

PROJECT LOCATION

NO SCALE

Site # 2
Highway One Culvert
See Sheets 2 & S-2

Site # 1
Cuesta College Diversion Dam
See Sheets 6 & S-3

Site # 3
Rancho El Chorro Diversion Dam
See Sheets 3 & S-3

Site # 4
Rancho El Chorro Culverts
See Sheets 4,5 & S-1

EL CHORRO REGIONAL PARK

CUESTA COLLEGE

CAMP SAN LUIS OBISPO

BASIS OF BEARING AND OF ELEVATION:

HORIZONTAL AND VERTICAL CONTROL IS BASED ON "GPS SURVEY CONTROL OF CHORRO VALLEY PIPELINE PROJECT" BY VAUGHAN SURVEYS DONE MARCH 1993. THE CONTROL POINTS HELD ON THAT SURVEY WERE POINTS 17,18,34, AND 35. THAT SURVEY IS BASED CALIFORNIA HPGN (HORIZONTAL DATUM :1983 W/ 1991 ADJUSTMENT : VERTICAL DATUM 1988)

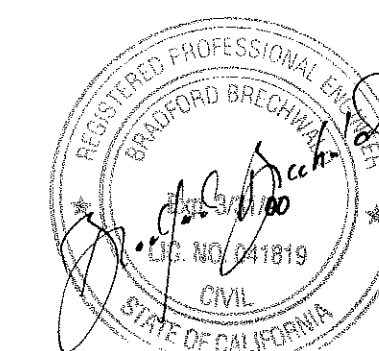
NOTE: ALL WORK IN THE CREEK AND EXISTING CALTRAN'S CULVERT TO COMPLY WITH THE SPECIFICATIONS AND REQUIREMENTS OF ALL APPLICABLE PERMITS (CALTRANS, DFG, DFW, ARMY CORPS, WCB ETC...)

PROJECT VICINITY MAP

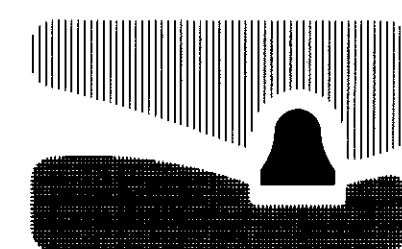
NO SCALE

RECORD DRAWING

DATE: December 1999 BY: gmm

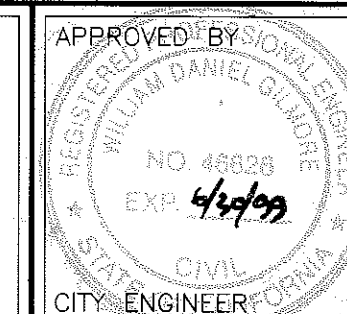


THIS PROJECT HAS BEEN FUNDED IN PART BY WILDLIFE CONSERVATION BOARD GRANT AGREEMENT NO. WC-0702 IN THE AMOUNT OF \$30,000.00 TO THE CITY OF SAN LUIS OBISPO. THE CONTENTS OF THIS DOCUMENT DO NOT NECESSARILY REFLECT THE VIEWS AND POLICIES OF THE WILDLIFE CONSERVATION BOARD, NOR DOES MENTION OF TRADE NAMES OR COMMERCIAL PRODUCTS CONSTITUTE ENDORSEMENT OR RECOMMENDATION FOR USE.



city of san luis obispo

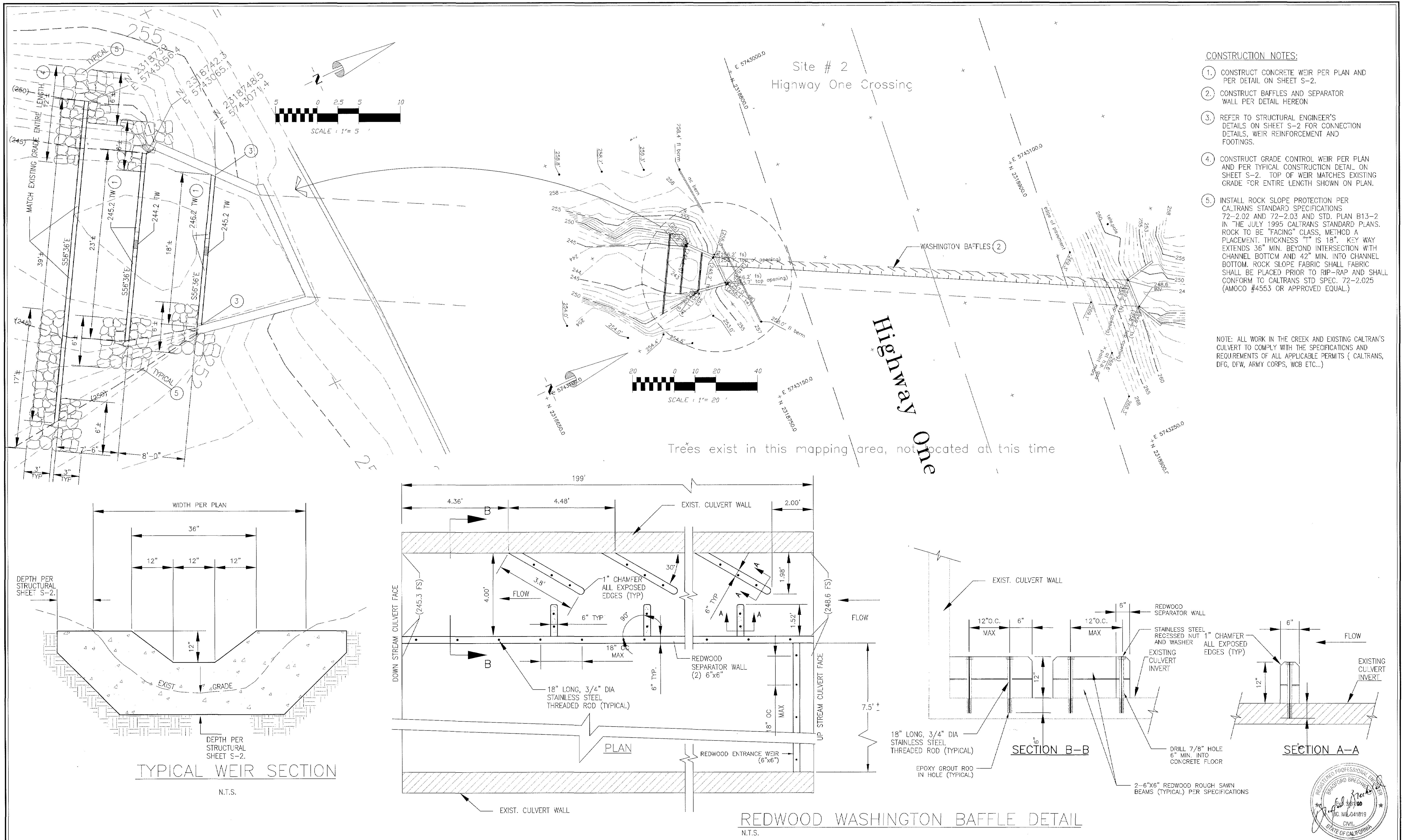
Title Sheet & Location Map
Pennington Creek
Riparian Enhancement Project

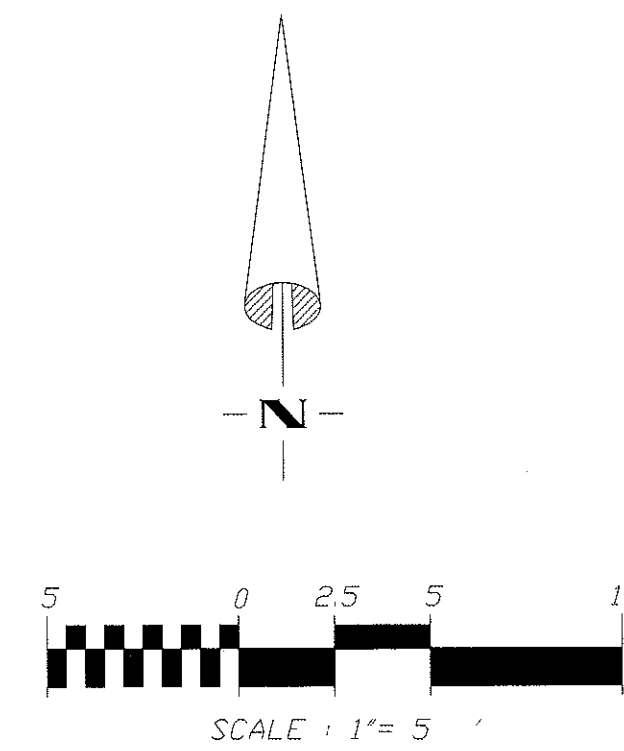


DATE: 8-4-97
SCALE: 1"=50' SCALE
DESIGNED BY: GAR
DRAWN BY: CD
CHECKED BY:
APPROVED BY: W.D. Gaudreault
CITY ENGINEER

JLWA John L. Wallace & Associates
Civil Engineering · Surveying · Planning
4115 So. Broad St B5 San Luis Obispo, Ca
(805)544-4011 FAX 544-4294

SPECIFICATION NO.
95-28
FILE NO./LOCATION
CREEK3.DWG
SHEET
1 OF 10





6" GALVANIZED STEEL PIPE

CONCRETE BACKFILL PER NOTE 3 SHEET S-4

LIMITS OF ROCK EXCAVATION

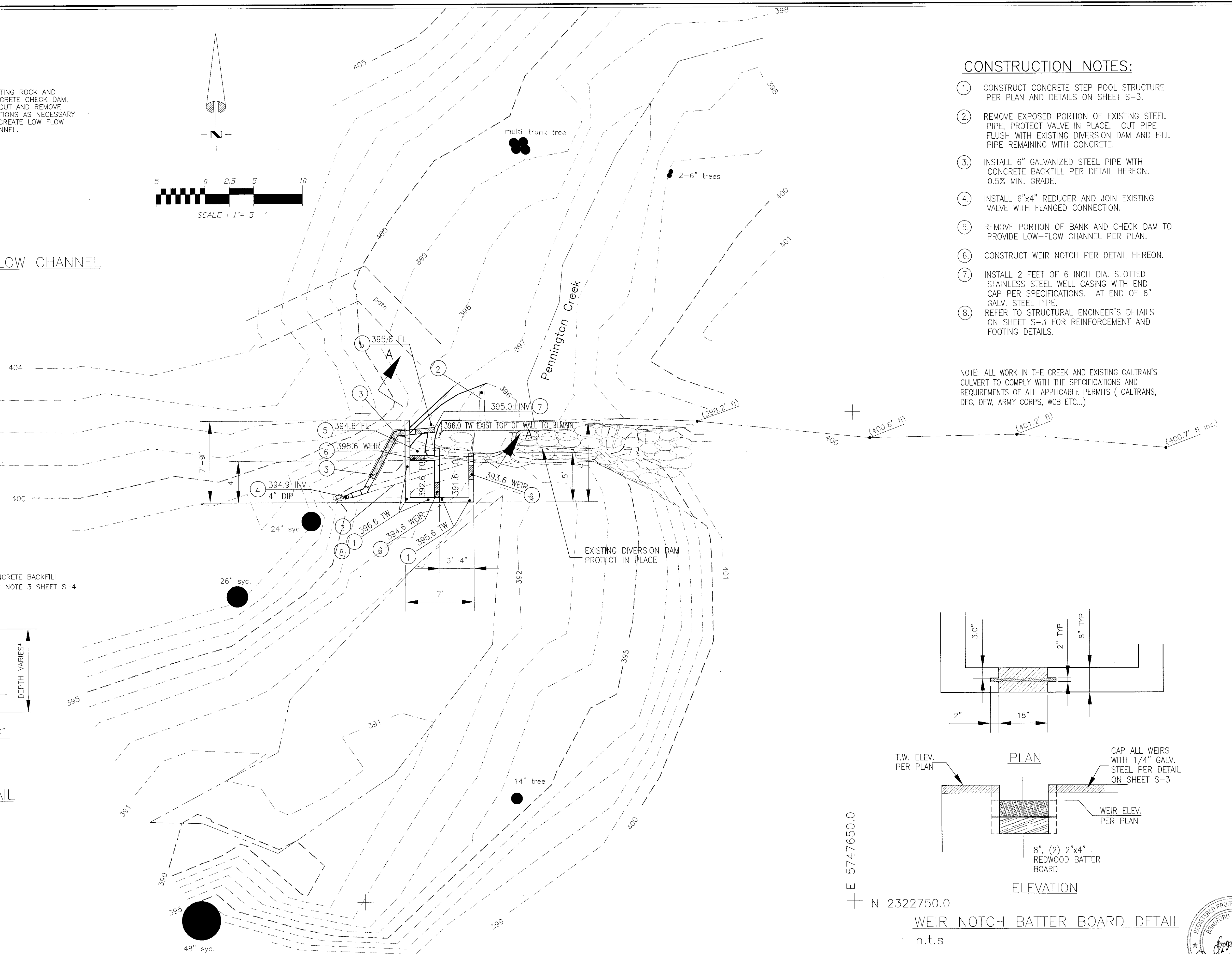
DEPTH VARIES*

12"

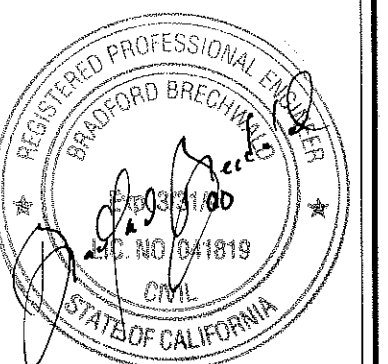
3"

395

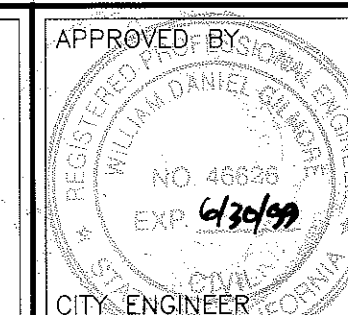
— E 5747550.0
N 2322750.0



WEIR NOTCH BATTER BOARD DETAIL
n.t.s



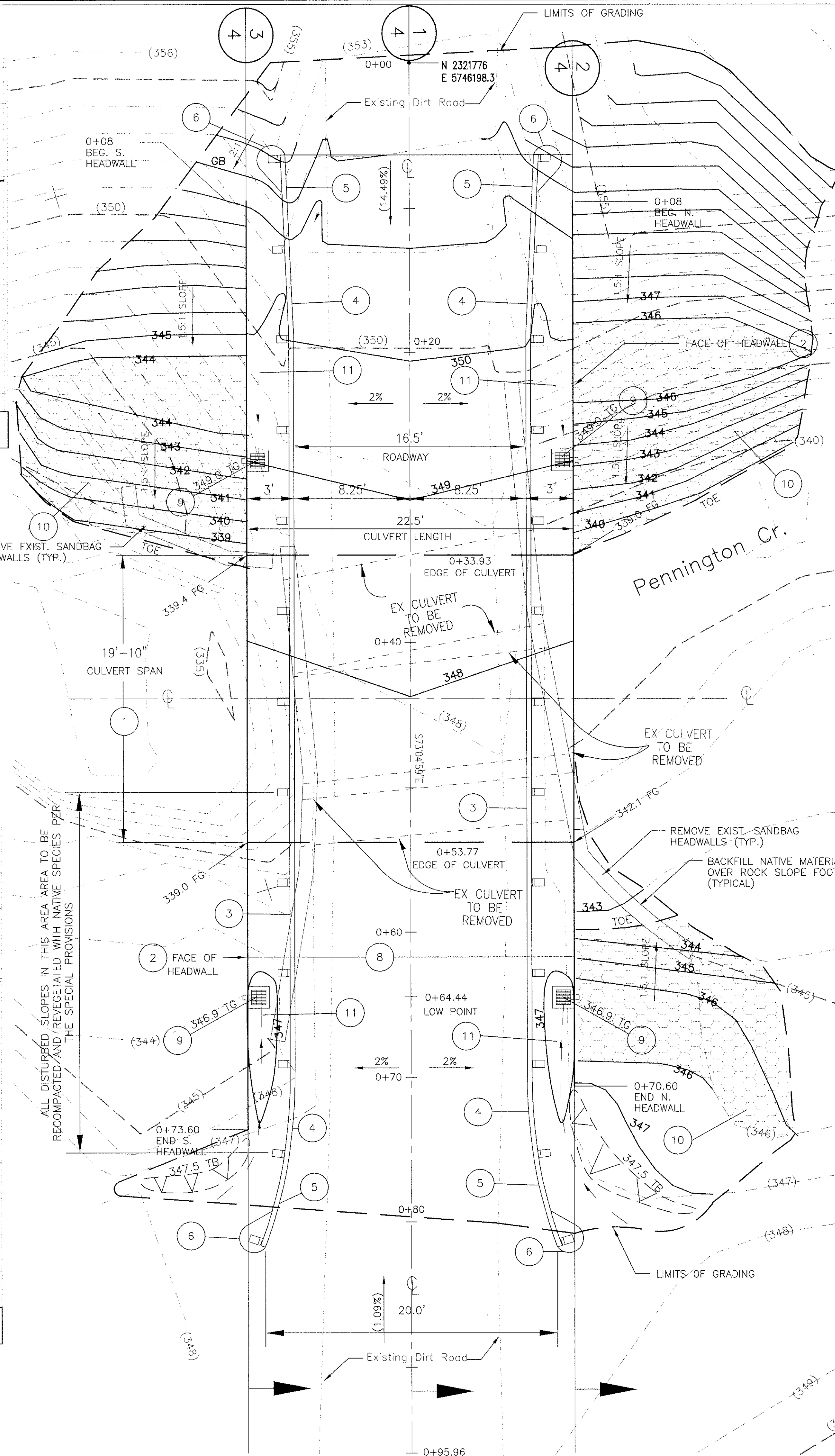
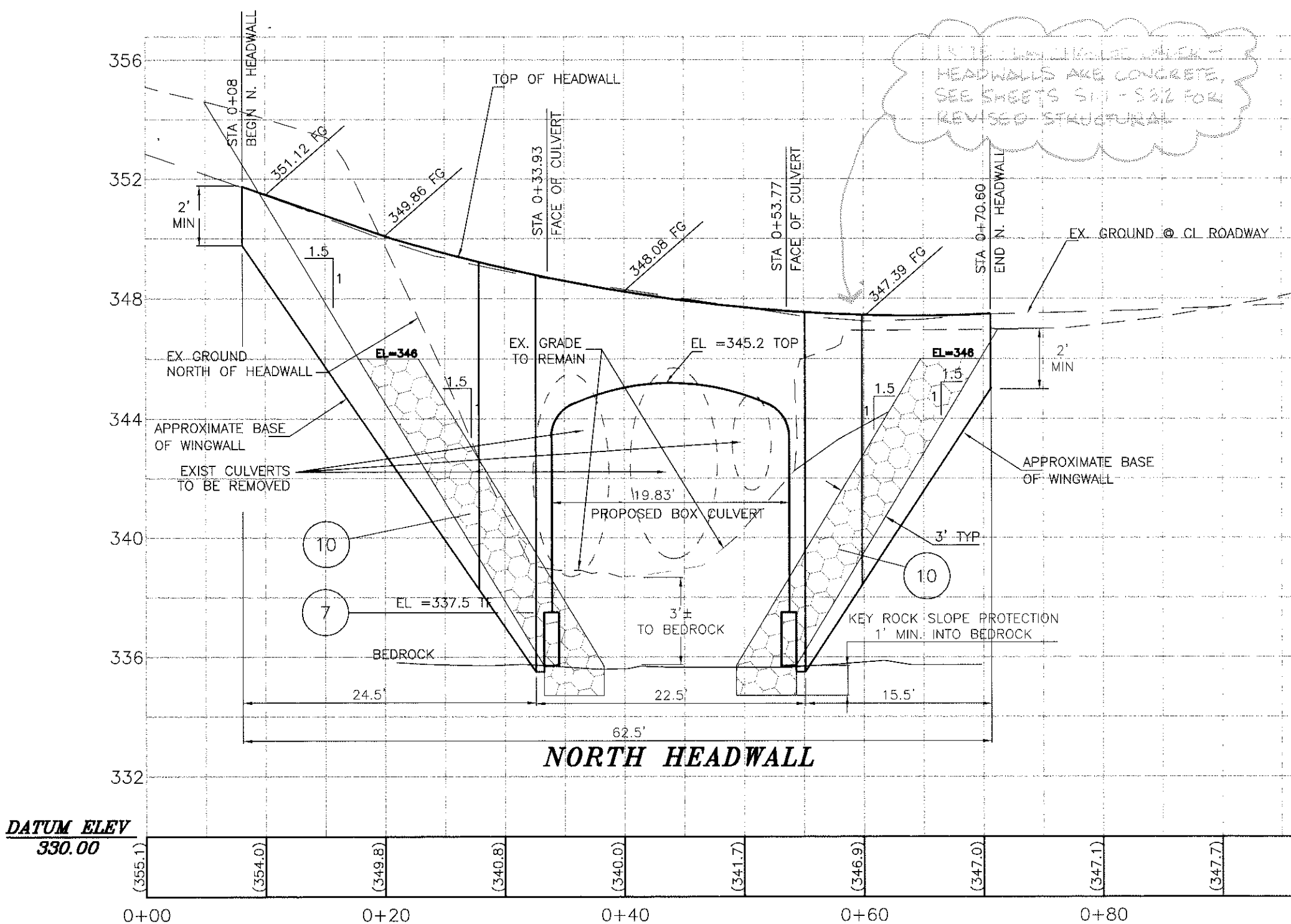
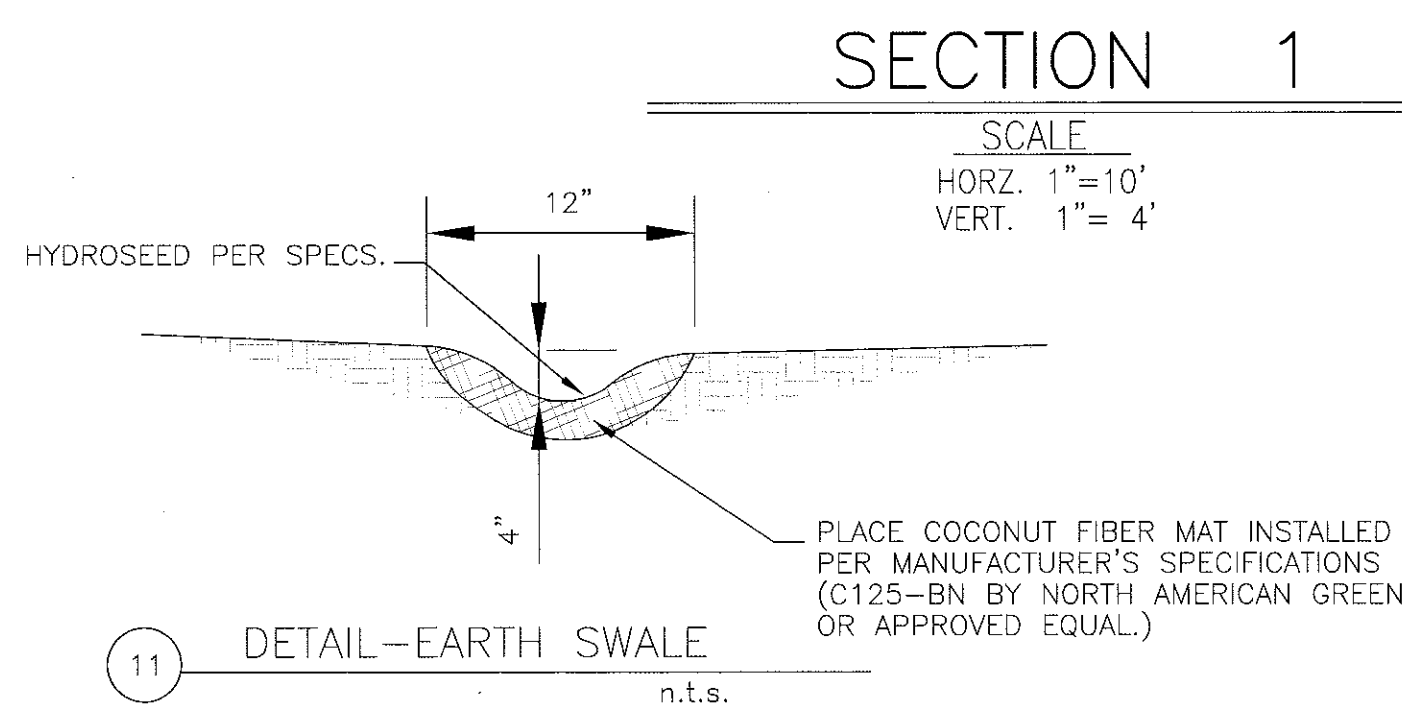
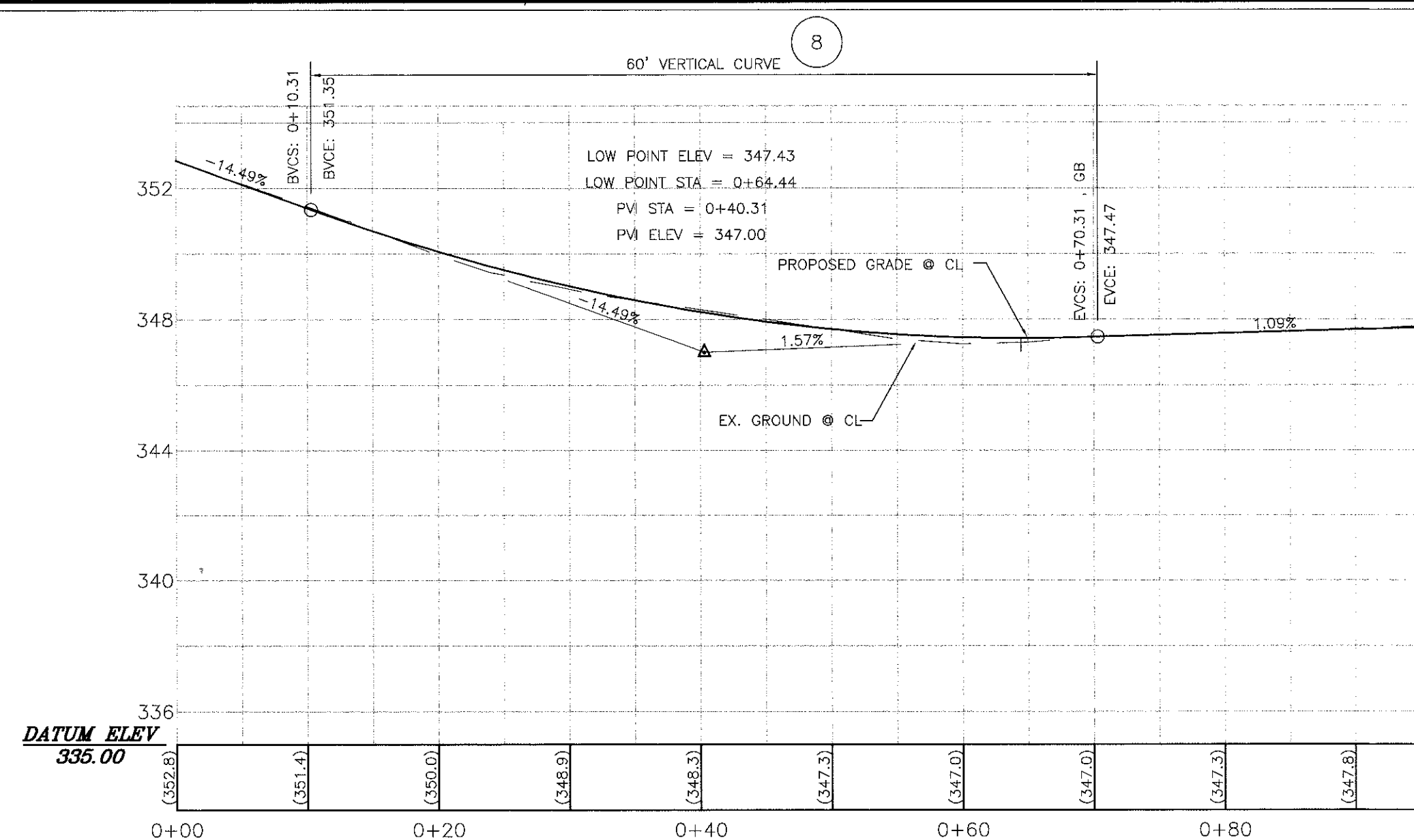
Plan & Details
Site Three: Rancho El Chorro Diversion Dam
Pennington Creek
Riparian Enhancement Project



