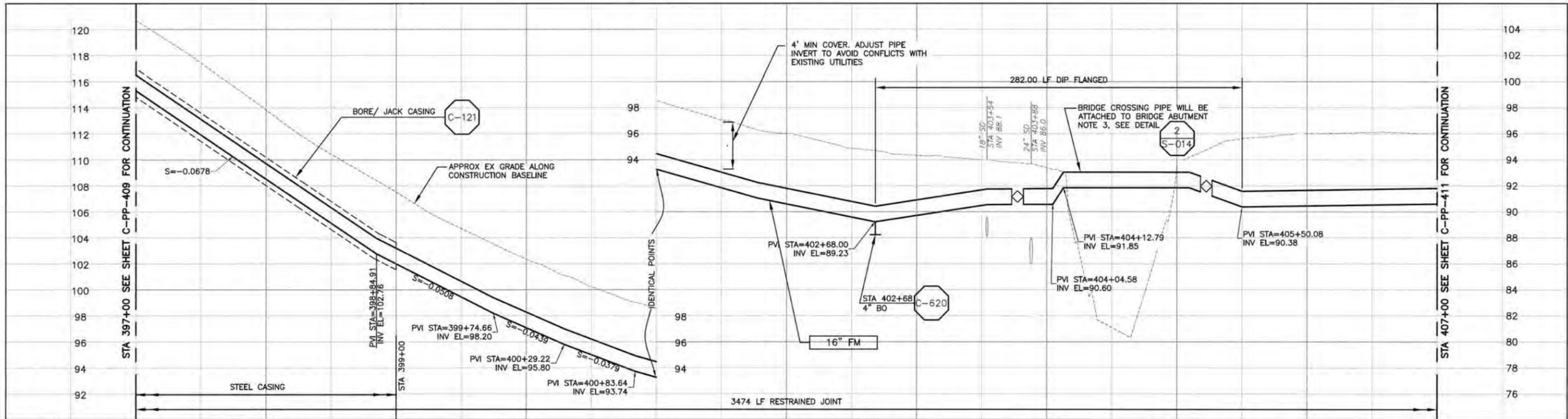
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - FM
 LOS OSOS VALLEY ROAD
 STA 347+00 TO STA 357+00

PROJECT NO. 42502-83120
 FILE NAME: C-PP-405
 SHEET NO. C-PP-405

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

- NOTES:**
- REPLACE EXISTING METAL GUARD RAILING, POSTS, AND CABLE ANCHOR ASSEMBLIES IN TYPE AND KIND. REPLACE DRAIN INLET IN TYPE AND KIND.
 - NOMINAL FORCEMAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 18".
 - CONTRACTOR TO VERIFY DEPTH AND DIAMETER OF EXISTING 24" UTILITY VOIDS AND ADJUST PIPE DEPTH ACCORDINGLY. SEAL OPENING WITH LINK SEAL AFTER PIPE PENETRATION. PROVIDE INTERMEDIATE SUPPORT PER SPEC.
 - TRIM TREE BRANCHES TO PROVIDE 5-FOOT CLEARANCE FROM EDGE OF BRIDGE DECK.
 - DISTURBANCE ZONE A IS 140-FOOT LONG BY 5-FOOT WIDE.
 - DISTURBANCE ZONE B IS 120-FOOT LONG BY 5-FOOT WIDE.
 - PROTECT SIGN, LIGHTING, AND STATUE.
 - PROTECT GUARD RAIL AND POSTS.
 - REFER TO SHEET C-C-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPE LINE.
 - MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

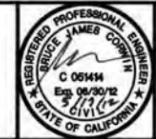
REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
 DRAWN BY: RU
 CHECKED BY: BJC
 DATE: APRIL 2012