DATE	8-4-97
SCALE	1:5
DESIGNED BY	GAR
DRAWN BY	CD
CHECKED BY	
APPROVED BY	<i>[Signature]</i>

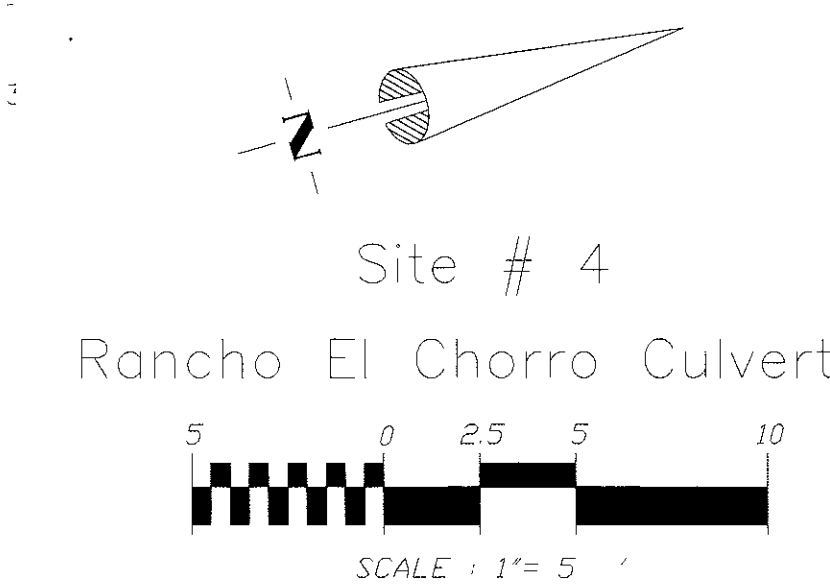
JLWA **John L. Wallace & Associates**
Civil Engineering · Surveying · Planning
4115 So. Broad St B5 San Luis Obispo, Ca
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SPECIFICATION NO.
 5-28
 FILE NO./LOCATION
 REEK3.DWG
 SHEET
 OF 10



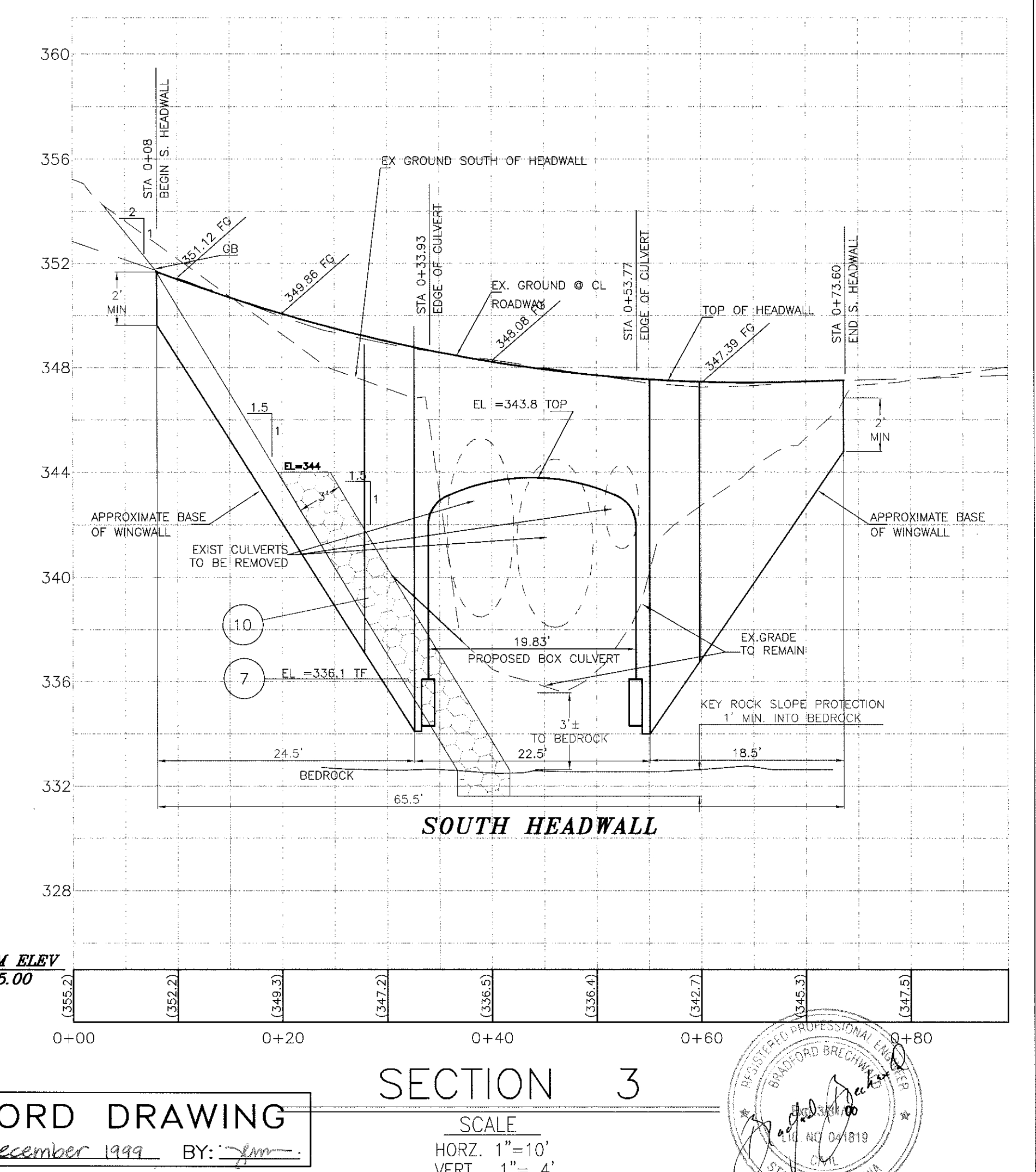
GENERAL NOTES

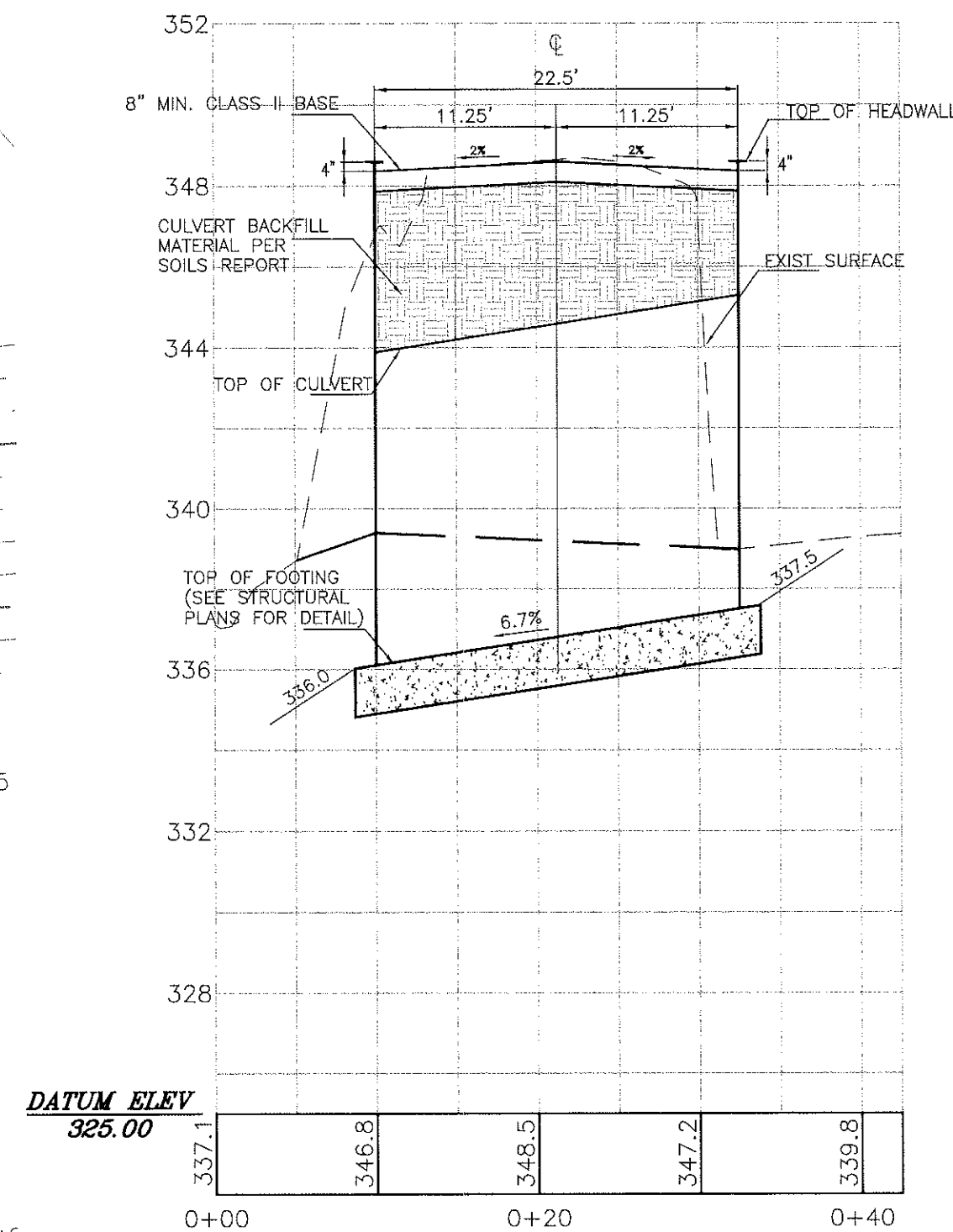
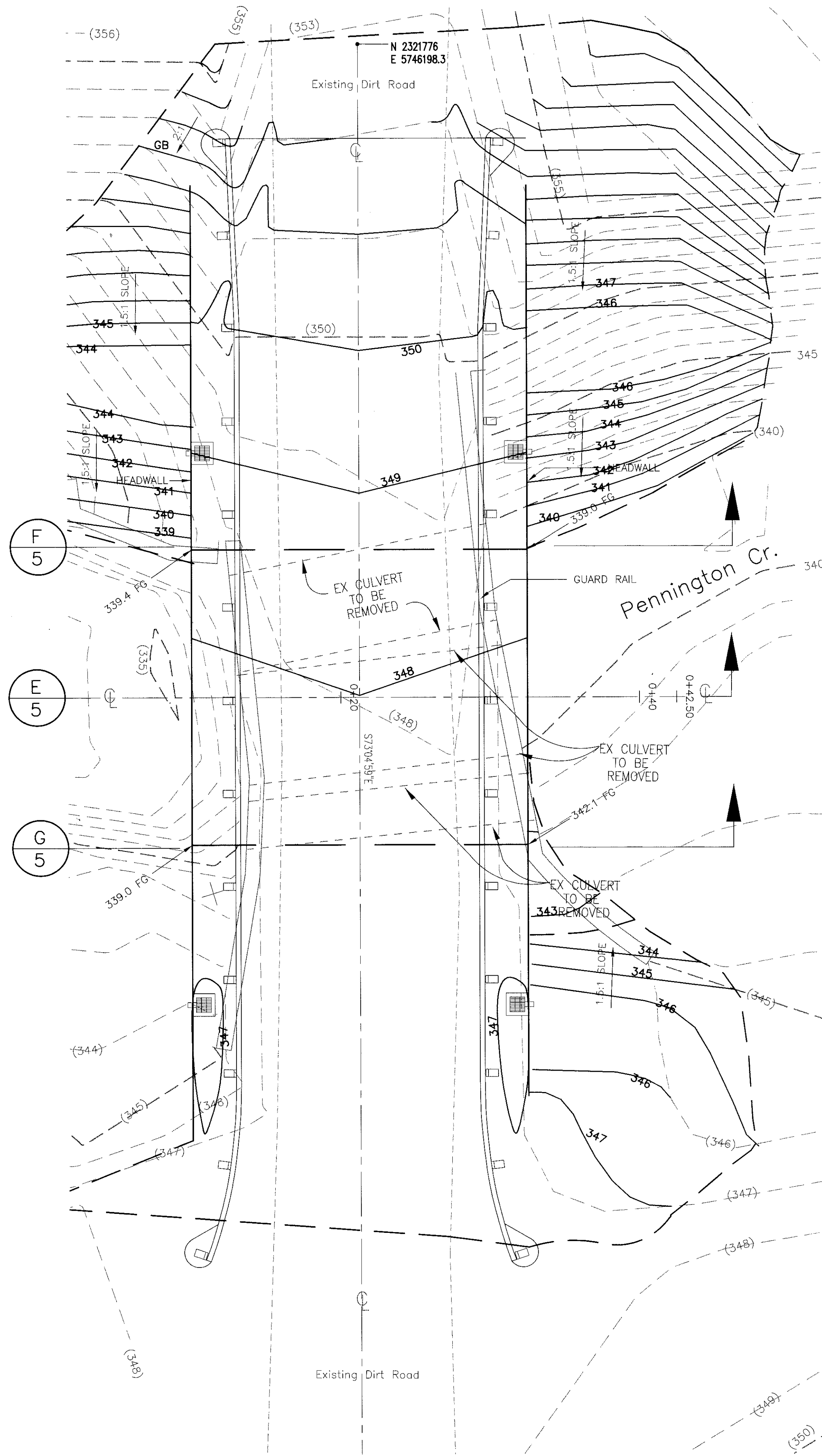
- ALL WORK IN THE CREEK AND EXISTING CALTRAN'S CULVERT TO COMPLY WITH THE SPECIFICATIONS AND REQUIREMENTS OF ALL APPLICABLE PERMITS (CALTRANS, DFC, DFW, ARMY CORPS, WCB ETC...)
- ENGINEER'S STAMPS INCLUDED IN THIS DRAWING SET SPECIFICALLY EXCLUDE THE STRUCTURAL DESIGN OF THE BOX CULVERT AND HEADWALL. CONTRACTOR TO PROVIDE THE CITY OF SAN LUIS OBISPO PUBLIC WORKS DEPARTMENT WITH SHOP DRAWINGS SIGNED BY A LICENSED STRUCTURAL ENGINEER FOR THE STRUCTURAL DESIGN OF THE BOX CULVERT AND HEADWALLS.
- CONTRACTOR SHALL APPLY SLOPE FABRIC AND HYDROSEEDING TO ALL DISTURBED SLOPES OTHER THAN ROCK PER SPECIAL PROVISIONS AND MANUFACTURER'S RECOMMENDATIONS.



CONSTRUCTION NOTES

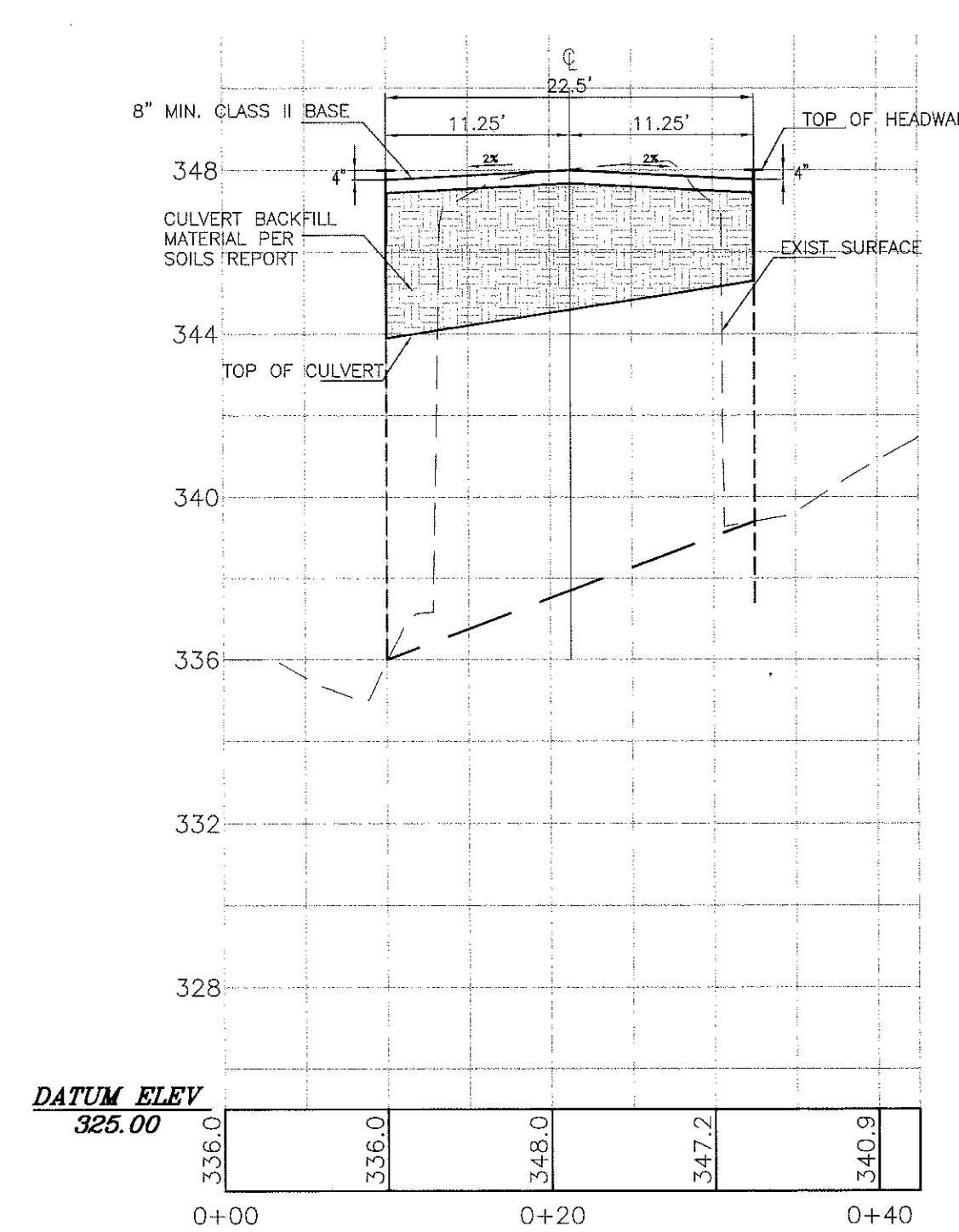
- INSTALL 19'-10" SPAN, 7'-8" RISE ALUMINUM BOX CULVERT, CONTECH STRUCTURE NO. 45-B OR ENGINEER APPROVED EQUAL PER PLAN, SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS
- INSTALL ALUMINUM STRUCTURAL PLATE TIE-BACK HEADWALLS AND WINGWALLS, CONTECH STRUCTURE NO. 45 OR ENGINEER APPROVED EQUAL PER PLAN, SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT INTO SOIL IS 2'. GREATER EMBEDMENT MAY BE REQUIRED DEPENDING ON SITE CONDITIONS AT THE TIME OF EXCAVATION. IF BEDROCK IS ENCOUNTERED WITHIN THE 2' LIMIT, HEADWALL MAY BE PLACED IN A GROUTED CHANNEL 18" MIN. IN DEPTH.
- INSTALL METAL THREE BEAM GUARDRAIL PER CALTRAN'S STD. DWG. A77-F ON 6"x8"x6'-0" DF POSTS AT 6'-3" O.C. ALL POSTS TO BE SET IN 24" MIN. DIA. CONCRETE FOOTINGS.
- INSTALL 6'-3" TRANSITION TO W-BEAM GUARDRAIL PER CALTRAN'S STD. DWG. A77-G.
- INSTALL 6'-3" W-BEAM GUARDRAIL WITH END ANCHORAGE PER CALTRAN'S STD. DWG. A77-G AND E.
- INSTALL TERMINAL SECTION TYPE-C PER CALTRAN'S STD. DWG. A77-E.
- CONSTRUCT CONCRETE FOOTINGS PER PLAN AND STRUCTURAL SHEET S-1. ACTUAL TOP OF FOOTING ELEVATION AND EMBEDMENT DEPTH MAY VARY DEPENDING ON SOILS ENGINEER'S RECOMMENDATIONS AT TIME OF EXCAVATION.
- CONSTRUCT 8" MIN. DEPTH CLASS II BASE ROADWAY PER SAN LUIS OBISPO CITY STD. SPECIFICATIONS.
- INSTALL 18"x18" CATCH BASIN, BROOK'S 1818 OR APPROVED EQUAL, WITH STEEL PARKWAY GRATE. CONNECT 4" SDR 35 PVC AND OUTLET THROUGH HOLE CUT IN ALUMINUM HEADWALL. EXTEND OUTLET 2" MIN. BEYOND FACE OF HEADWALL. SEAL PVC TO HEADWALL CONNECTION WITH GROUT.
- INSTALL ROCK SLOPE PROTECTION 1/2 TON CLASS, METHOD "A" PLACEMENT, PER CALTRANS STANDARD SPECIFICATIONS 72-2 AND DETAIL HEREON. BACK WITH WITH ROCK SLOPE PROTECTION FABRIC. NONWOVEN TYPE "B" PER CALTRANS STD SPEC 88.
- CONSTRUCT EARTH SWALE PER DETAIL HEREON.





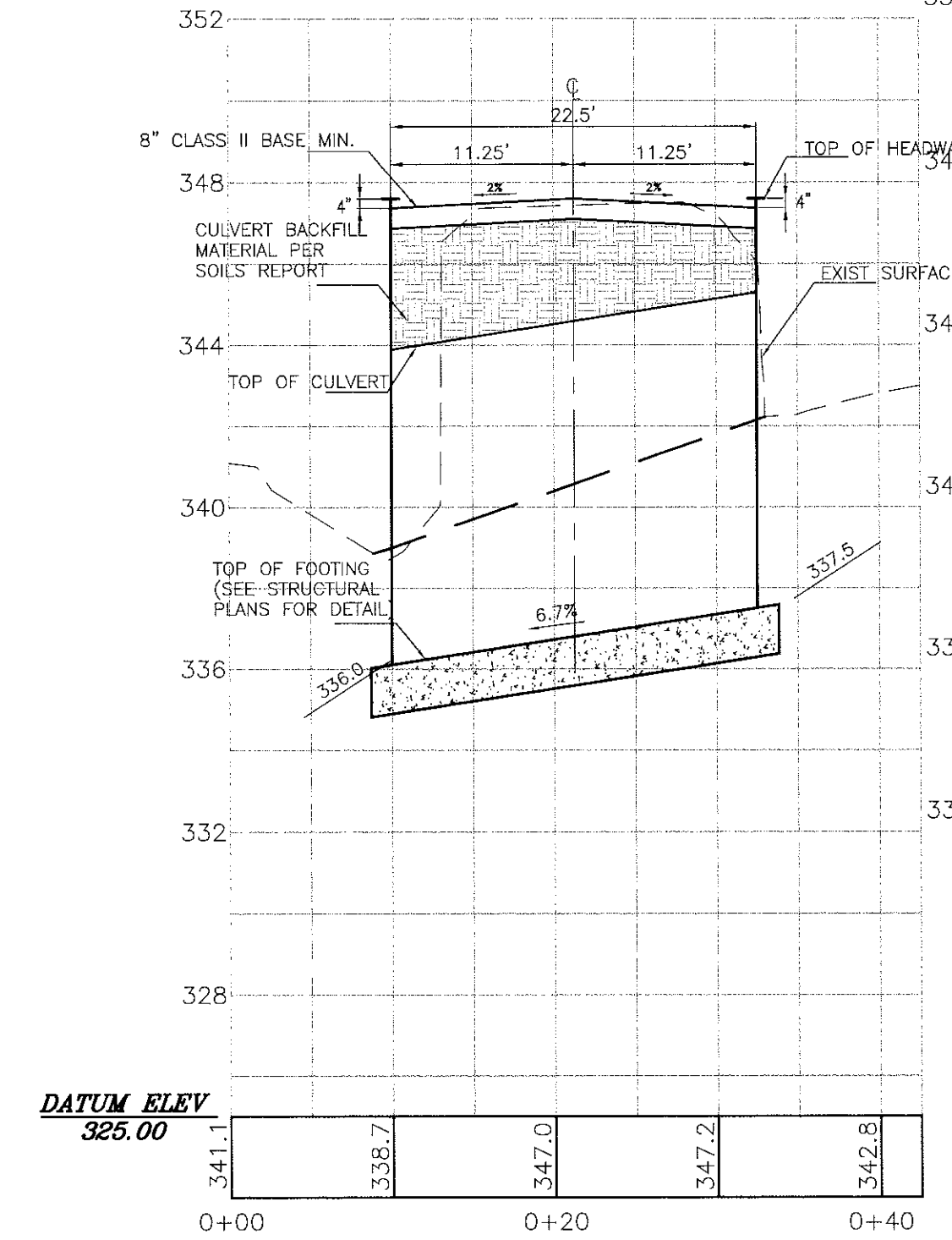
SECTION F

SCALE
HORZ. 1"=10'
VERT. 1"= 4'



SECTION E

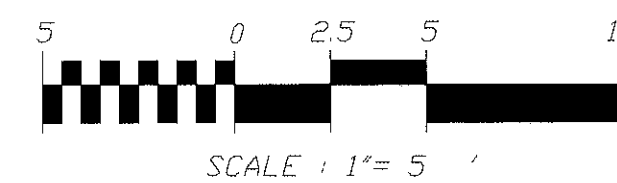
SCALE
HORZ. 1"=10'
VERT. 1"= 4'



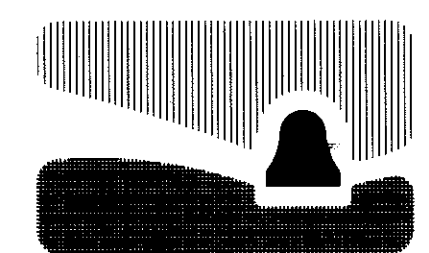
SECTION G

SCALE
HORZ. 1"=10'
VERT. 1"= 4'

Site # 4
Rancho El Chorro Culverts

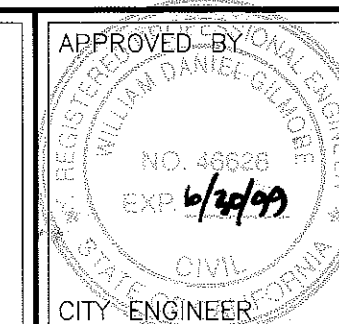


NOTE: SEE SHEET 4 FOR CONSTRUCTION NOTES



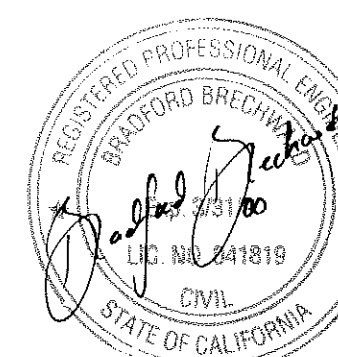
city of san luis obispo

Plan & Details
Site Four: Rancho El Chorro Culverts
Pennington Creek
Riparian Enhancement project

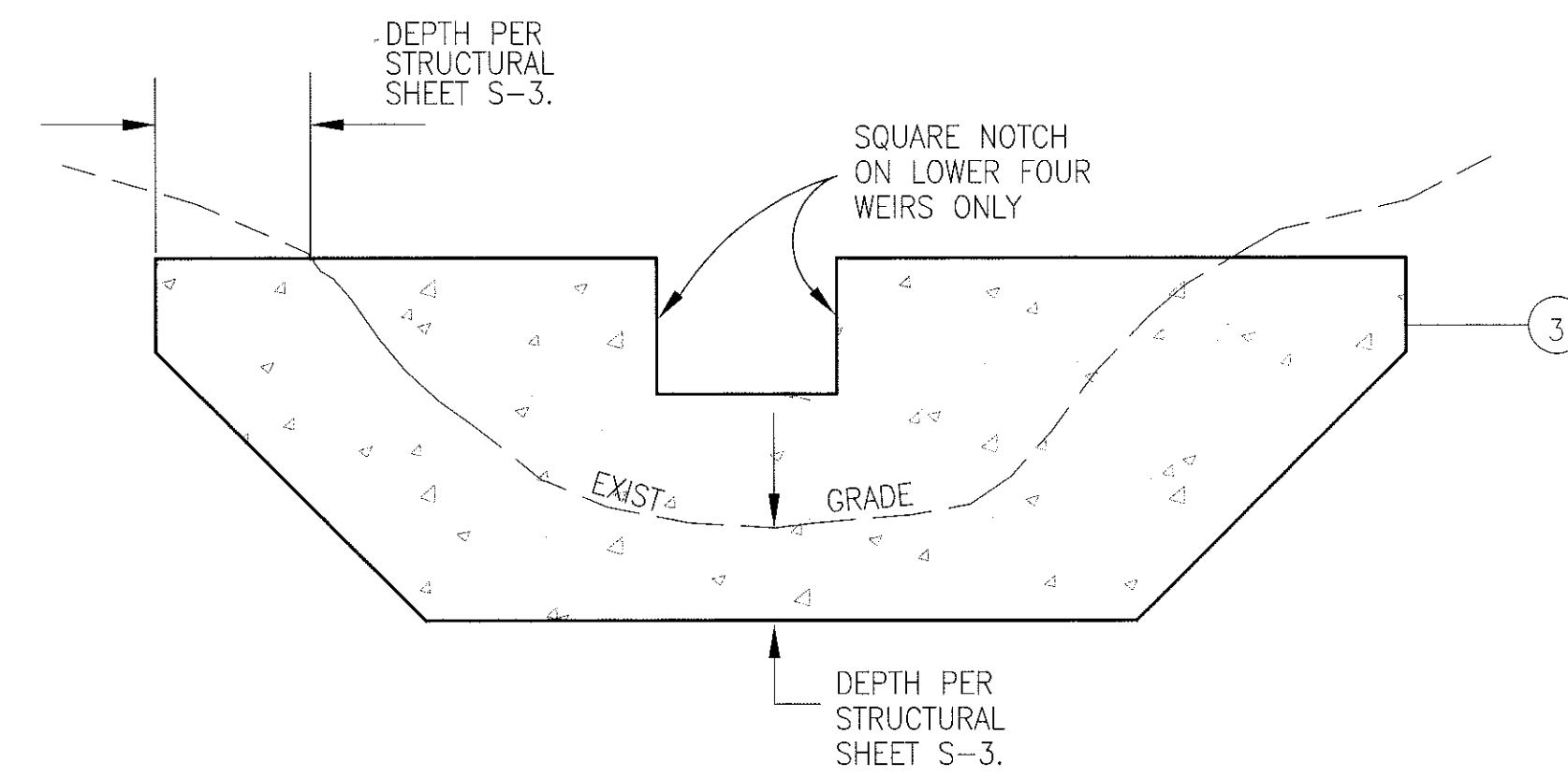


DATE 8-4-97
SCALE 1"=PER PLAN
DESIGNED BY GAR
DRAWN BY CD
CHECKED BY
APPROVED BY
CITY ENGINEER

JLWA John L. Wallace & Associates
Civil Engineering · Surveying · Planning
4115 So. Broad St B5 San Luis Obispo, Ca
(805)544-4011 FAX 544-4294

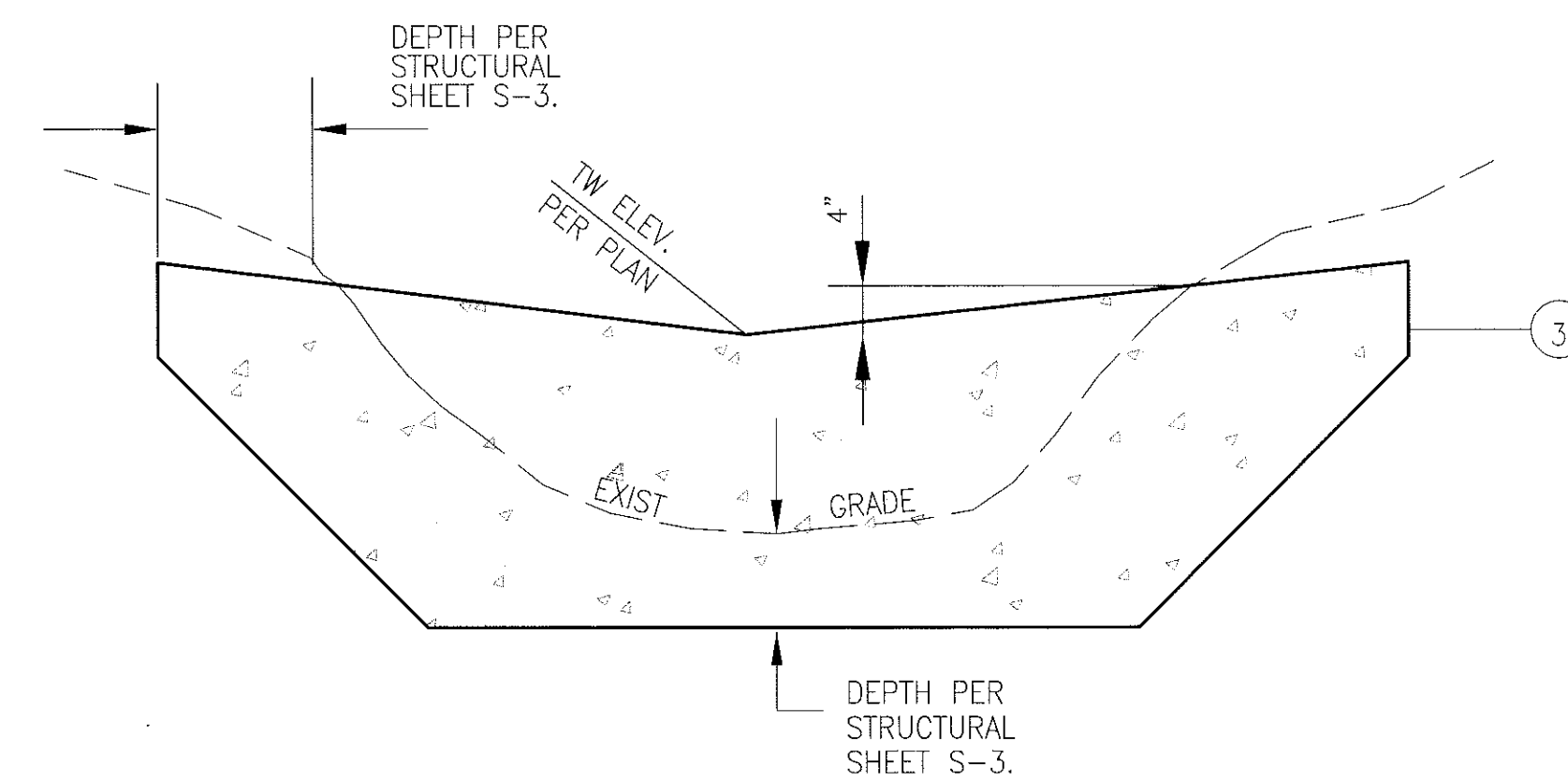


SPECIFICATION NO.
95-28
FILE NO./LOCATION
CREEK3.DWG
SHEET
5 OF 10



TYPICAL SECTION TYPE I WEIRS

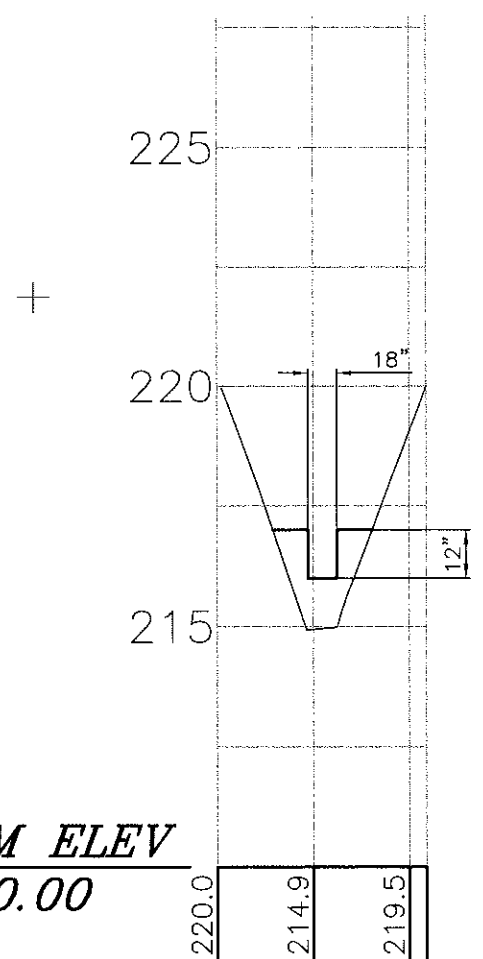
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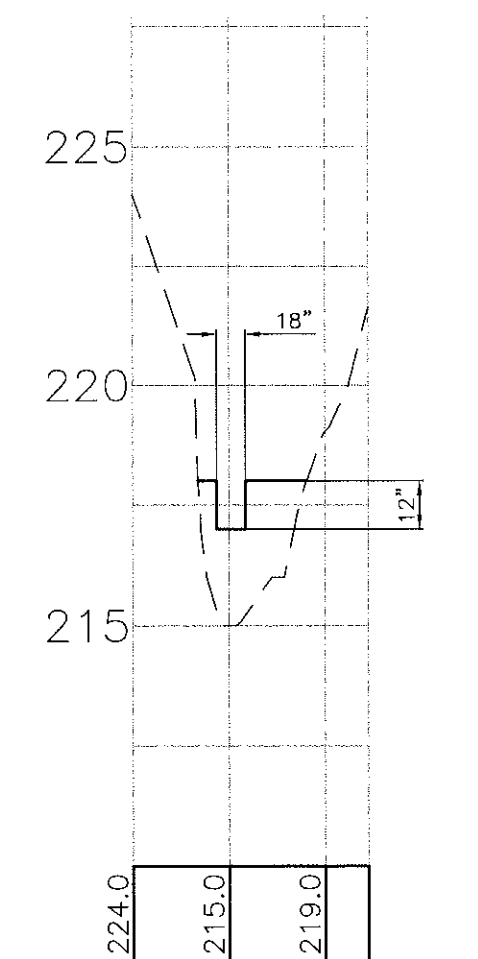
TYPICAL SECTION TYPE II WEIRS

N.T.S.