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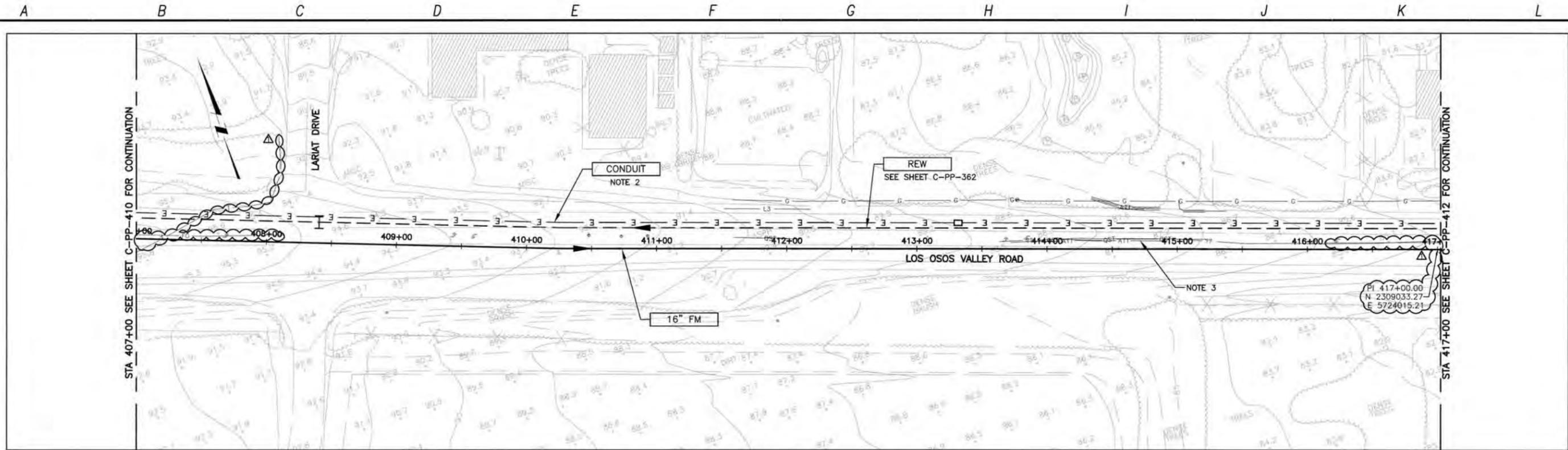
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LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - FM
 LOS OSOS VALLEY ROAD
 STA 397+00 TO STA 407+00

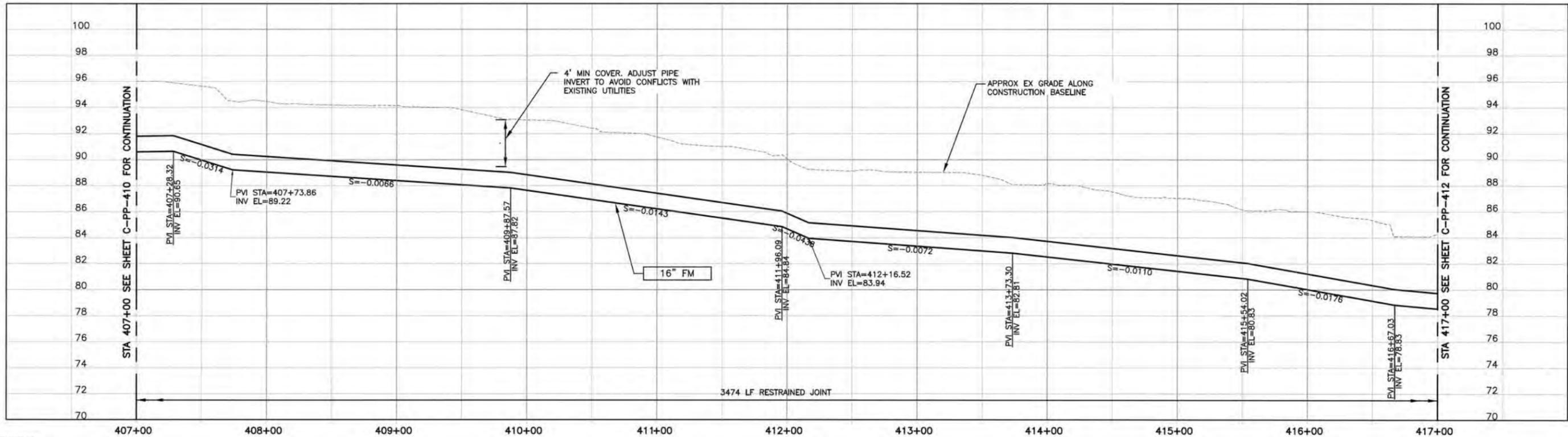
PROJECT NO. 42502-83120
 FILE NAME: C-PP-410
 SHEET NO. C-PP-410

SCALE:
 HORIZ: 1"=40'
 VERT: 1"=4'

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

CONSTRUCTION
BASELINE
STATION

NOTES:

- NOMINAL FORCEMAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 18".

- REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPE LINE.

- MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

SCALE:
HORZ: 1"=40'
VERT: 1"=4'

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	5/18/12	LLB	RLA	ADDENDUM #1

DESIGNED BY: KS, RLA
DRAWN BY: RU
CHECKED BY: BJC
DATE: APRIL 2012

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Sacramento, CA 95833
Tel: (916) 567-9900



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IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY

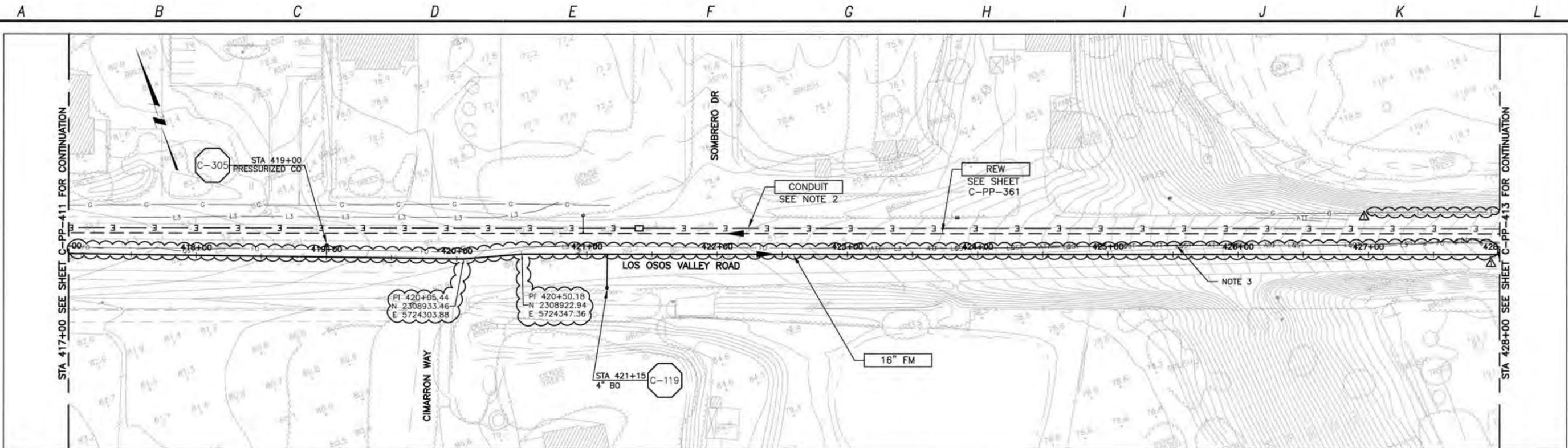


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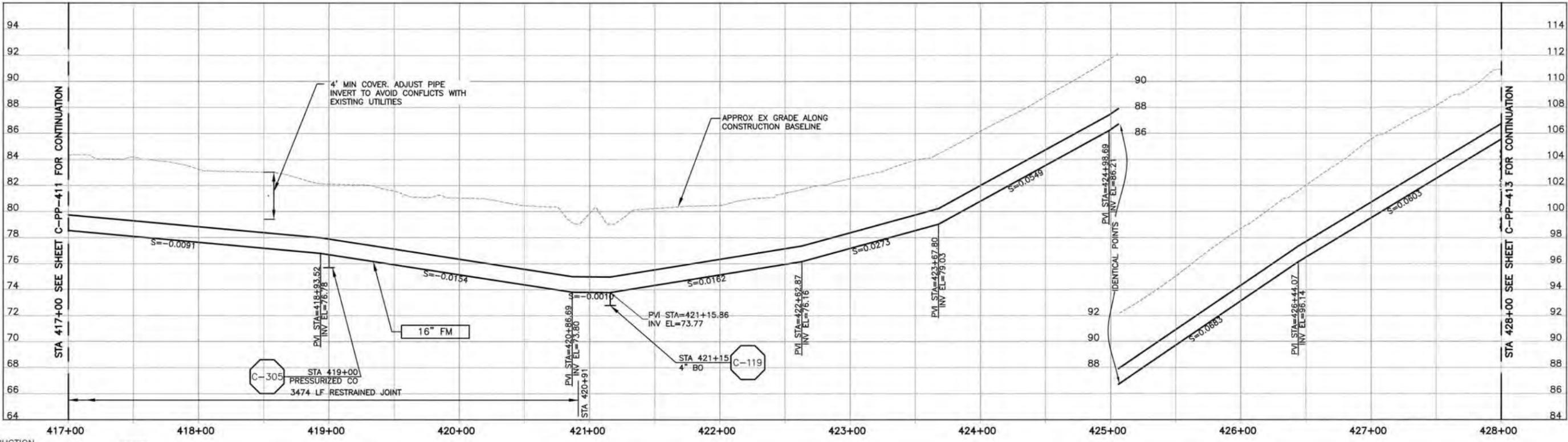
LOS OSOS WASTEWATER COLLECTION SYSTEM
PLAN AND PROFILE - FM
LOS OSOS VALLEY ROAD
STA 407+00 TO STA 417+00

PROJECT NO. 42502-83120
FILE NAME: C-PP-411
SHEET NO.
C-PP-411

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

- NOTES:**
- NOMINAL FORCEMAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 18".
 - REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPE LINE.

3. MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

DESIGNED BY:	KS, RLA
DRAWN BY:	RU
CHECKED BY:	BJC
DATE:	APRIL 2012

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS, RLA
 DRAWN BY: RU
 CHECKED BY: BJC
 DATE: APRIL 2012

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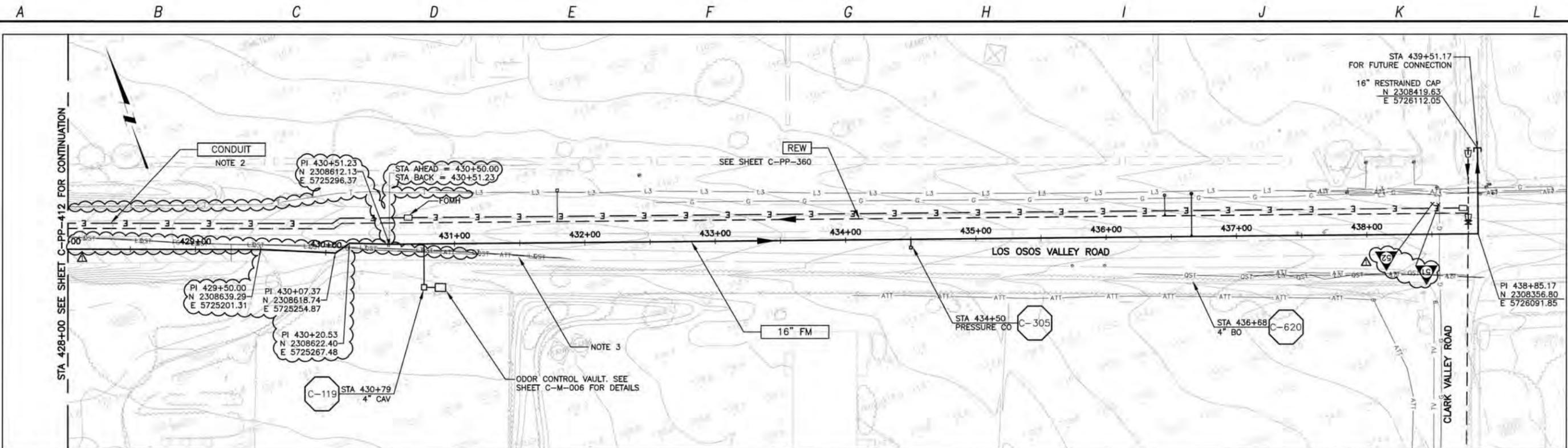


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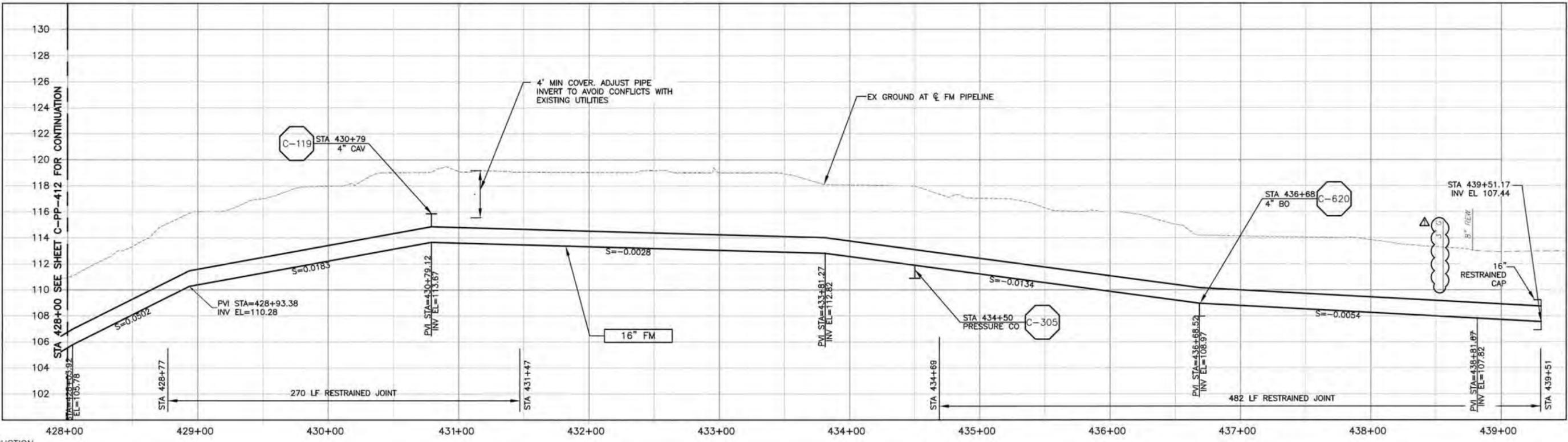
LOS OSOS WASTEWATER COLLECTION SYSTEM
 PLAN AND PROFILE - FM
 LOS OSOS VALLEY ROAD
 STA 417+00 TO STA 428+00

PROJECT NO. 42502-8312G
 FILE NAME: C-PP-412
 SHEET NO.
C-PP-412

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PLAN ON LOS OSOS VALLEY ROAD



PROFILE ON LOS OSOS VALLEY ROAD

- NOTES:
- NOMINAL FORCEMAIN PIPE SIZE CALLOUT IS FOR PVC PIPE MATERIAL. IF HDPE IS UTILIZED, NOMINAL PIPE SIZE SHALL BE 18".