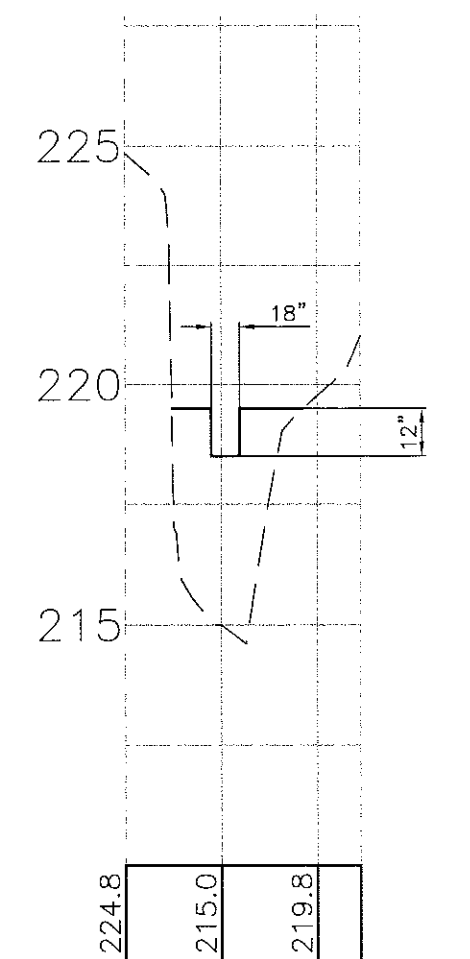
SECTION A



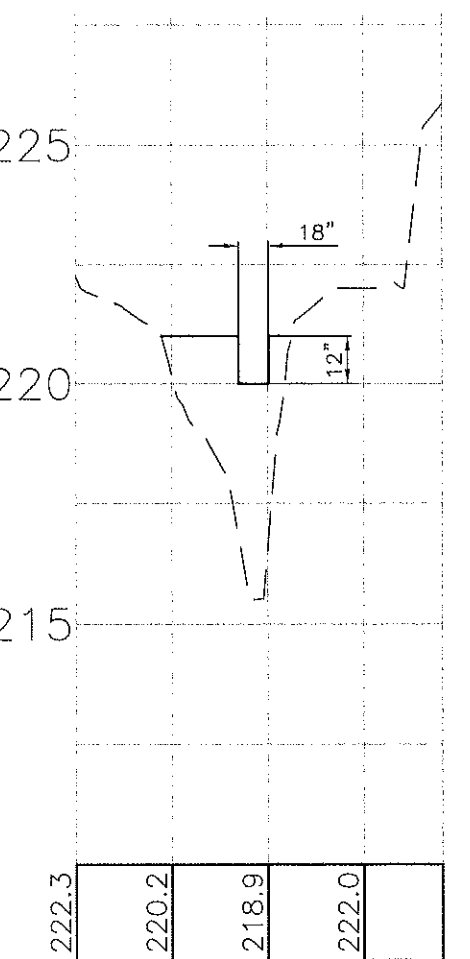
SECTION B



SECTION C

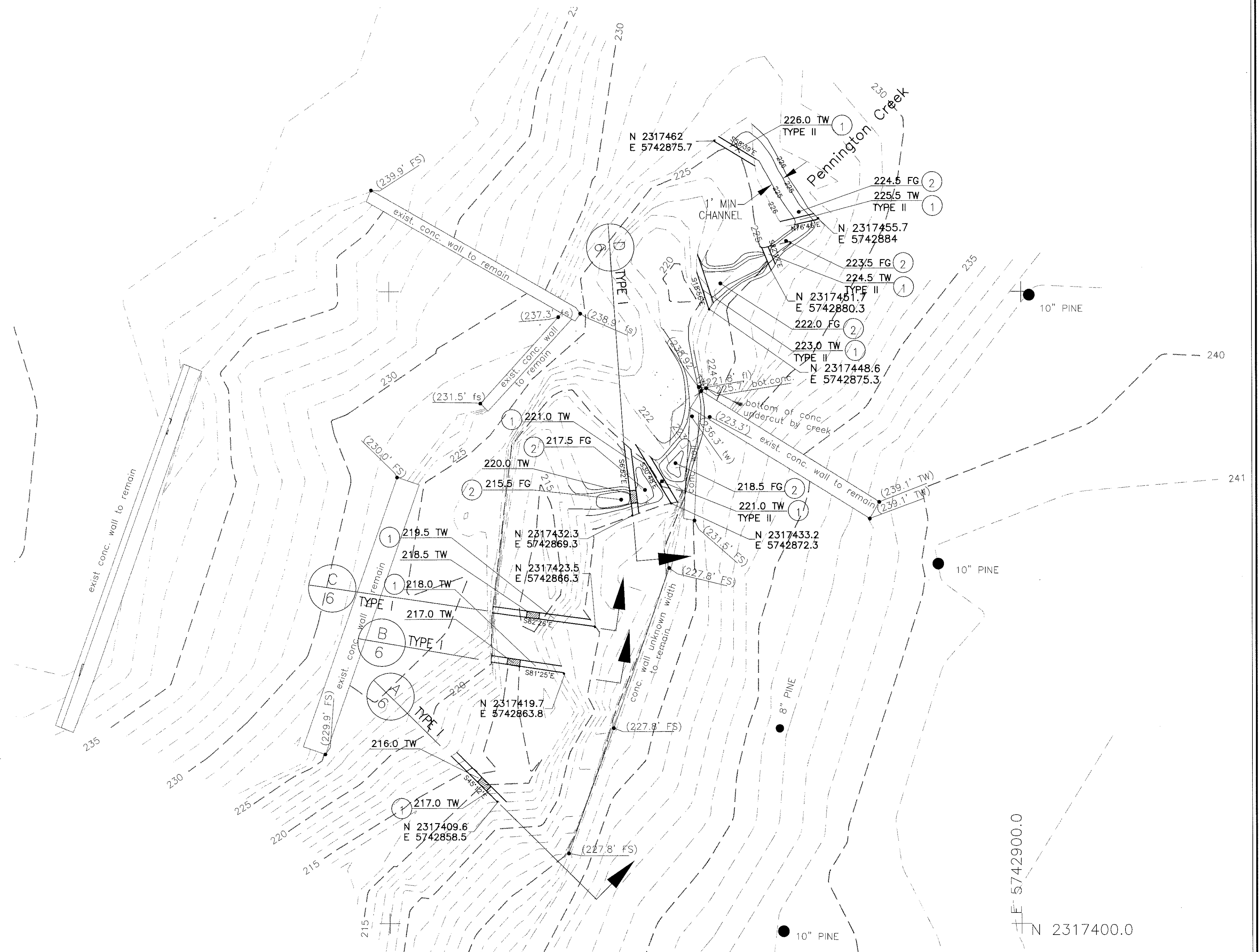


SECTION D



DATUM ELEV
210.00

SCALE
HORZ. 1"=10'
VERT. 1"=4'

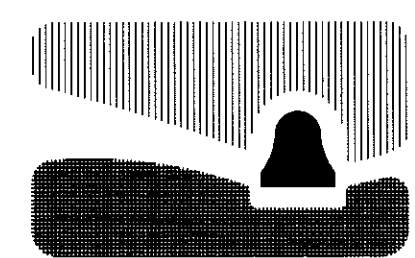
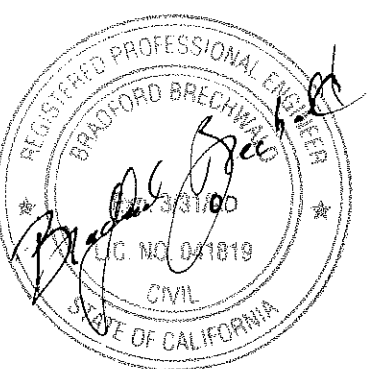
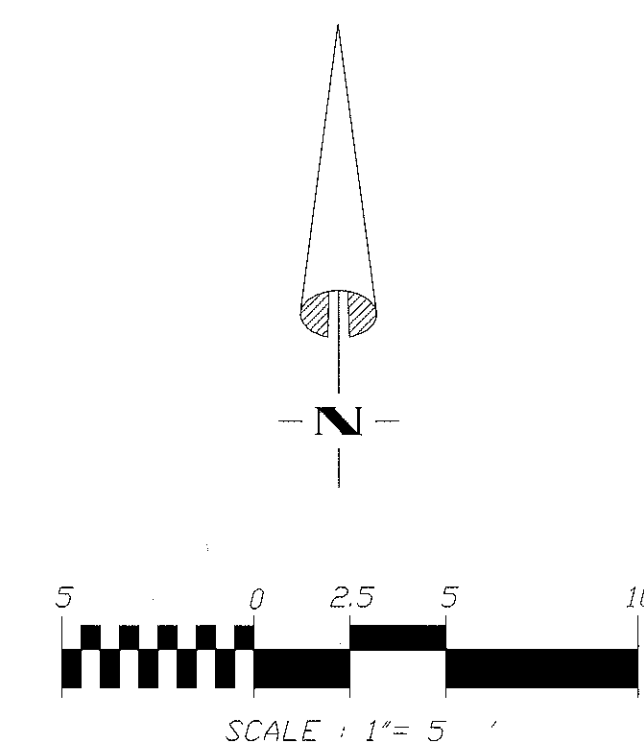


GENERAL NOTES

1. ALL WORK IN THE CREEK AND EXISTING CALTRAN'S CULVERT TO COMPLY WITH THE SPECIFICATIONS AND REQUIREMENTS OF ALL APPLICABLE PERMITS (CALTRANS, DFG, DFW, ARMY CORPS, WCB ETC...)
2. REMAINING PORTIONS OF THE CUESTA COLLEGE DIVERSION DAM MAY BE UNSTABLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSURING THE SAFETY OF WORKERS IN AND AROUND THE AREA OF THE DAM.

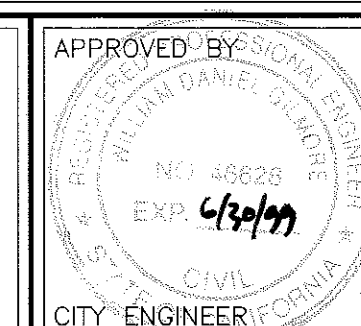
CONSTRUCTION NOTES:

1. CONSTRUCT CONCRETE WEIR PER PLAN AND PER DETAILS ON SHEET S-3.
2. EXCAVATE ROCK ACCORDING TO RECOMMENDATION OF SOILS ENGINEER.
3. REFER TO STRUCTURAL ENGINEER'S DETAILS ON SHEET S-3 FOR REINFORCEMENT AND CONNECTION DETAILS.



city of san luis obispo

Plan & Profile
Site One: Cuesta College Diversion Dam
Pennington Creek
Riparian Enhancement Project

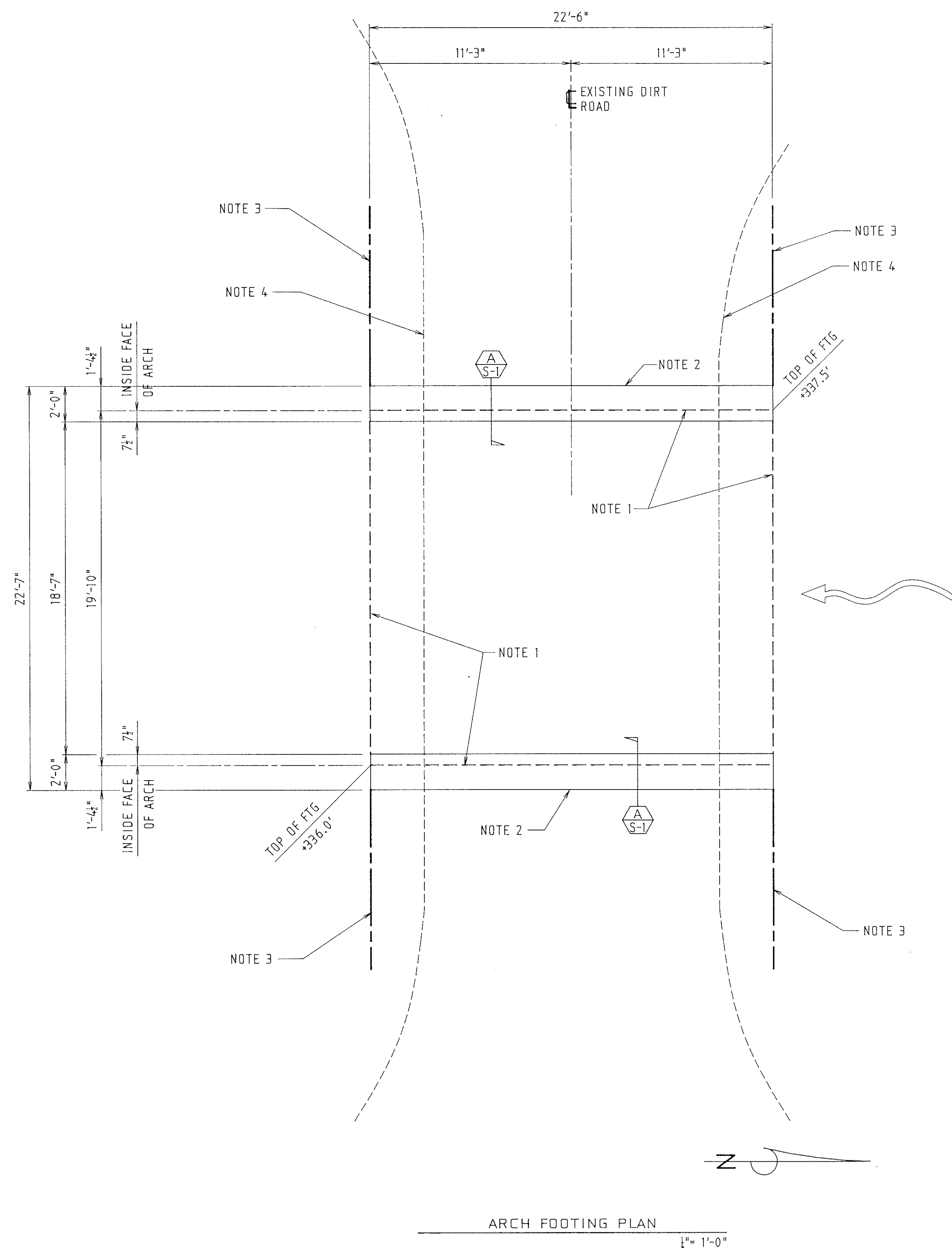


DATE 8-4-97
SCALE 1:10
DESIGNED BY GAR
DRAWN BY CD
CHECKED BY
APPROVED BY
CITY ENGINEER



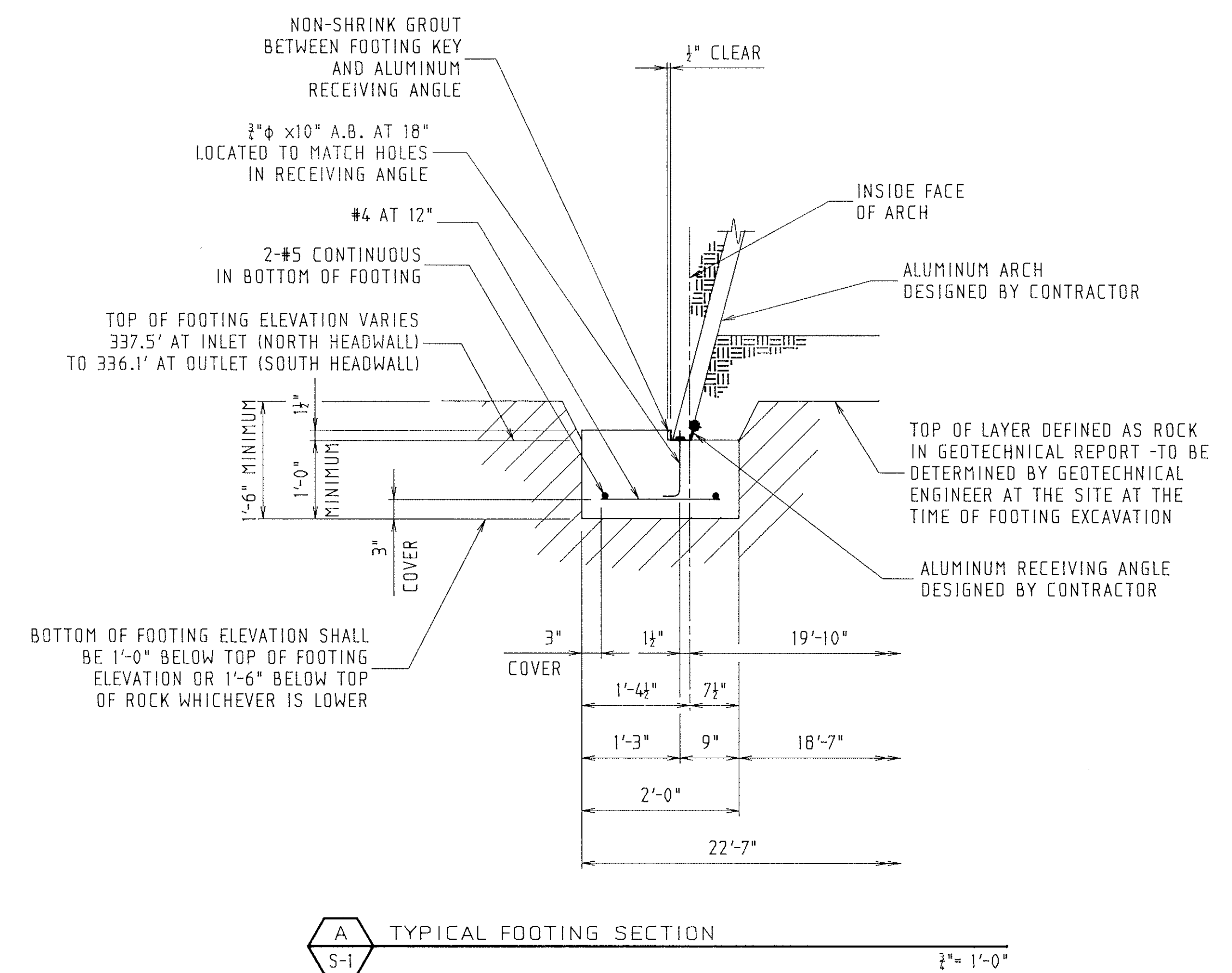
John L. Wallace & Associates
Civil Engineering - Surveying - Planning
4115 So. Broad St B5 San Luis Obispo, Ca
(805)544-4011 FAX 544-4294

SPECIFICATION NO.
95-28
FILE NO./LOCATION
CREEK3.DWG
SHEET
6 OF 10



REFERENCE NOTES

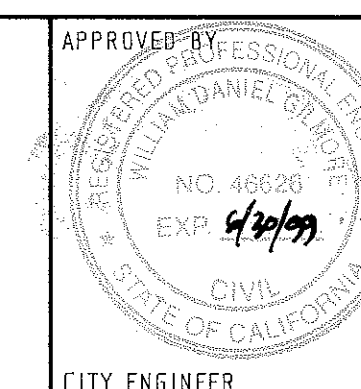
1. LINE OF ALUMINUM ARCH DESIGNED BY CONTRACTOR
2. LINE OF CAST-IN-PLACE CONCRETE FOOTING SHOWN HEREON
3. LINE OF ALUMINUM HEADWALL DESIGNED BY CONTRACTOR
4. LINE OF RAIL -SEE CIVIL ENGINEERING DRAWINGS



SEE SHEETS S-1.1 - S-2.1 FOR
REVISED STRUCTURAL.