- REFER TO SHEET C-G-010 FOR REQUIREMENTS OF ELECTRICAL CONDUITS AND MANHOLES ALONG THE PIPE LINE.
- MAINTAIN 2' VERTICAL AND HORIZONTAL SEPARATION FROM THE AT&T CONDUIT MANHOLES.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/18/12	LLB	RLA		ADDENDUM #1

DESIGNED BY: KS,RLA
 DRAWN BY: RU
 CHECKED BY: BJC
 DATE: APRIL 2012

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 Sacramento, CA 95833
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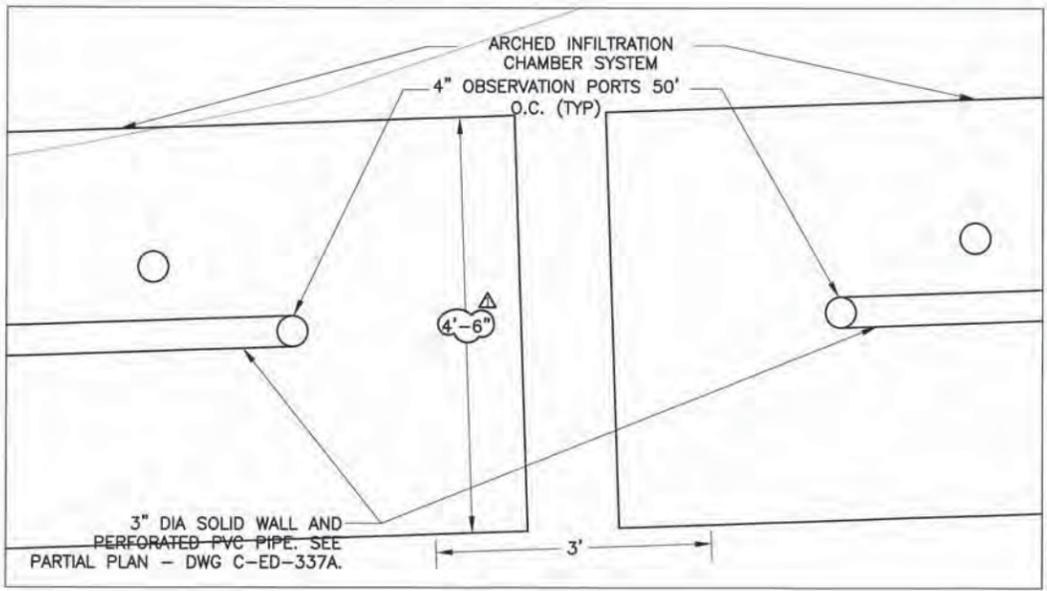
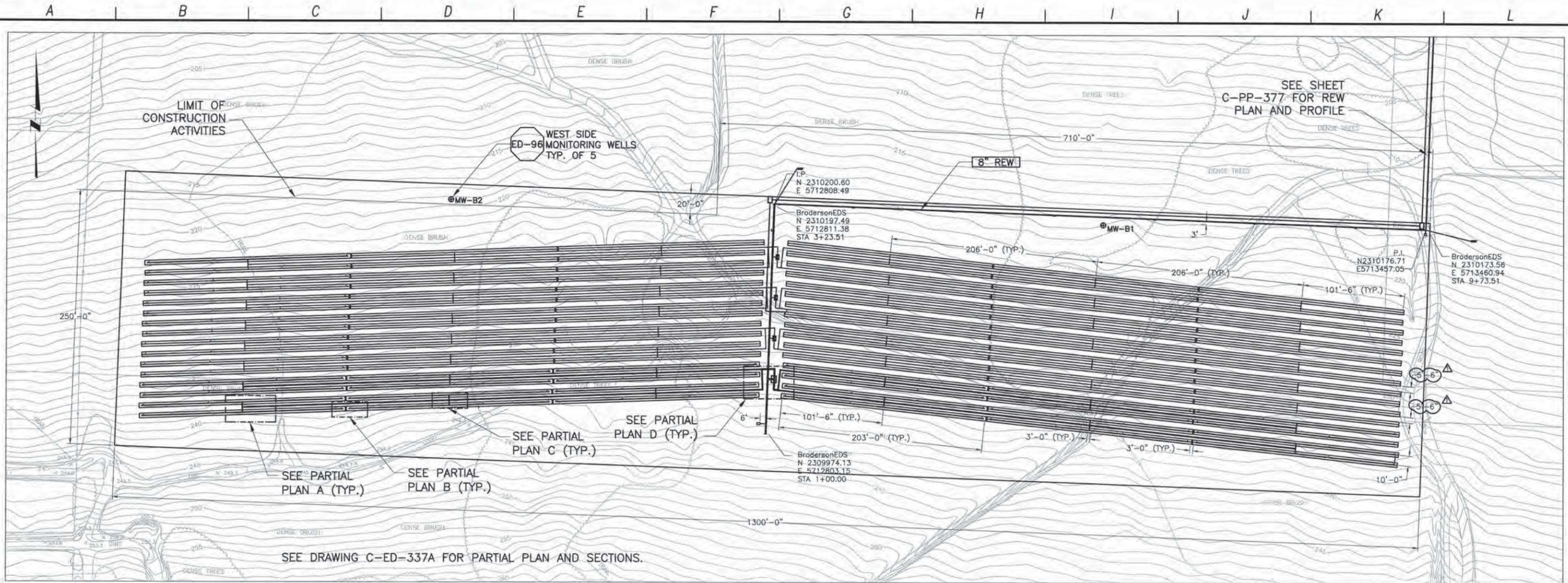