RECORD DRAWING
DATE: December 1999 BY: JCB

ARCH FOOTING PLAN & DETAILS PENNINGTON CREEK WEIRS

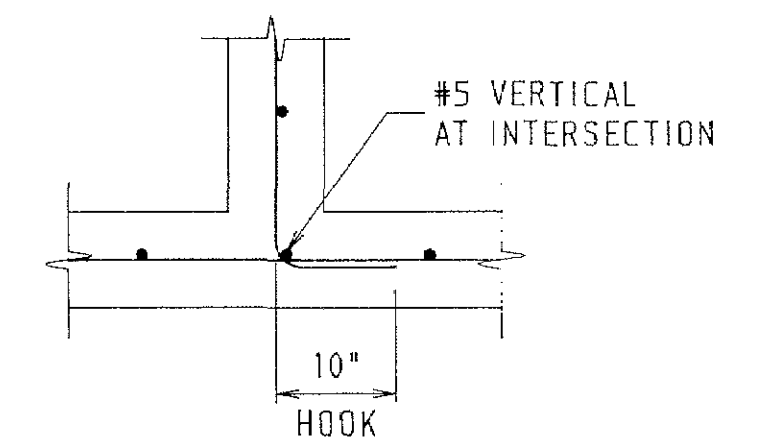
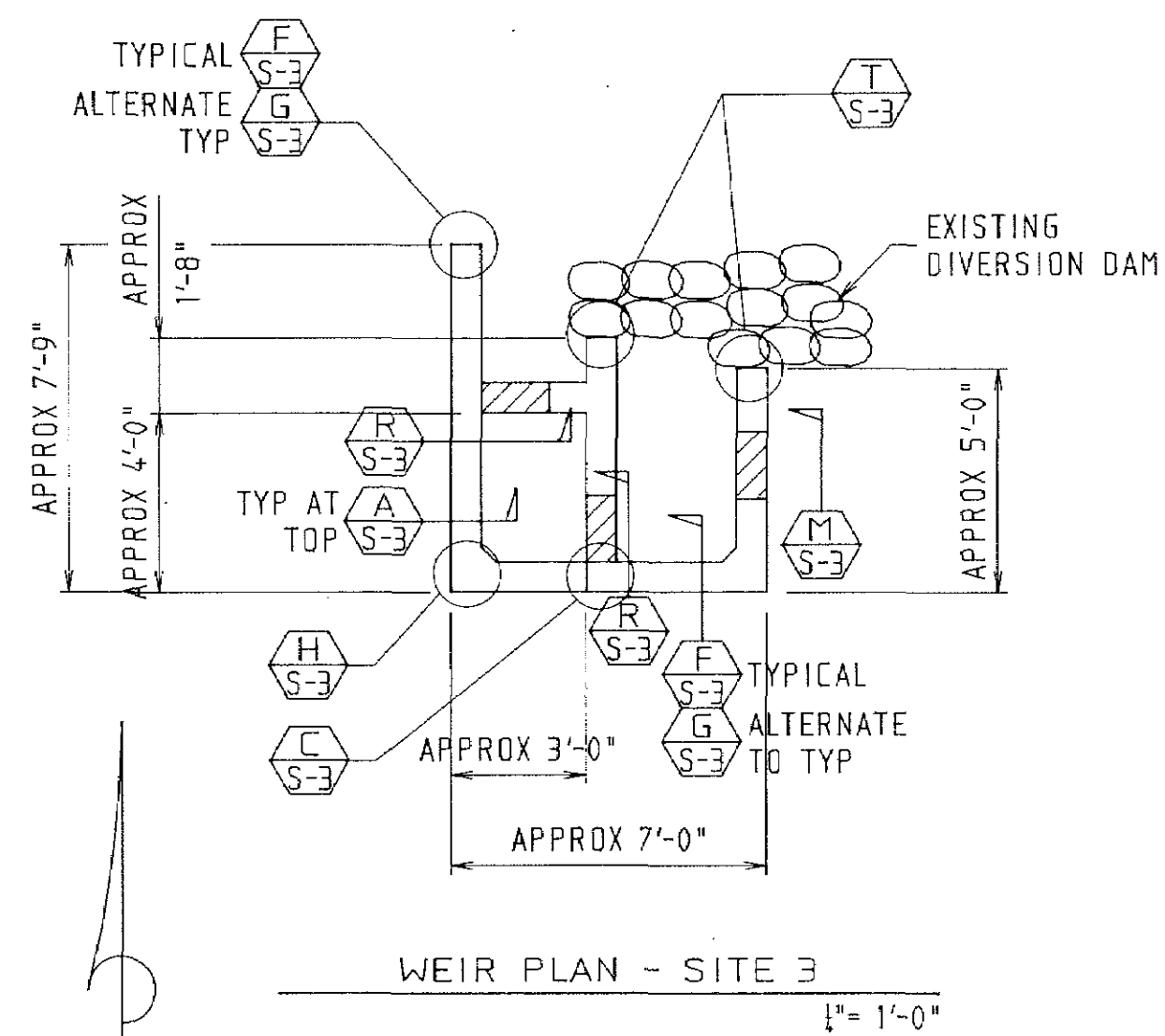



APPROVED BY: *W.D.G.*
SCALE: AS NOTED
DESIGNED BY: DMC
DRAWN BY: RKN
CHECKED BY: JCB
APPROVED BY: *W.D.G.*

APPLIED
ENGINEERING
P.O. Box 4445 708 Fiero Lane #12
San Luis Obispo, California 93403
805/544-5684

JOB: 297044
DATE: 07-AUG-97

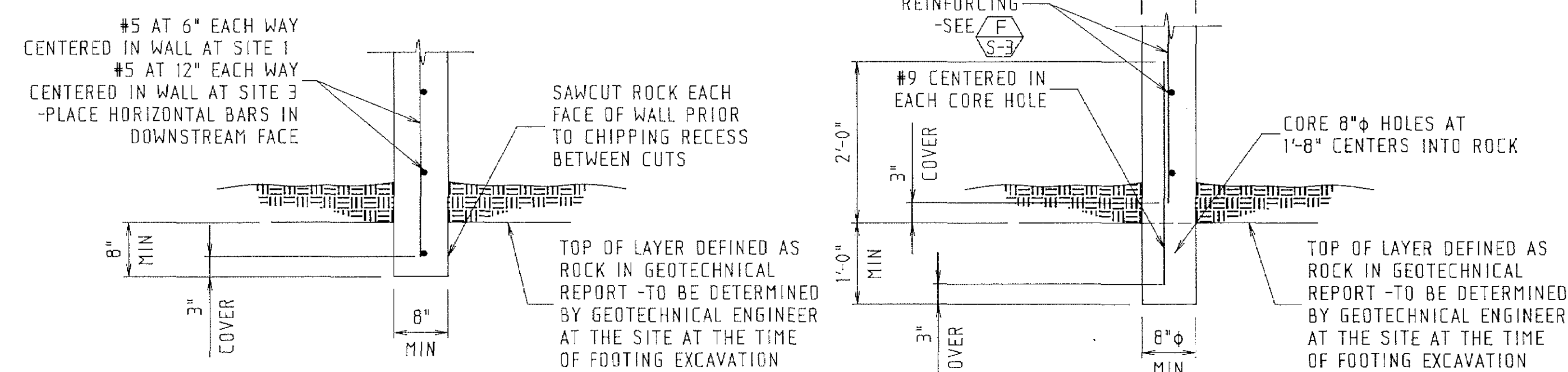
SPECIFICATION NO.
95-28
FILE NO./LOCATION
SHEET
S-1



 TOP OF WEIR WALL SECTION
AT SITE 3 ONLY

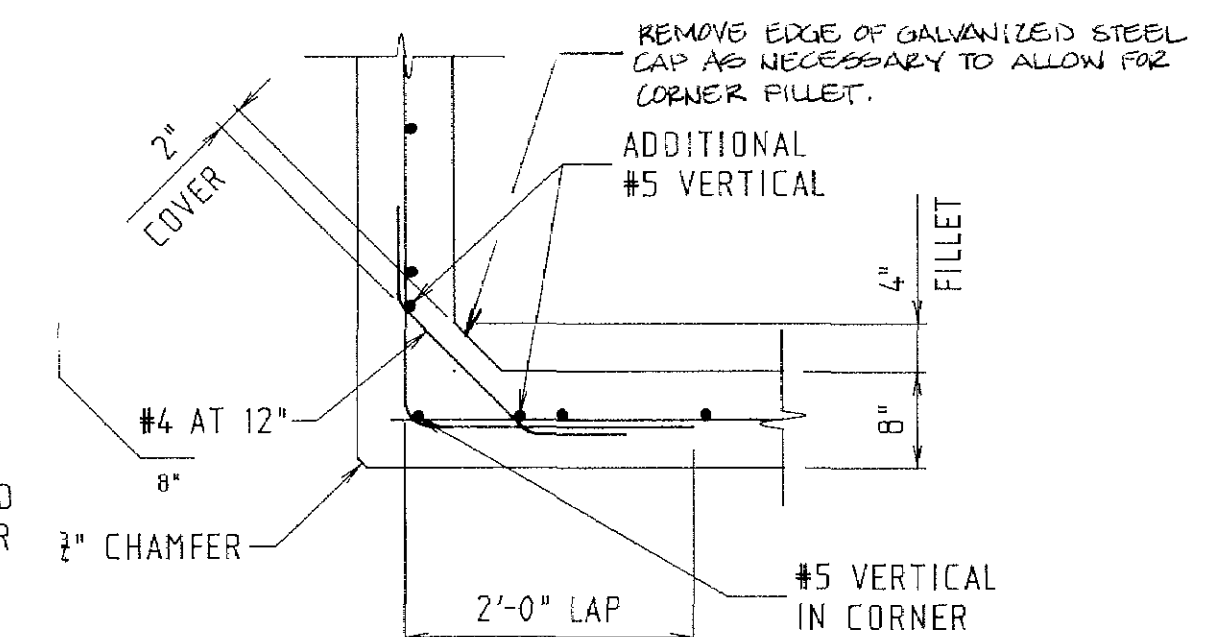

 TOP OF WEIR WALL SECTION
 AT SITE 1
 ±" = 1'-0"

 TYPICAL WALL INTERSECTION
PLAN SECTION 1" = 1'-0"



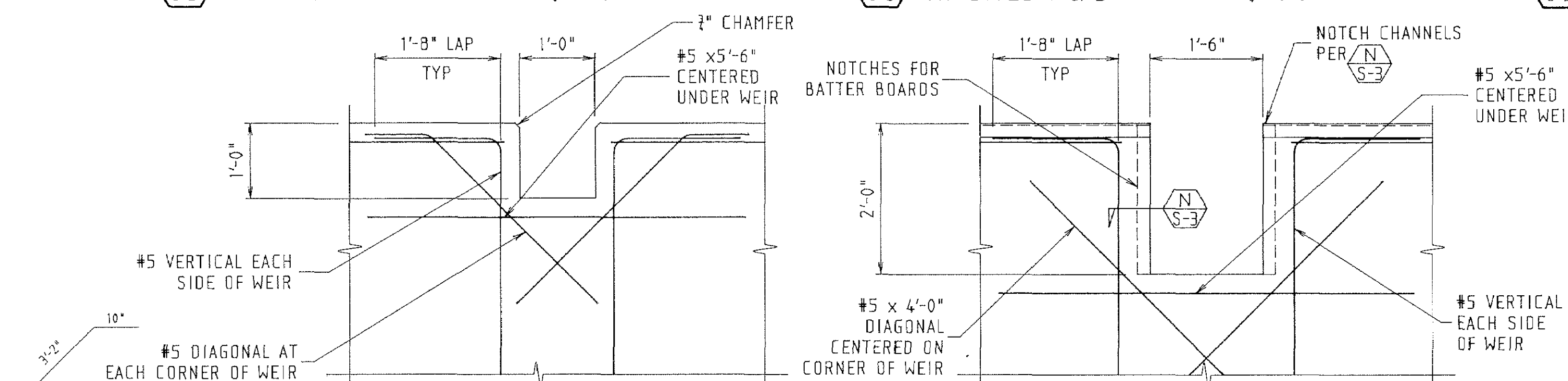
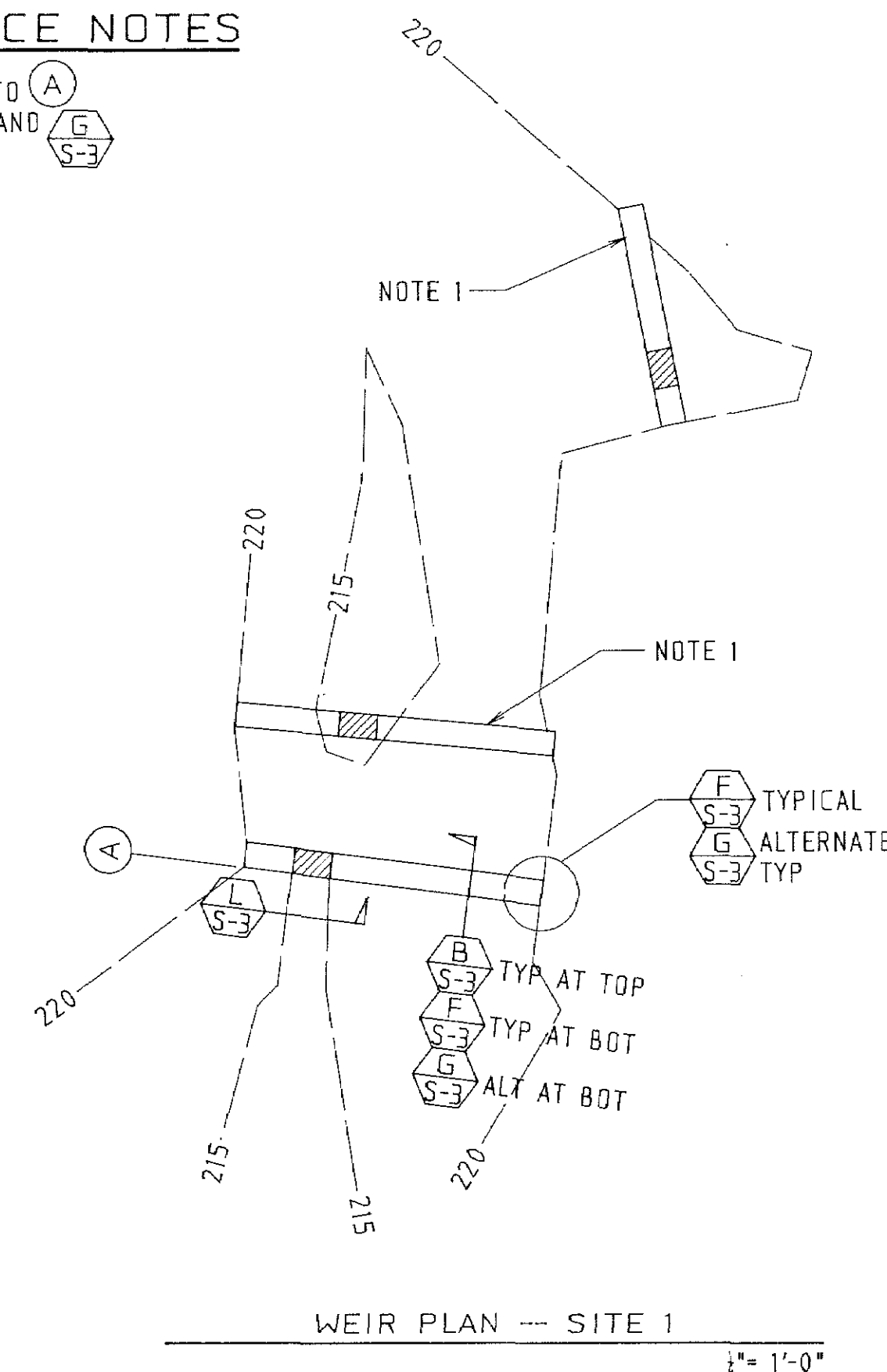
F WEIR SECTION AT
S-3 SITES 1 & 3 $\frac{1}{2}" = 1'-0"$

ALTERNATE WEIR SECTION
AT SITES 1 & 3 2" = 1'-0"



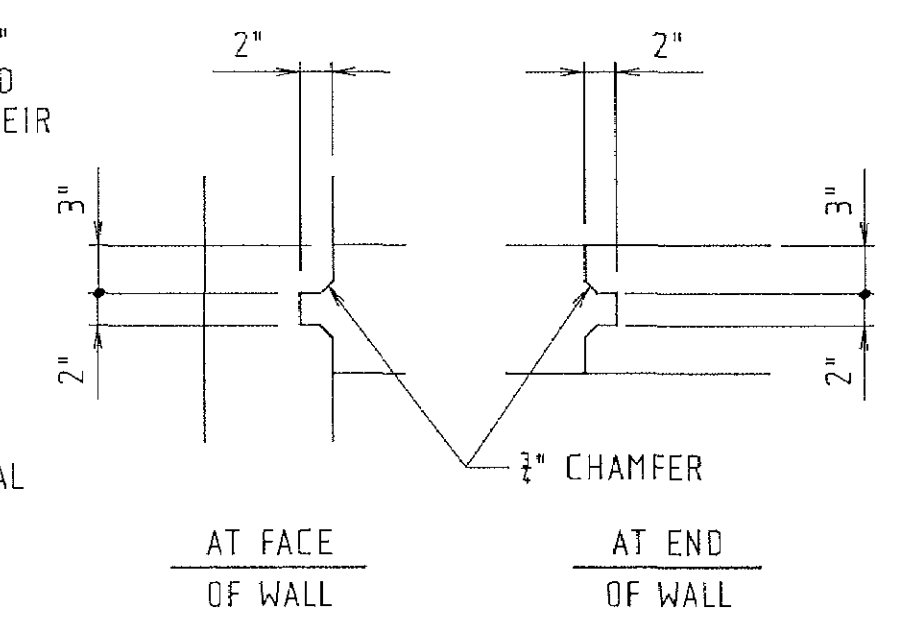
 TYPICAL CORNER PLAN SECTION
2" = 1'-0"

1. WEIR WALL SIM TO (A)
SEE (B), (F) AND (G)

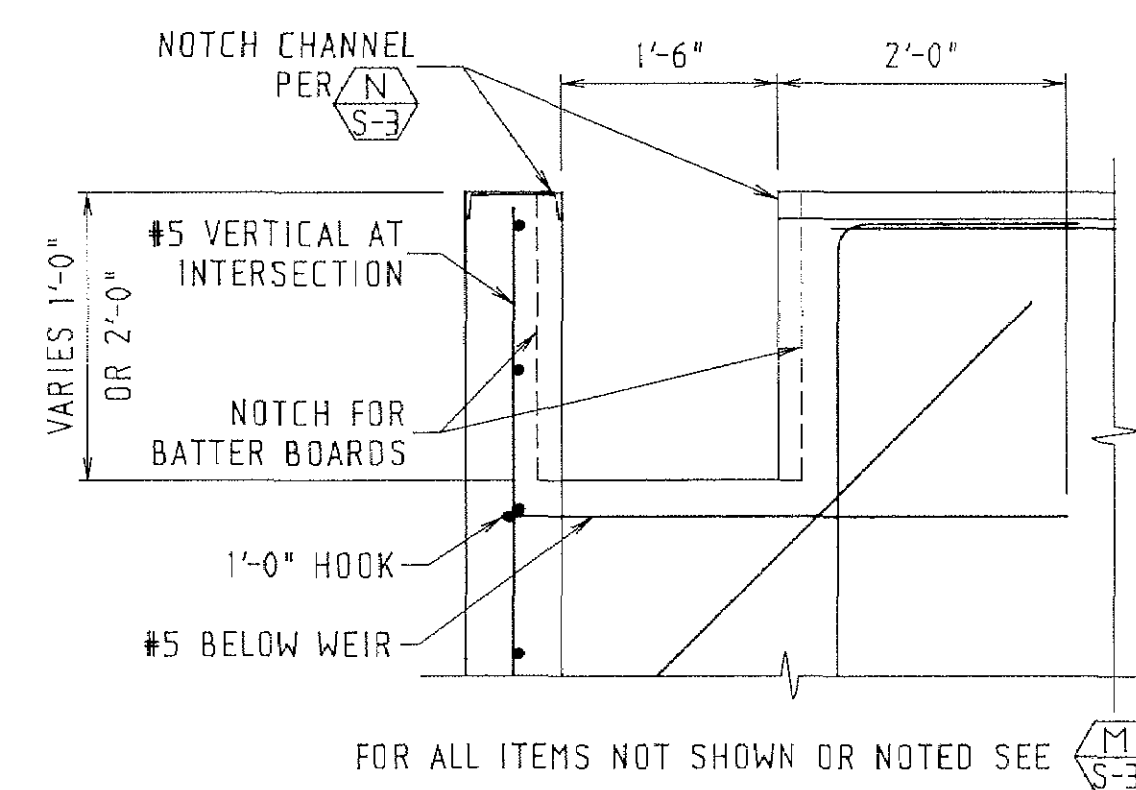



 TYPICAL WEIR ELEVATION
 AT SITE 1
 1'-0"