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LOS OSOS WASTEWATER COLLECTION SYSTEM
PLAN AND PROFILE - FM
 LOS OSOS VALLEY ROAD
 STA 428+00 TO STA 439+51.17

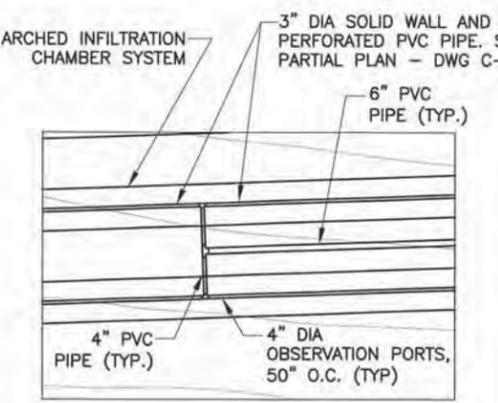
PROJECT NO. 42502-83120
 FILE NAME: C-PP-413
 SHEET NO. C-PP-413

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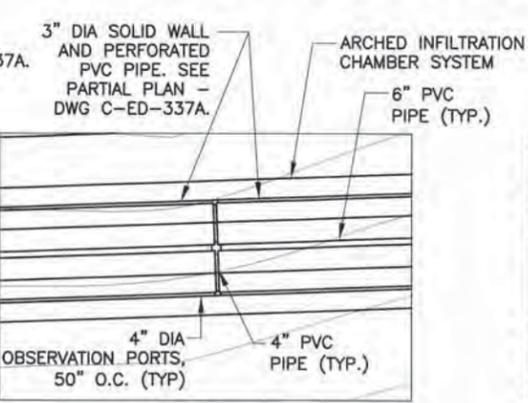


PARTIAL PLAN B
SCALE: 1"=1'

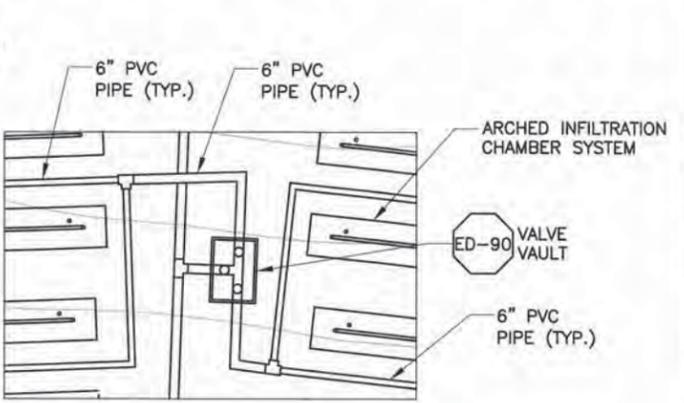
BRODERSON EDS PLAN
SCALE: 1"=50'



PARTIAL PLAN A
SCALE: 1"=10'



PARTIAL PLAN C
SCALE: 1"=10'



PARTIAL PLAN D
SCALE: 1"=10'

NOTE:
ALL TREES, SHRUBS, AND THEIR ROOT STRUCTURES SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR DURING THE CLEARING AND GRUBBING OF THE SITE. EUCALYPTUS TREES TO BE REMOVED BETWEEN SEPT. 1 AND FEB. 1, IF POSSIBLE. COORDINATE TREE REMOVAL WITH COUNTY BIOLOGIST AS ADDITIONAL EUCALYPTUS TREES SOUTH OF THE LEACHFIELD AREA ARE TO BE REMOVED AS INDICATED IN THE PROJECT'S HABITAT MANAGEMENT PLAN. TREES REMOVED SHOULD BE CHIPPED AND STORED ON SITE FOR FUTURE USE AS REVEGETATION MULCH.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5/24/12	LLB	RLA		ADDENDUM #2

DESIGNED BY: RLA
 DRAWN BY: MAR
 CHECKED BY: RLA
 DATE: APRIL 2012

CDM Smith
2295 Gateway Oaks Drive, Suite 240
Sacramento, CA 95833
Tel: (916) 567-9900



0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY



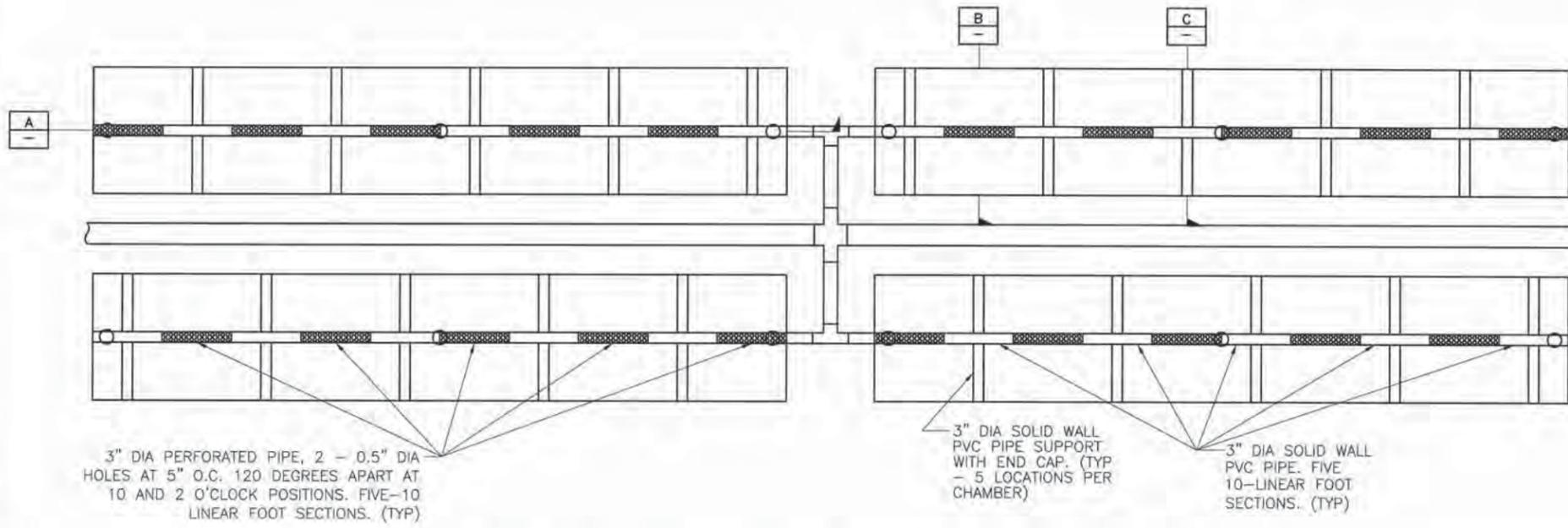
DIGALERT
DIAL TOLL FREE 1-800-642-2444
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF NORTHERN CALIFORNIA

LOS OSOS WASTEWATER COLLECTION SYSTEM
EFFLUENT DISPOSAL SYSTEM
BRODERSON EDS PLANS

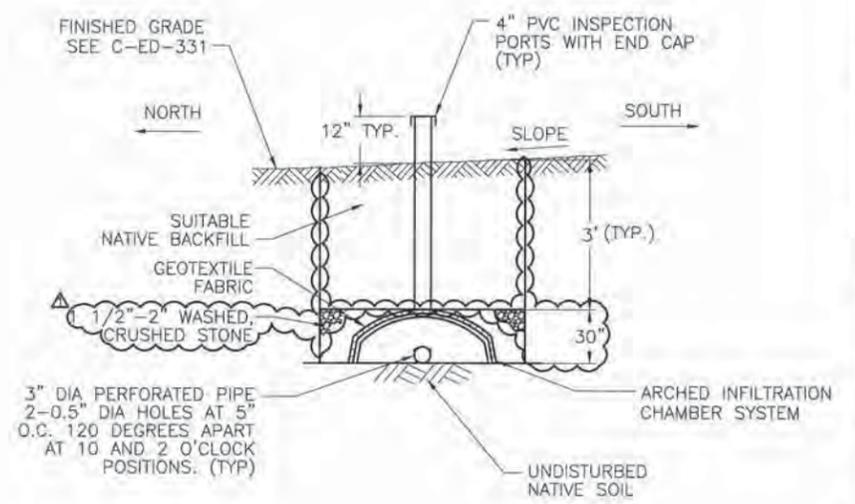
PROJECT NO. 42502-83120
 FILE NAME: C-ED-330
 SHEET NO.
C-ED-330