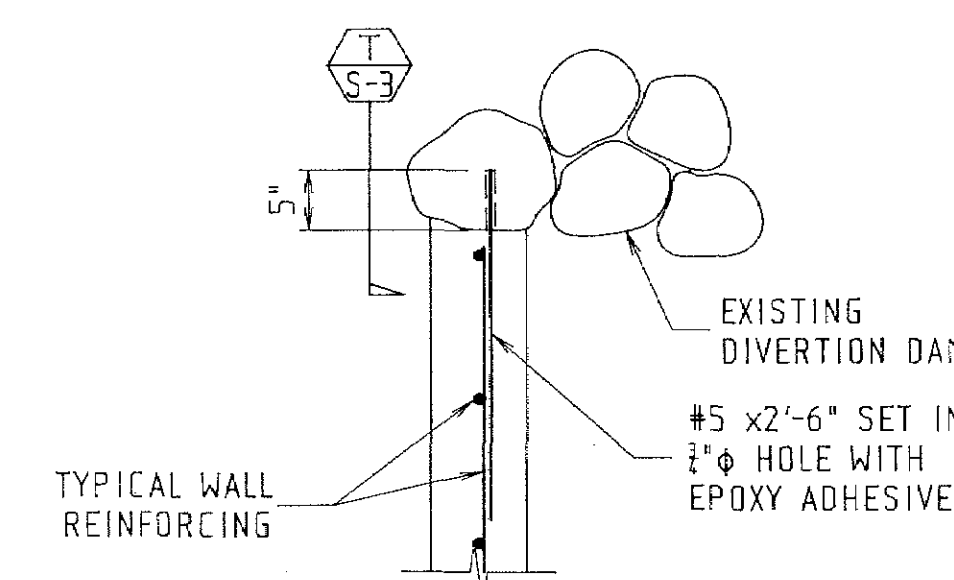

 TYPICAL WEIR ELEVATION
 AT SITE 3
 3" = 1'-0"



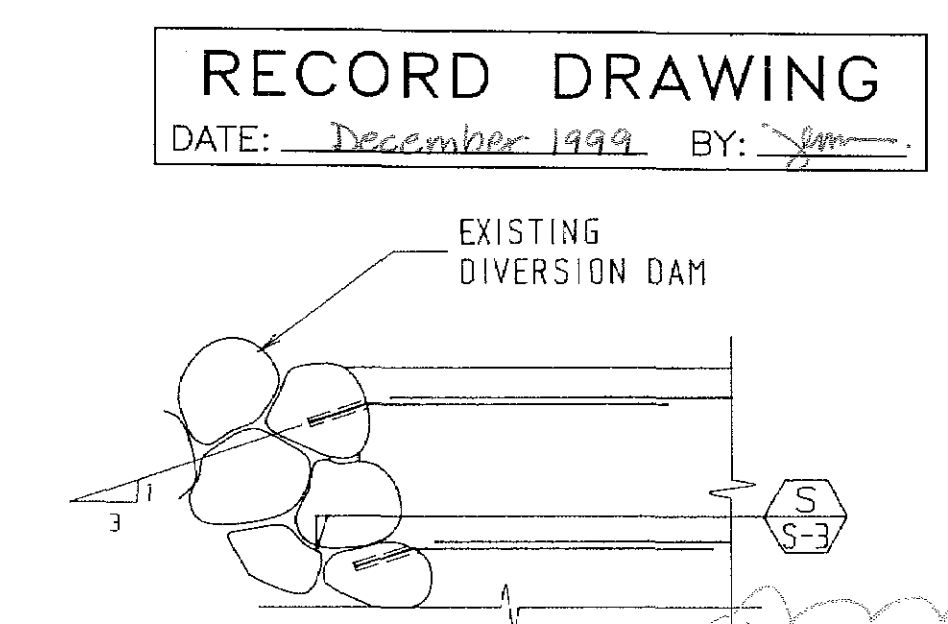
 BATTER BOARD NOTCH DETAIL
1" = 1'-0"



R	WEIR ELEVATION AT CORNER	
S-3	AT SITE 3	3" = 1'-0"