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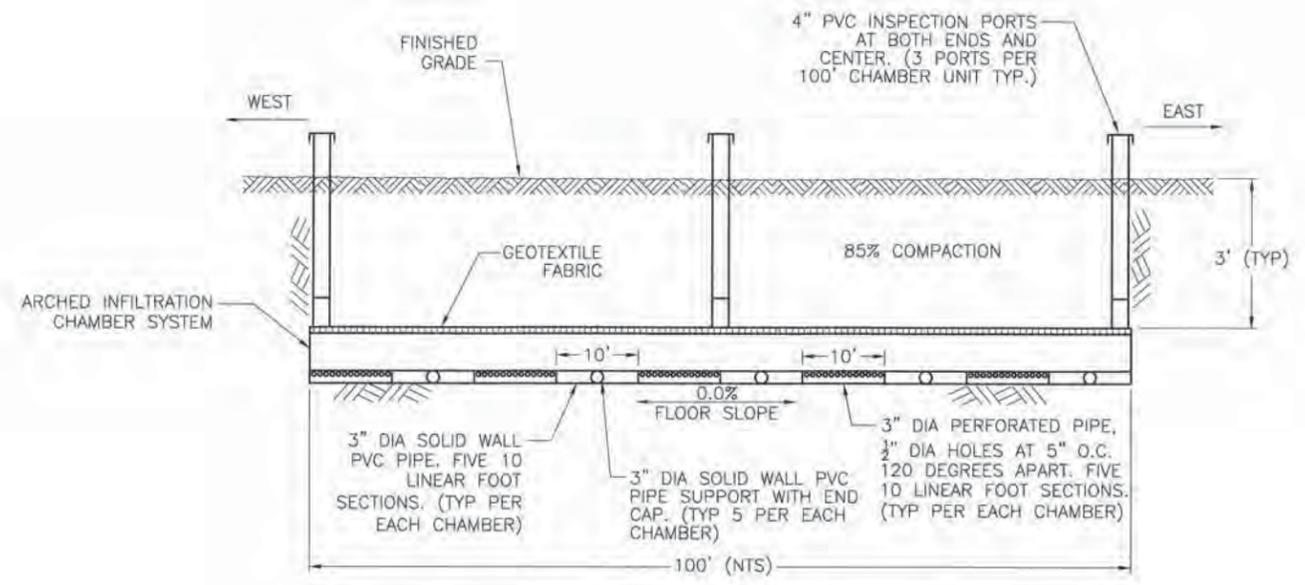
A B C D E F G H I J K L



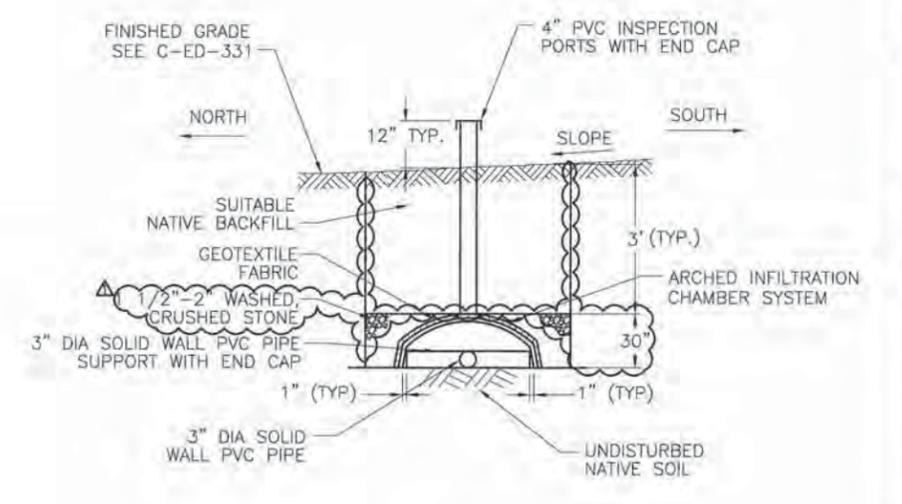
PERCOLATION TRENCH PARTIAL PLAN (REFER TO DRAWING C-ED-330)



PERCOLATION TRENCH CROSS SECTION B
N.T.S.



PERCOLATION TRENCH LONGITUDINAL SECTION A
N.T.S.



PERCOLATION TRENCH CROSS SECTION C
N.T.S.

NOTE: ALTERNATE SECTIONS OF SOLID WALL AND PERFORATED PIPE IN CHECKERBOARD PATTERN FOR EACH ROW OF CHAMBERS.

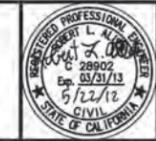
REV. NO.	DATE	DRWN	CHKD	REMARKS
5/24/12	LLB	RLA		ADDENDUM #2

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0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY



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LOS OSOS WASTEWATER COLLECTION SYSTEM
EFFLUENT DISPOSAL SYSTEM
 EDS SECTIONS AND DETAILS 1A

PROJECT NO. 42502-B3120
 FILE NAME: C-ED-337A
 SHEET NO.
C-ED-337A