S WEIR CONNECTION TO DIVERSION DAM
S-3 PLAN SECTION $3'' = 1'-0''$



WEIR CONNECTION TO
DIVERSION DAM ELEVATION $\frac{3}{4}" = 1'-0"$

APPROVED BY

REGISTERED PROFESSIONAL ENGINEER
WILLIAM DANIEL GILMORE
NO. 49626
EXP. 4/30/99
CIVIL
STATE OF CALIFORNIA

CITY ENGINEER

SCALE:	AS NOTED
DESIGNED BY:	DMC
DRAWN BY:	RKN
CHECKED BY:	JCB
APPROVED BY:	<i>WDR</i>

**APPLIED
ENGINEERING**
P.O. Box 4445 708 Fiero Lane #12
San Luis Obispo, California 93403
805/544-5684

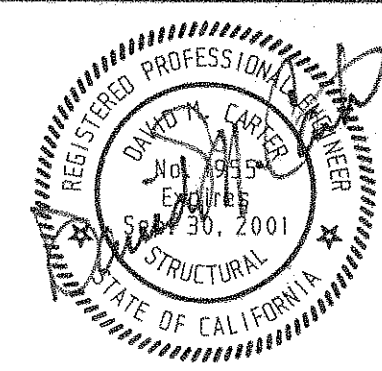

JOB: 297044
DATE: 07-AUG-97

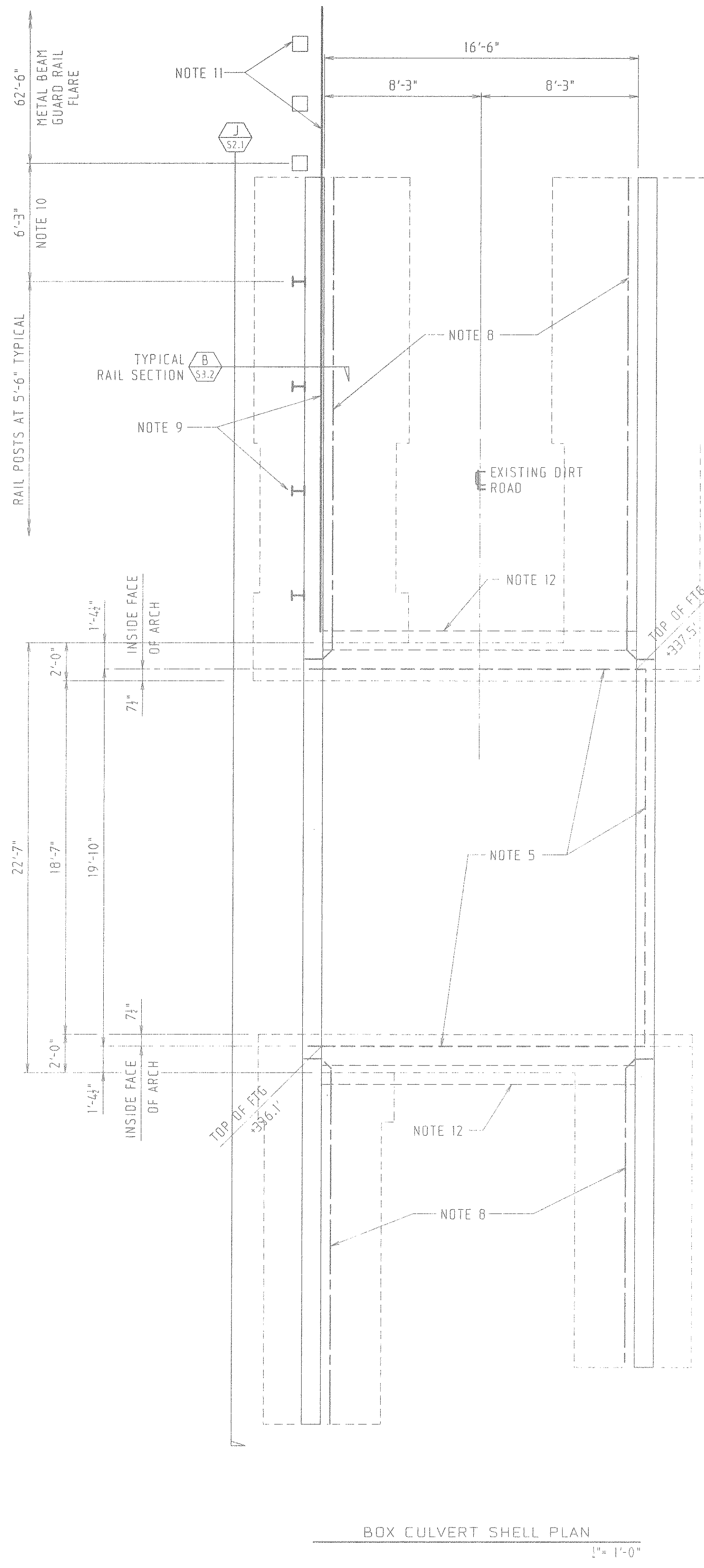
SPECIFICATION NO.
95-28

FILE NO./LOCATION

SHEET

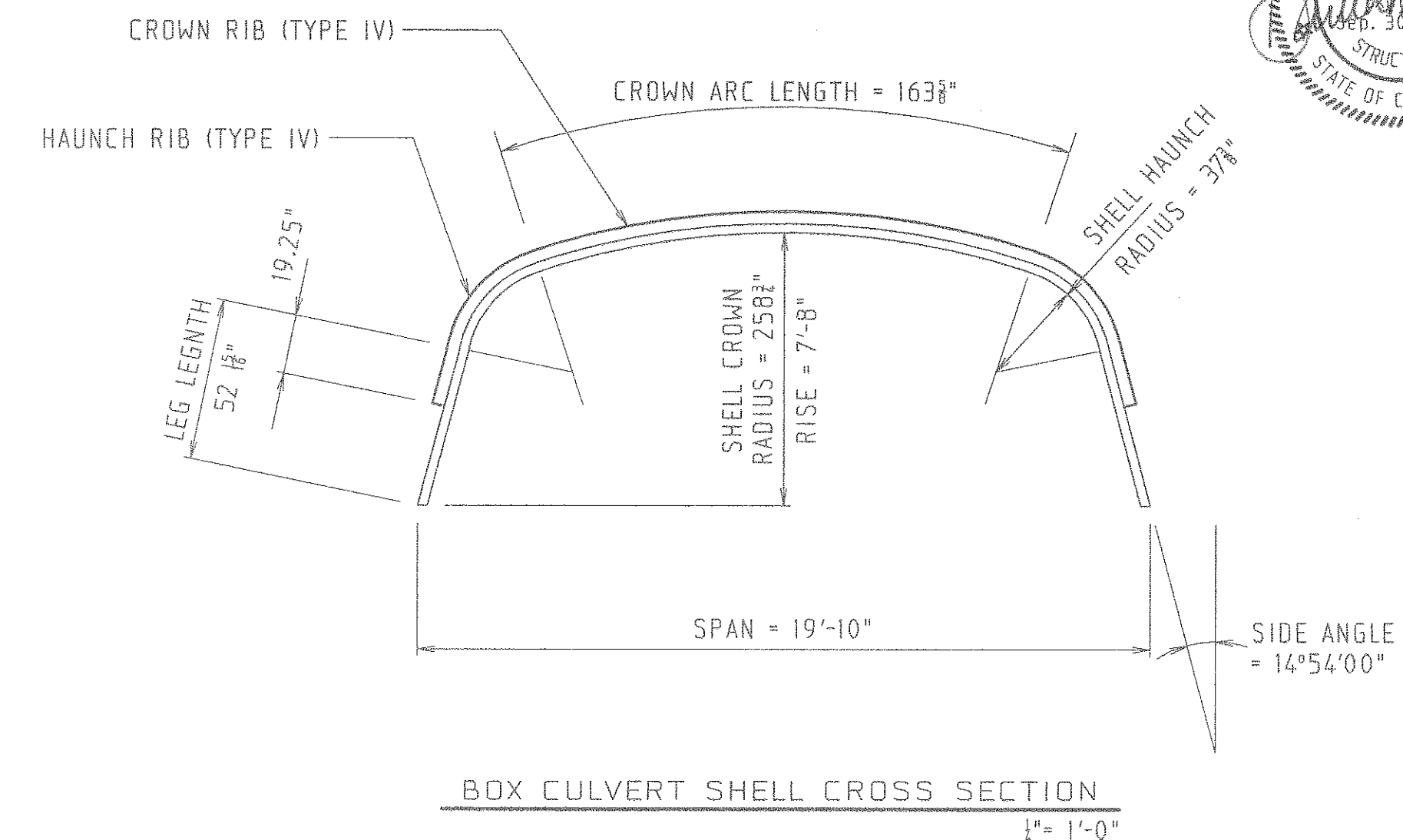
S-3

<p>1 -- GENERAL REQUIREMENTS</p> <p>1.01 Details shown on structural drawings are typical. Similar details apply to similar conditions. Dimensions take precedence over scale. Dimensions on Architectural drawings shall take precedence over dimensions on Structural drawings, and shall govern where no dimensions are shown on the Structural drawings. Notes on the drawings take precedence over General Notes. Conditions requiring construction different from that shown shall be reported to the Engineer. Whenever there is a conflict between requirements shown on the drawings, the more stringent requirement shall govern.</p> <p>1.02 These Structural drawings represent the finished structure, and unless otherwise indicated, they do not show the method of construction. Provide all measures necessary to protect the structure, workmen, and other persons during construction. Provide temporary bracing and shoring for structural elements of sufficient strength and stiffness to resist all imposed loads, including wind and seismic loads. Provide temporary barriers and lighting when necessary. Contractor is solely responsible for the above measures, and shall engage properly qualified persons to determine where and how temporary precautionary measures shall be used, and inspect same in the field. Observation visits to the site by the Engineer shall not include observation of these measures.</p> <p>1.03 Building Codes: Construction shall conform to the applicable sections of the latest edition of the following building codes, these Structural Notes, and to local ordinances. Whenever there is a conflict between codes, the more stringent requirements shall govern.</p> <p>A. Uniform Building Code (UBC).</p> <p>B. American Concrete Institute, Building Code Requirements for Reinforced Concrete (ACI 318)</p> <p>C. Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice.</p> <p>D. American Welding Society, Structural Welding Code--Reinforcing Steel, AWS D1.4.</p> <p>E. American Institute of Steel Construction (AISC) Manual of Steel Construction.</p> <p>F. American Welding Society, Structural Welding Code--Steel, AWS D1.1.</p> <p>G. State of California, Department of Transportation, Standard Specifications.</p> <p>H. AASHTO Standard Specifications for Highway Bridges and its Interim Specifications.</p> <p>1.04 Observation:</p> <p>A. The Contractor shall inform the Engineer 24 hours in advance of the following construction stages.</p> <ol style="list-style-type: none"> Reinforcing steel in place. Concrete placing operations. Aluminum culvert in place, but not covered. Steel framing completed, but not covered. <p>B. Special Inspection: The Owner shall retain and pay for the services of a Special Inspector, acceptable to the Engineer, for the following inspection of the following construction. Inspectors shall submit signed reports to the Structural Engineer and Building Official within 2 weeks after each inspection. Names of inspectors and sample report forms shall be submitted to the Engineer and Building Official. Reports shall include notation of elements inspected and deviations from the drawings. Contractor shall advise the Owner at least two weeks prior to the need for a Special Inspector.</p> <ol style="list-style-type: none"> Periodic inspection of concrete reinforcing placement and continuous inspection of concrete placement for all concrete elements. Prior to placing concrete, Inspector shall observe size, grade, location and spacing of reinforcing steel. All deviations from the drawings shall be resolved prior to placing concrete. Inspector shall continuously observe concrete placement by verifying proper mix design, placing equipment, and placing procedure including vibration. Inspector shall either observe or perform preparation of concrete test samples. Periodic inspection of aluminum culvert field erection and installation. Verify size, gage, and grade of elements and connectors. Observe installation of elements by verifying location of elements in the structure, number and location of connectors, and compliance with manufacturer's installation recommendations. At the beginning of erection operations, inspector shall continuously inspect installation until satisfied that work is being performed in accordance with the drawings, specifications, and manufacturer's recommendations. Inspector may then suspend continuous inspection and inspect periodically contingent upon continued satisfactory installation. Inspector shall also inspect completed construction for elements which received only periodic inspection. Continuous inspection of all field welding and any shop welding performed by a fabricator not previously approved by the Building Department. Inspector shall verify proper size, grade, fabrication and fit of steel elements, proper welder's qualifications, and proper welding materials and procedures. Single pass fillet welds done in a shop may be periodically inspected as follows. At the beginning of shop fabrication, inspector shall continuously inspect welding until satisfied that work is being performed in accordance with the drawings and specifications. Welding inspector may then suspend continuous inspection. Welding inspector shall also visually inspect completed welds for which periodic inspection is performed. 	<p>4. Periodic inspection of installation of adhesive anchors and dowels. At the beginning of drilling or coring operations, inspector shall continuously inspect operations until satisfied that work is being performed in accordance with the drawings and specifications. Inspector may then suspend continuous inspection. Prior to installing anchors, Inspector shall visually inspect hole diameter, depth, spacing, cleanliness, and surface moisture. Observe mixing of adhesive for compliance with manufacturer's recommendations and proper consistency. Observe installation of anchors for compliance with these specifications and manufacturer's recommendations. Mark the depth of embedment on the anchors to establish that the anchors are in the full depth of embedment. Inspector shall continuously inspect installation and testing of anchors.</p> <p>1.05 Live Load: Standard HS-20 Truck Loading.</p> <p>1.06 Substitutions:</p> <p>A. Whenever any structural product is specified by proprietary name, that specification shall be assumed to be followed by the words "or equivalent". This shall mean equivalent in every way in the opinion of the Engineer.</p> <p>B. Submittals: The Contractor shall submit to the Owner all documentation and/or samples required by the Engineer to determine equivalence. All such submittals shall be made at least 2 weeks prior to the incorporation of any such substitution into the project. In no case shall any substitution be made without the written authorization of the Engineer. All submittals shall include all other substitutions or changes required in adjacent construction and/or by other trades to accomplish the substitution.</p> <p>1.07 Revisions: Revisions shall be made only upon direction of the Engineer. The Building Official, Building Inspector, and Special Inspectors are not empowered to make any revisions to the drawings or specifications. Any revision made by the Contractor at the direction of anyone other than the Engineer is undertaken completely at the Contractor's risk.</p> <p>1.08 Existing Conditions:</p> <p>A. The Contractor is presumed to have visited the site and familiarized himself with existing conditions prior to submitting a bid.</p> <p>B. Existing grades indicated on the drawings are approximate only.</p> <p>C. Adjacent structures:</p> <ol style="list-style-type: none"> Protection: Contractor shall take all measures necessary to protect existing structures from damage during construction. If such damage does occur, restore existing structures to essentially original condition as directed by the Engineer. Clearance: Do not place any structure shown on these drawings directly against any other existing or proposed structure unless specifically shown otherwise on these drawings. Provide minimum 1/2" clearance between the structure shown on these drawings and any such existing or proposed structures. For example, retaining walls and fences shall be held a minimum of 1/2" clear of any this structure. <p>1.09 Definitions: The following words used on the drawings and/or in the specifications are defined as follows.</p> <p>A. Engineer: References to the Engineer shall mean the firm Applied Engineering, or any employee or consultant designated to act on behalf of the Engineer. All written or telephonic communication by the Contractor with the Engineer shall occur through the Contractor, or directly with the Engineer only when so directed by the Contractor.</p> <p>B. Civil Engineer: The firm of John L. Wallace and Associates.</p> <p>C. Geotechnical Engineer: The firm of Earth Systems Consultants Northern California.</p> <p>D. Contractor: References to the Contractor shall mean the General Contractor, Maino Construction Company, Inc.</p> <p>E. Drawings: References to the drawings shall mean the structural drawings prepared by Applied Engineering. Structural drawings show only structural elements. Non-structural elements are shown schematically to indicate their relationship to the structure, and are noted as being designed by others.</p> <p>F. Specifications: References to the specifications shall mean these General Structural Notes.</p> <p>G. Shop Drawings: Where indicated, shop drawings shall be submitted to the Engineer. Prior to submittal, shop drawings shall be reviewed and approved by the Contractor. Contractor's review shall verify dimensions and quantities, approve means, methods and procedures of construction and installation, and guarantee job site safety. Shop drawings may be reviewed by the Engineer. Such review by the Engineer, if any, will only be for general conformance with the design, and will not be to determine accuracy or completeness of other details such as dimensions and quantities, and will not be to approve means, methods and procedures of construction and installation, nor to review job site safety. Any fabrication of elements shown on shop drawings which is performed prior to two weeks after submittal of shop drawings is undertaken completely at the Contractor's risk.</p> <p>H. Inspection: Inspection or inspect shall mean observation of the work to verify substantial compliance with the drawings and specifications to the best knowledge of the inspector. Inspection does not mean absolute compliance with the drawings, specifications or any code.</p>	<p>2 -- EARTHWORK</p> <p>2.01 Foundation Design:</p> <p>A. Reports: Copies of the following reports are available for inspection at the office of the Engineer.</p> <ol style="list-style-type: none"> Foundation Report, Steelhead Passage Restoration, Pennington Creek, San Luis Obispo County, California dated June 12, 1997 prepared by Earth Systems Consultants Northern California. Pennington Creek Bridge, Pennington Creek Road at Rancho El Chorro, San Luis Obispo County, California dated July 10, 1997 prepared by Earth Systems Consultants Northern California. Pennington Creek Riparian Enhancement Project, Rancho El Chorro Culverts, San Luis Obispo County, California dated August 27, 1998 prepared by Earth Systems Consultants Northern California. <p>B. Allowable soil bearing pressure: 5000 psf for dead load plus live load with minimum footing depth of 1'-6" in rock.</p> <p>C. Lateral Earth Pressures:</p> <ol style="list-style-type: none"> Active Pressure: 35 pcf. Passive Pressure: 500 pcf in rock. Friction Coefficient: 0.45 in rock. <p>D. Review of Drawings: Foundation plan, details and specifications have been submitted to the Geotechnical Engineer. Geotechnical Engineer shall submit to the Engineer a letter confirming that these documents have been reviewed and found acceptable as required in the reports. Do not commence foundation construction until this letter has been submitted and accepted by the Engineer.</p> <p>E. Observation: The Owner shall retain and pay for the Geotechnical Engineer, or another qualified Geotechnical Engineer acceptable to the Engineer, to take all field samples and do all laboratory testing necessary to ensure compliance of the work to these structural notes. The Geotechnical Engineer shall submit results of all testing done during the course of the work to the Owner and Engineer, and shall at the completion of the work certify in writing that the work performed by the Contractor under this section complies with the requirements herein. In particular, the Geotechnical Engineer shall perform the following specific tasks.</p> <ol style="list-style-type: none"> The Geotechnical Engineer shall observe the headwall and culvert footing excavations and establish that the footings will be founded in rock as described in the reports. The Geotechnical Engineer shall observe the culvert backfill operations to assure proper backfill procedures as specified herein and shown in the culvert manufacturer's recommendations. <p>2.02 Unexpected Site Conditions:</p> <p>A. Soils: Allowable values and foundation design are based upon assumed uniform, competent soil conditions shown by test boring logs. Actual soil conditions which deviate appreciably from that shown in the test boring logs, or will require construction appreciably different from that shown on the drawings shall be reported to the Engineer.</p> <p>B. Buried Structures: Contractor shall investigate site during clearing and earthwork operations for buried structures. Any such structures encountered shall be reported to the Engineer.</p> <p>2.03 Compaction Requirements:</p> <p>A. Reference test: Field tests performed in accordance with ASTM D1556 or ASTM D2922 and D3017 with reference to the maximum dry density determined by ASTM D1557.</p> <p>B. Compaction requirements: All fill and backfill materials shall be compacted to 90% relative compaction. Jetting of soils to obtain compaction is prohibited. All pumping soils shall be removed and replaced as directed by the Engineer, regardless of compaction test results.</p> <p>2.04 Clearing and stripping: All trees, shrubs, stumps, rubbish, weeds, grass, and all soil containing organic or other deleterious matter, shall be stripped and removed from the structure site. The uppermost 6" of soil is considered a minimum.</p> <p>2.05 Grading:</p> <p>A. Cut: Excavate to depth and extent shown on drawings and as specified herein. Cut slopes shall not exceed 2:1.</p> <p>B. Structure Excavation: Excavate for foundations at locations, and to lines and dimensions shown on the drawings. Cast footings neat in excavations in rock. Do not form footings. Fill any overexcavation with structural concrete. Drain all surface and ground water from excavations. Any foundation which will slope more than 1:15 shall be stepped. Remove debris and loose material from all excavations. All footing excavations shall be accepted by the Geotechnical Engineer prior to placing concrete.</p> <p>2.06 Fill and Backfill:</p> <p>A. Materials:</p> <ol style="list-style-type: none"> General: All fill and backfill materials are subject to acceptance by the Geotechnical Engineer. Headwalls shall not be backfilled until concrete has reached design strength, or at least 14 days after concrete has been placed, whichever is sooner. Site Materials: Existing site materials except those removed during clearing and stripping operation are acceptable for filling and backfilling except where import material is specifically designated. Site material shall be cleaned of all organic matter and irreducible material over 2" in diameter. 	<p>6. Import materials:</p> <p>a. Typical: Granular, non-expansive, free of organic matter, deleterious substances and irreducible material over 2" in diameter, and having an expansion index less than 20.</p> <p>b. At aluminum culvert: Comply with requirements for typical import materials and in addition, comply with the following. Clean, well graded granular material complying with AASHTO M145 for soil classifications A-1, A-3, A-2-4 or A-2-5.</p> <p>7. Permeable Backfill: Floatrock, 3/4 x #4 gravel, or Class 2 permeable material complying with requirements of section 68-1.025 of the Caltrans Standard Specifications.</p> <p>8. Filter fabric: Permeable, non-woven, polyester, nylon, or polypropylene geotextile weighing a minimum of 4 oz. per square yard.</p> <p>9. Perforated Drain Pipe: ASTM D2729. Slope 0.25% to drain to daylight at lowest point of lower grade. Extend drain through wall in sheet metal or PVC sleeve to provide between 1/4" and 1/2" clear to drain pipe.</p> <p>B. Preparation: Scarify areas to be filled to a depth of 1'-0". Adjust moisture content of scarified surface to within 3% of optimum moisture content and compact.</p> <p>C. Fill: Fill to depth and extent shown on drawings and as specified herein.</p> <p>D. Placement: Place and compact fill material in lifts not exceeding 8". Fill material shall be within 3% of optimum moisture. Fill slopes shall not exceed 2:1.</p> <p>E. Aluminum culvert backfill: The aluminum culvert cannot safely support construction vehicles which exceed highway load limits, and prior to the completion of construction the aluminum culvert may not support construction vehicles which comply with highway load limits. Only small tracked vehicles (D-4 or smaller) shall be used in the vicinity of the aluminum culvert. Refer to ASTM B789 installation specification. The aluminum culvert must be protected from unbalanced loads during construction.</p> <p>F. Sub-surface drainage behind headwalls shall extend from 1'-0" below the surface of upper grade to lower grade level. It shall consist of one of the following assemblies.</p> <ol style="list-style-type: none"> Prefabricated drainage material: Plastic spacing material and filter fabric of one of the following manufacturers. Fabric shall be wrapped around perforated drain shown on the drawings. <ol style="list-style-type: none"> J-Drain 100 a product of JDR Enterprises. Amerdrain 480 a product of American Wick Drain Corporation Eljen PDS a product of Eljen Development Corporation Enkadrain Type 9010 a product of Akzo Industrial Systems Company. Permeable backfill material enclosed in filter fabric: Perforated drain shall be installed 6" behind wall in the permeable material. <p>3 -- CONCRETE</p> <p>3.01 General: All concrete work shall be done in accordance with the latest editions of the ACI Building Code (ACI 318) and the ACI Manual of Concrete Practice.</p> <p>3.02 Reinforcing Materials:</p> <p>A. #3 bars and smaller: ASTM A615 Grade 40 or Grade 60.</p> <p>B. #4 bars and larger: ASTM A615 Grade 60.</p> <p>3.03 Concrete Materials:</p> <p>A. Cement: Portland, type II, ASTM C150.</p> <p>B. Fine aggregate: ASTM C33.</p> <p>C. Coarse aggregate: ASTM C33, 3/4" or 1".</p> <p>D. Water: Potable, clean, and pure. This requirement applies to water used in mix as well as to water for aggregate washing and for curing.</p> <p>E. Ready-mixed concrete: ASTM C94.</p> <p>F. Water reducing admixture: Polyheed 997 or Polyheed IR at the rate of 6 oz per cwt., Pozzolith 300R, 300N, or 322N at the rate of 5 oz. per cwt., Zeecon at the rate of 6.8 oz. per cwt., Zeecon H at the rate of 6 oz. per cwt., or Grace WDA-79 at the rate of 8 oz. per cwt.</p> <p>G. Fly Ash: Fly ash complying with ASTM C618, class shall be used to replace cement between 15% and 10% by weight.</p> <p>3.04 Concrete Strength: 3000 psi @ 28 days.</p> <p>3.05 Concrete Consistency: Maximum slump = 4 1/2" per ASTM C143.</p> <p>3.06 Concrete Proportioning:</p> <p>A. Mix Design: Submit for review by the Engineer. Mix design shall be specific to this project.</p> <p>B. Maximum water-cement ratio: 6.0 gal. per sack.</p> <p>C. Minimum Cement Content: 6.0 sacks per yard.</p> <p>3.07 Miscellaneous materials:</p> <p>A. Expansion joint filler: 1/2" thick unless otherwise shown. Comply with Specifications for Preformed Expansion Joint Fillers for Concrete (Non-extruding and resilient, Non-bituminous Types), ASTM D1752.</p> <p>B. Non-shrink grout: SikaGrout 212 or acceptable equivalent.</p>	<p>C. Anchor bolts: Galvanized, ASTM A307. Bolts shall have cut threads. Bolts with rolled threads are not permitted. Unless otherwise noted, minimum embedment shall be as shown in UBC Table 19-F, but not less than 4" minimum. One side of nuts used to connect aluminum plates to concrete shall be uniformly rounded. The rounded side of the nut shall be against the plate.</p> <p>D. Adhesive anchors: Hilti HIT HY-150 System in accordance with ICBO Evaluation Report 5193 or acceptable equivalent shall be used to connect steel to concrete where indicated on the drawings, and with the written permission of the Engineer, may be used where anchor bolts are indicated on the drawings.</p> <p>E. Cement grout, mortar and drypack: Proportions by volume shall be 2 parts sand, 1 part cement and a minimum of water consistent with placing requirements.</p> <p>F. Curing compound: At unfurmed concrete surfaces including formed surfaces where forms are removed prior to the end of the curing period. Clear liquid membrane all resin, water based curing compound conforming to ASTM C309, Type I, Class B, W.P. Meadows Sealtight 1100 or acceptable equivalent.</p> <p>3.08 Welding of reinforcing steel: Reinforcing steel shall not be heated or welded unless specifically detailed on the drawings or directed by the Engineer.</p> <p>3.09 Lap splices: 4B bar diameters or 1'-6" whichever is greater. Reinforcing bars shall not be offset at splices unless explicitly shown on drawings.</p> <p>3.10 Concrete curing: Keep unfurmed concrete continuously wet for 7 days, or apply curing compound.</p> <p>3.11 Form removal: Remove wall forms a minimum of 7 days after placing concrete. Wall forms may be removed after 4 days if curing is performed as specified for unfurmed surfaces.</p> <p>3.12 Vibration: Vibrate all concrete in place with a mechanical vibrator used by experienced personnel.</p> <p>3.13 Testing:</p> <p>A. Laboratory: The Owner shall retain and pay for the services of a Testing Laboratory acceptable to the Engineer, where samples will be tested in accordance with these structural notes and applicable standards of ASTM. Work under this section to be performed by the Contractor includes the following:</p> <ol style="list-style-type: none"> Provide a minimum of 24 hours notice to the Engineer and Testing Laboratory prior to concrete placing operations. Provide access for Testing Laboratory personnel and equipment, and coordinate and schedule concrete pours to allow for testing. Provide field storage facilities as directed for compression cylinders. <p>B. Samples: For every day's pour, or each 150 yards of concrete, or more often as directed, make three test cylinders.</p> <p>C. Testing of samples: Test one cylinder at 7 days and two at 28 days.</p> <p>D. Test reports: A copy of all test reports shall be submitted to the Structural Engineer.</p> <p>4 -- ALUMINUM CULVERT</p> <p>4.01 Materials:</p> <p>A. Culvert:</p> <ol style="list-style-type: none"> General: Aluminum Box Culvert as manufactured by Contech Construction Products or acceptable equivalent of size and configuration shown on the drawings. Plates, ribs, receiving channel and appurtenant items as shown on the drawings conforming to the requirements of ASTM B864 and AASHTO M219. Plate thicknesses, rib spacings shall be as indicated on the drawings. Plate corrugation shall be 2 1/2" deep and 9" pitch. Crown rib length shall be at least equal to the crown arc length. Plates, ribs, and receiving channel shall be corrugated, curved, and bolt hole punched in a shop. Field fabrication of the aluminum components is not permitted. <p>B. Bolts:</p> <ol style="list-style-type: none"> Bolts: 3/4" diameter, ASTM A307 or ASTM A449 hot-dipped galvanized in accordance with ASTM A193, Class C. The underside of the heads and one side of nuts shall be uniformly rounded. The rounded side of the nut shall be against the plate. Bolt Pattern: <ol style="list-style-type: none"> Plate End Laps: Install pairs of bolts at each plate high and low rib. Minimum end distance = 1 1/2". Minimum bolt spacing = 1 3/4". Hole diameter is typically 7/8" except slotted holes 7/8" x 1 1/8" are permitted at plate corners. Plate Side Laps: Install bolts at 9 5/8" at high ribs in slotted holes 7/8" x 1 1/8". Minimum edge distance = 1 1/2". Ribs: Install bolts at 9 5/8" to plates at high ribs. Splice crown rib to haunch rib with section of rib with two bolts each side of splice. <p>C. Backfill Materials: See section 2 EARTHWORK.</p> <p>4.02 Shop (Assembly) Drawings: Submit shop (assembly) drawings showing aluminum culvert in full detail.</p>	<p>4.03 Installation:</p> <p>A. General: Assemble and install aluminum box culvert in accordance with the drawings, shop drawings, manufacturer's recommendations, and AASHTO section 26, division II. For assembly information, see manufacturer's detailed assembly drawings and instructions shipped with the aluminum culvert.</p> <p>B. Bolt Torque: Plate lap must be properly mated in a tangent fashion using proper alignment techniques and adequate bolt torque to seat the corrugation. Torque bolts to 150 foot pounds minimum. When seam sealant tape is used, bolts shall be installed and retightened to this torque levels after 24 hours. Torque level is for installation, not residual, in-service requirements.</p> <p>C. Bolts at receiving angles: Leave nuts at anchor bolts at receiving angle loose until aluminum culvert is completely assembled. Then tighten nuts at anchor bolts prior to casting headwalls or backfilling.</p> <p>D. Backfill: See section 2 EARTHWORK. Backfill must be placed symmetrically on each side of the structure in maximum 8" thick lifts. Each lift shall be compacted to a minimum of 90% relative to compaction. The aluminum culvert must be protected from unbalanced loads during construction.</p> <p>4.04 Certification: Submit certificate of compliance that samples representing each lot used in the aluminum culvert have been tested and inspected as specified herein, and found in compliance with these specifications.</p> <p>5 -- STRUCTURAL STEEL:</p> <p>5.01 Materials:</p> <p>A. Structural steel shapes, bars and plates: ASTM A36.</p> <p>B. Strips and sheets: ASTM A570 Grade D.</p> <p>C. Pipes: ASTM A 53 Grade B.</p> <p>D. Tubular shapes: ASTM A500 Grade B.</p> <p>E. Welding rod: E70xx, conforming with American Welding Society "Specification for Welding Electrodes" of classification number suitable for the work to be done.</p> <p>F. Bolts and nuts:</p> <ol style="list-style-type: none"> Machine bolts: Galvanized ASTM A307. Bolts shall have cut threads. Bolts with rolled threads are not permitted. High strength bolts: <ol style="list-style-type: none"> For steel to steel connections: ASTM A325. For steel to concrete connections: ASTM A449. Nuts: ASTM A563 <p>G. Primer: Use low VOC primer only where use of primary primer is required. Obtain written permission of the Engineer. Do not paint galvanized surfaces.</p> <ol style="list-style-type: none"> Primary primer: Rust-Oleum 769 Damp Proof Red Primer. Low VOC Primer: Rust-Oleum 3400 System Low VOC Primer, Red or Grey. <p>H. Zinc rich paint: Galvalloy as manufactured by Metalloy Products Company or Devcon Z, a product of Devcon Corporation.</p> <p>5.02 Welding: Fabrication shall be in accordance with the current Structural Welding Code, by the American Welding Society. All welding shall be performed only by experienced operators who have previously qualified by tests as prescribed in the "Qualifications Procedure" of the American Welding Society to execute the type of weld detailed.</p> <p>5.03 Bolted connections: Holes shall be 1/16" larger than bolt diameter. Holes for anchor bolts may be 1/8" larger than bolt diameter. Provide standard cut washers below heads and nuts which occur against a material other than steel and at slotted or oversize holes in steel elements. Provide case hardened washers at nuts at high strength bolts.</p> <p>5.04 Galvanizing: Galvanize all rail elements as specified in Caltrans Standard Specifications. Touch-up all damaged areas with two coats of zinc rich paint.</p> <p>5.05 Painting: At all steel not galvanized or embedded in concrete, clean metal by mechanical means, such as sandblasting or wire brushing as required to remove all scale, rust, etc., and with mineral spirits as required to remove all oil, grease, etc. Paint with one coat of primer. After erection, touch-up all abraded places, field connections, and welds with primer.</p> <p>5.06 Erection: All incorrectly fitting elements encountered in the field shall be reported to the Engineer. Method of correction of such errors shall be subject to the Engineer's acceptance. No field cutting, fitting, welding or other such fabrication is permitted unless specifically shown on the drawings. Grout or drypack shall be installed and cured prior to loading the element it supports.</p>	<div>  <p>Contractor shall assume sole and complete responsibility for the job site conditions during the course of this project including safety of all persons and property. This requirement shall apply continuously, and the Engineer shall not be held responsible for any liability arising from the sole negligence of the Engineer or Owner. These plans and specifications, and the ideas and designs incorporated herein, are instruments of service and shall not be used in whole or in part for any other project without written authority of Applied Engineering. Copyright © 1998 Applied Engineering. All rights reserved. Copies of this drawing shall have this notice.</p> </div> <div> <p>PENNINGTON CREEK BRIDGE ARCH & HEADWALLS GENERAL STRUCTURAL NOTES</p> <p>FOR: MAINO CONSTRUCTION COMPANY SAN LUIS OBISPO, CALIFORNIA</p> </div> <div>  <p>BY: RKN,DMC,JCB DATE: 04-SEP-98 JOB#: 298057 SHEET S-1.1</p> </div>
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REFERENCE NOTES

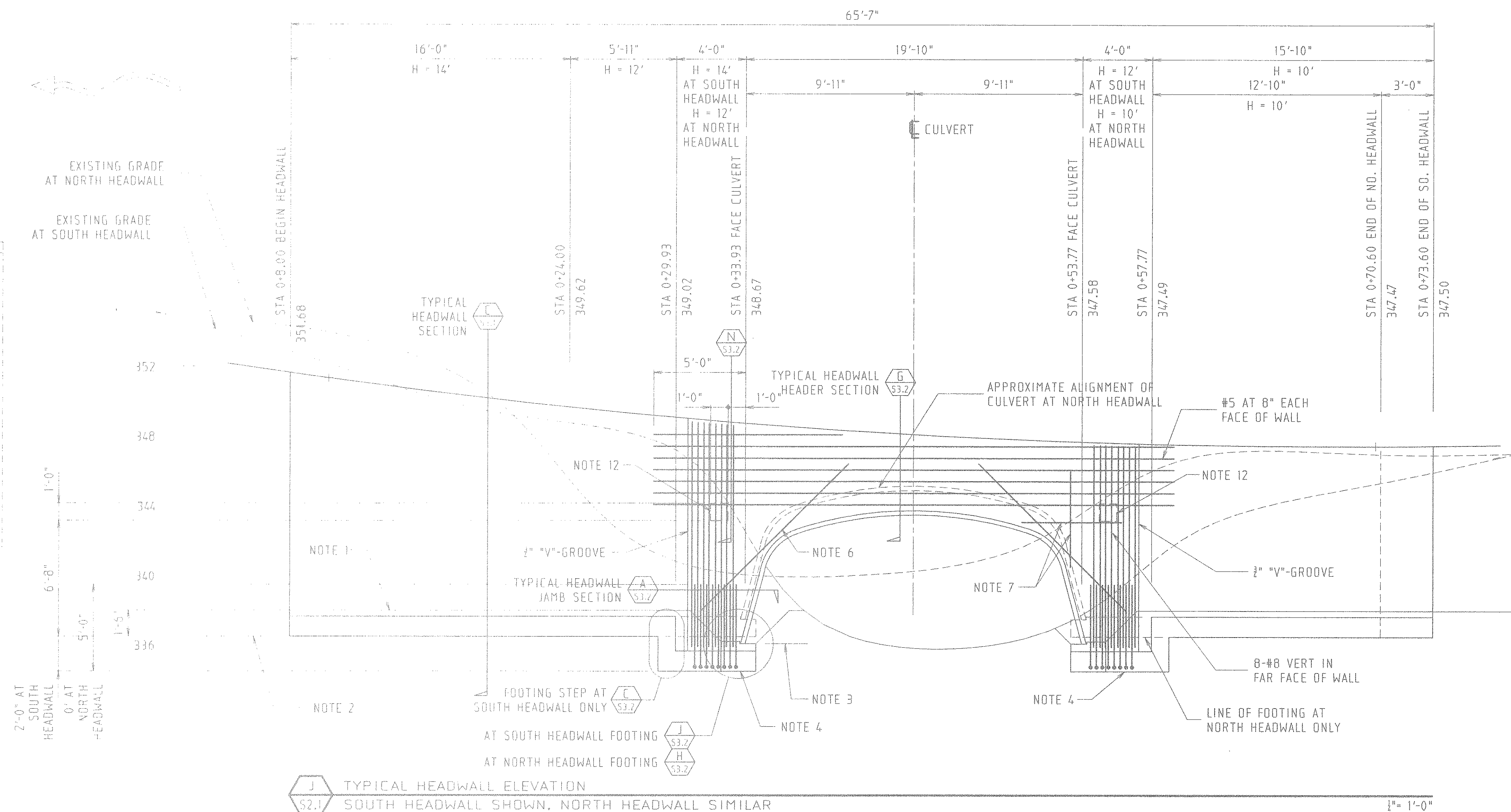
- TOP OF BEDROCK TO BE ESTABLISHED BY GEOTECHNICAL ENGINEER ANTICIPATED AT APPROXIMATELY ELEVATION 338.0.
- BOTTOM OF HEADWALL FOOTING ELEVATION = 336.5 TYPICAL UNLESS OTHERWISE SHOWN
- TOP OF CULVERT FOOTING ELEVATION VARIES 336.1' AT SOUTH HEADWALL, 337.5 AT NORTH HEADWALL
- BOTTOM OF HEADWALL FOOTING ELEVATION = 334.5' ADJACENT TO CULVERT AT SOUTH HEADWALL ONLY. BOTTOM OF HEADWALL FOOTING ELEVATION = 336.5' TYPICAL AT NORTH HEADWALL
- CONSTRUCT THREE-PLATE ALUMINUM BOX CULVERT PER CONTECH CONSTRUCTION PRODUCTS, INC. SPAN "A" = 19'-10", RISE "B" = 7'-8", WITH MINIMUM COVER OF 2'-6" AND MAXIMUM COVER OF 5'-0".
- #6 x 12'-0" DIAGONAL EACH FACE OF WALL
- #4 AT 1'-6" EACH WAY EACH FACE OF WALL BETWEEN DIAGONAL BARS AND MAIN WALL REINFORCING LAP 2'-0" WITH MAIN WALL REINFORCING
- 4"Ø PERFORATED DRAIN, SLOPE TO DRAIN THROUGH HEADWALL
- THREE BEAM BARRIER IN ACCORDANCE WITH APPLICABLE DETAILS OF STANDARD PLANS A78A THROUGH A78F AND DETAIL B 53.2 TYPICAL ALL ALONG EACH HEADWALL NOT SHOWN ELSEWHERE
- THREE BEAM BARRIER TRANSITION SECTION TO METAL BEAM GUARD RAIL PER STANDARD PLAN A78C WITH 10x10 x 5'-4" POST OUTSIDE THE END OF HEADWALL. TYPICAL EACH END EACH HEADWALL
- METAL BEAM GUARD RAIL WITH TYPE 1 FLARE PER APPLICABLE DETAILS ON STANDARD PLANS A77B THROUGH A77K TYPICAL EACH END EACH HEADWALL. NOT SHOWN IN FULL AND NOT SHOWN ELSEWHERE
- LINE OF TIE BEAM BETWEEN HEAD WALLS SEE P 53.2



BOX CULVERT SHELL DATA	
HAUNCH GAGE	2 = (.125")
HAUNCH PLATE LENGTH	125 1/8"
HAUNCH RIB SPACING	18"
CROWN GAGE	5 = (.200")
CROWN RIB SPACING	9"

REFERENCE DRAWINGS

DRAWINGS TITLED "Rancho El Chorro Culverts, Pennington Creek Riparian Enhancement Project", SHEETS 4, 5 & S-1 DATED 8/4/97 PREPARED BY JOHN L. WALLACE & ASSOCIATES, (SHEETS 4 & 5), AND BY APPLIED ENGINEERING, (SHEET S-1) .



PENNINGTON CREEK BRIDGE ARCH & HEADWALLS
ALUMINUM BOX CULVERT PLAN AND SECTION

FOR: MAINO CONSTRUCTION COMPANY
SAN LUIS OBISPO, CALIFORNIA

APPLIED
ENGINEERING
P.O. Box 405
1008 Pico Lane N2
San Luis Obispo, California 93401
805/544-5884

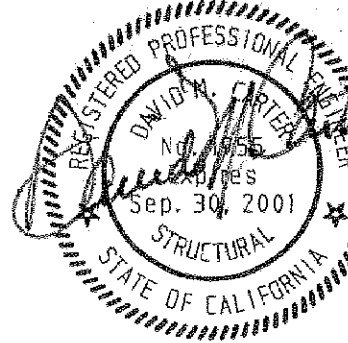
BY: RKN,DMC,JCB

DATE: 23-SEP-98

JOB: 298057

SHEET

S-2.1



Contractor shall assume sole and complete responsibility for the job site conditions during the construction of this project including safety of all persons and property. This requirement shall apply continuously, and not be limited to normal working hours. The Contractor shall defend, indemnify and hold the Engineer and his firm harmless from and against all claims, damages, costs and expenses, including reasonable attorney's fees, which may be asserted against or incurred by the Engineer or his firm in connection with or arising from this project except for liability arising from the sole negligence of the Engineer or his firm. These plans and specifications, and the ideas and designs incorporated herein, are instruments of service prepared by the Engineer for the construction of the work shown hereon, and the property of Applied Engineering, and shall not be used in whole or in part for any other project without written authority of Applied Engineering. Copyright © 1999 Applied Engineering. All rights reserved. Copies of this drawing shall have this notice.

PENNINGTON CREEK BRIDGE ARCH & HEADWALLS
CULVERT AND HEADWALL DETAILS
FOR: MAINO CONSTRUCTION COMPANY
SAN LUIS OBISPO, CALIFORNIA

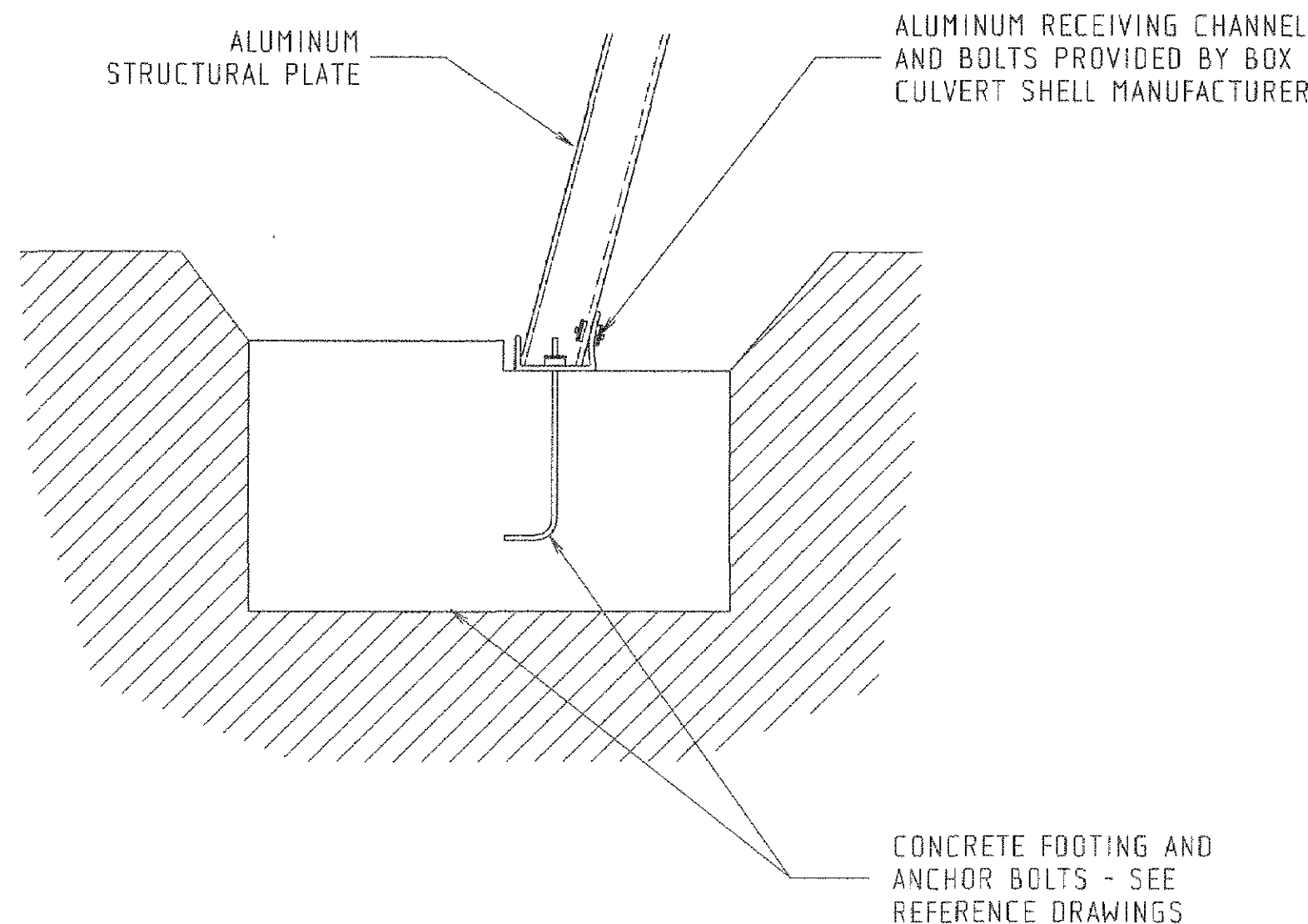
APPLIED
ENGINEERING
808 Fiero Lane
San Luis Obispo, California 93402
805/544-5604

BY: RKN,DMC,JCB

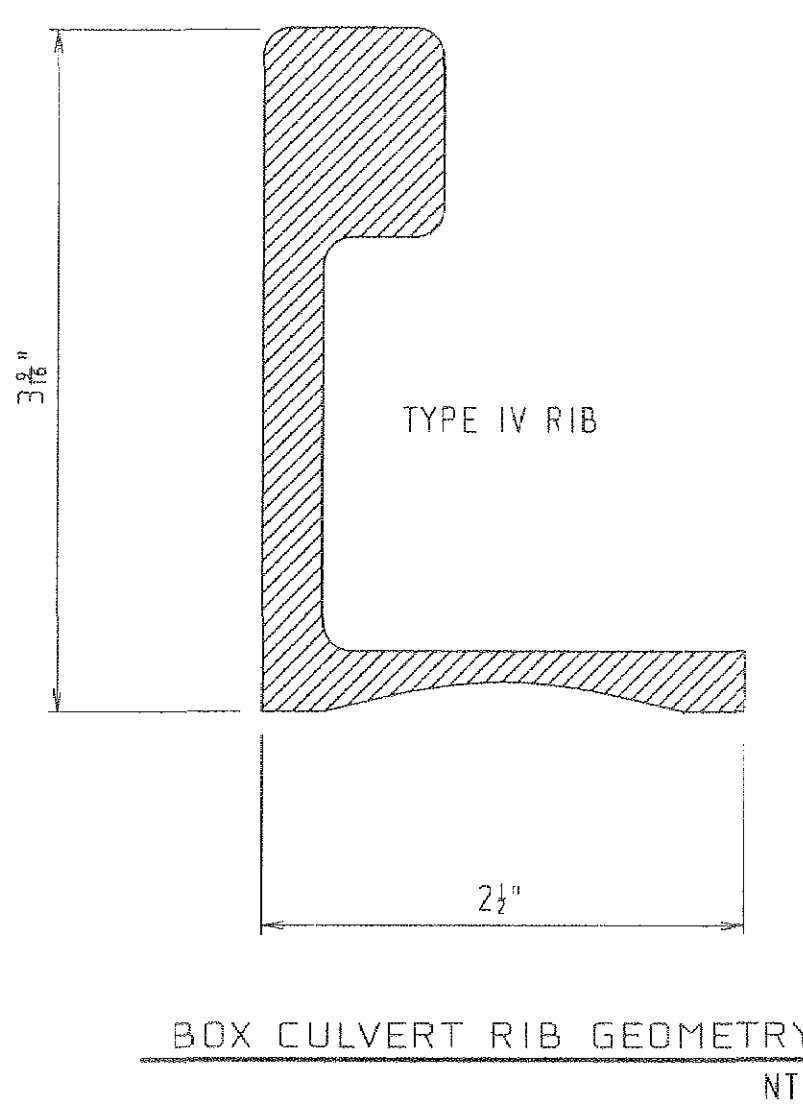
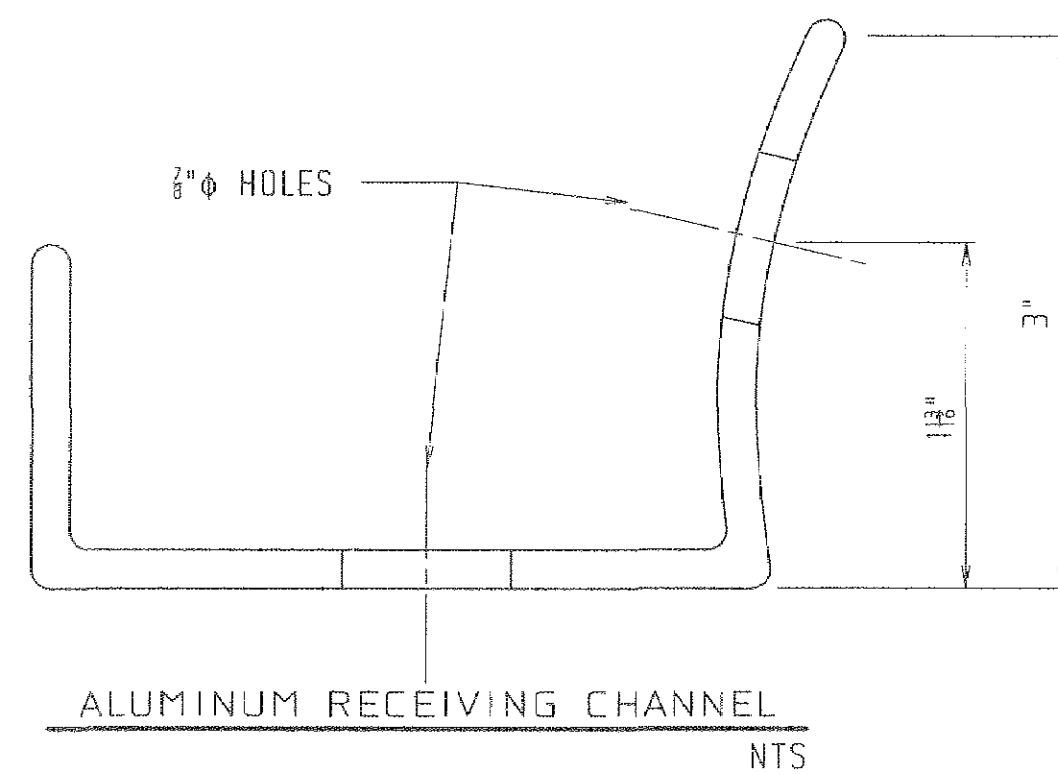
DATE: 04-SEP-98

JOB: 298057

SHEET
S-3.1

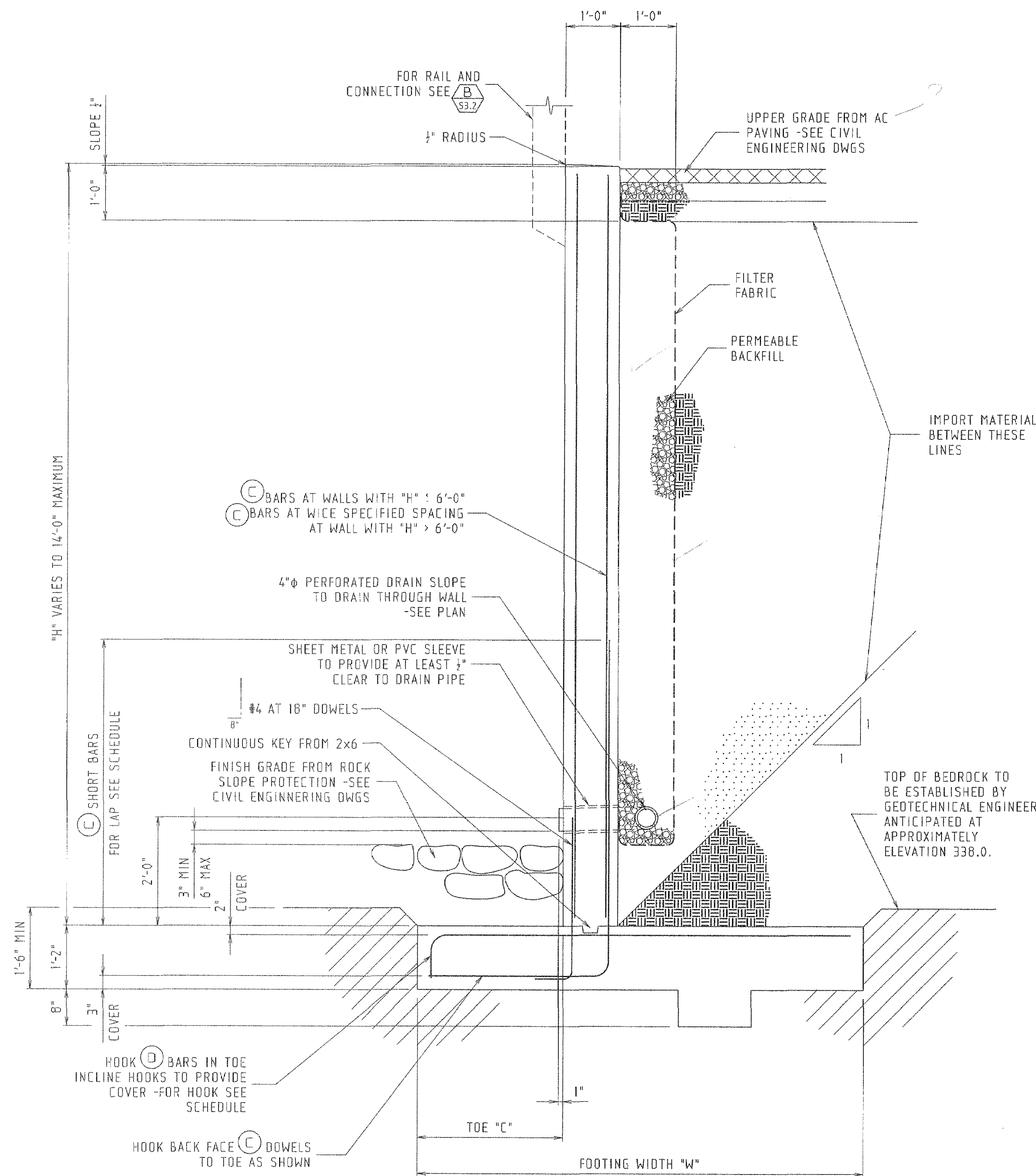


CONCRETE FOOTING WITH RECEIVING CHANNEL
1/2" = 1'-0"

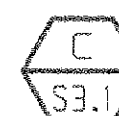


HOOK AND LAP SCHEDULE		
BAR SIZE	LAP	HOOK
#5	3'-9"	1'-0"
#6	4'-6"	1'-0"
#7	5'-3"	1'-2"
#8	6'-0"	1'-4"

TABLE OF REINF STEEL DIMENSIONS & DATA	
DESIGN H	14'-0"
W	8'-2"
C	2'-8"
B	5'-6"
C BARS	#7 AT 6"
D BARS	#8 AT 12"
CASE 1 TOE PRESSURE	3200
FOR "H" < 14'-0" SEE B3-3	

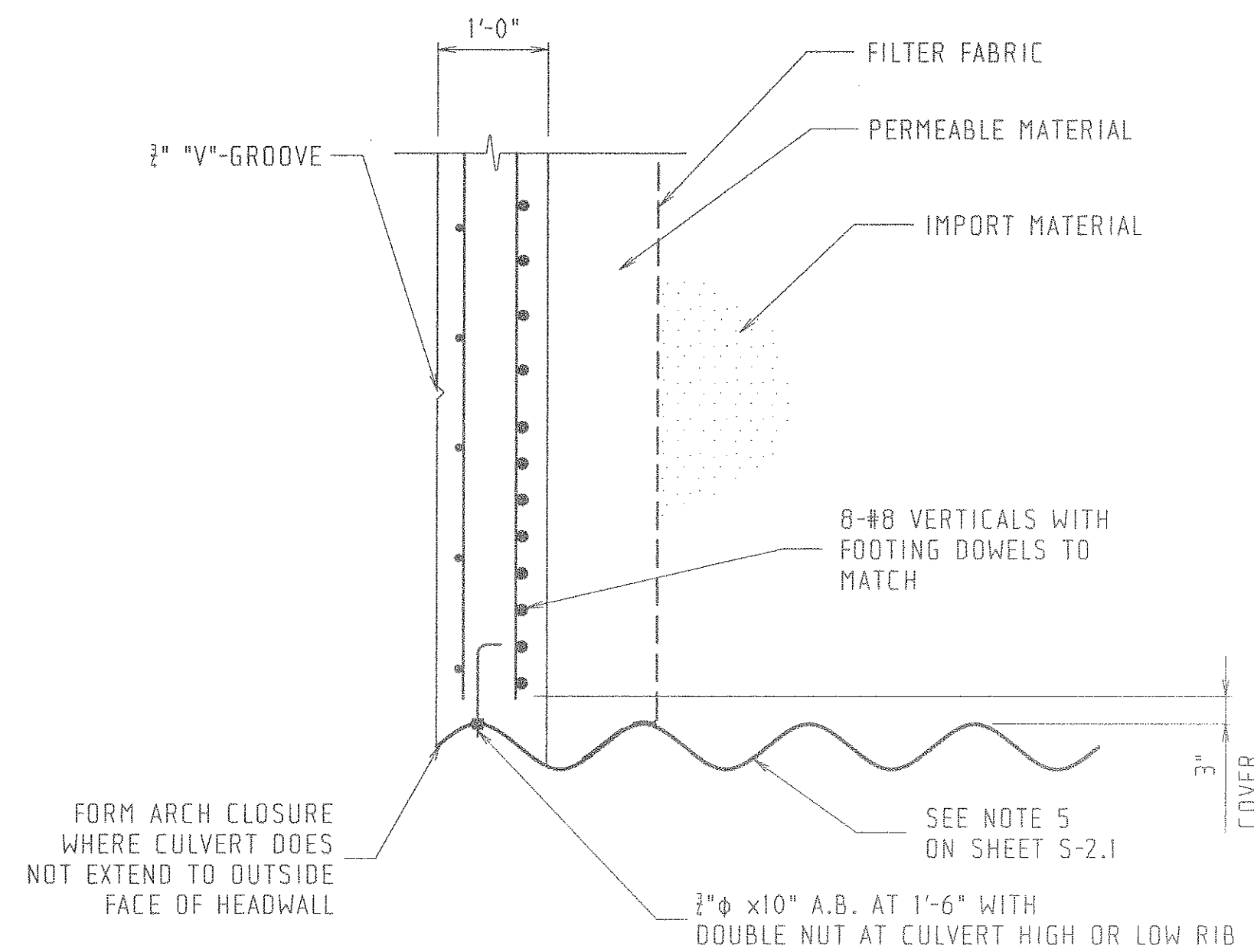


FOR ALL ITEMS NOT SHOWN OR NOTED SEE
RETAINING WALL TYPE 1A CALTRANS STANDARD PLAN B3-3

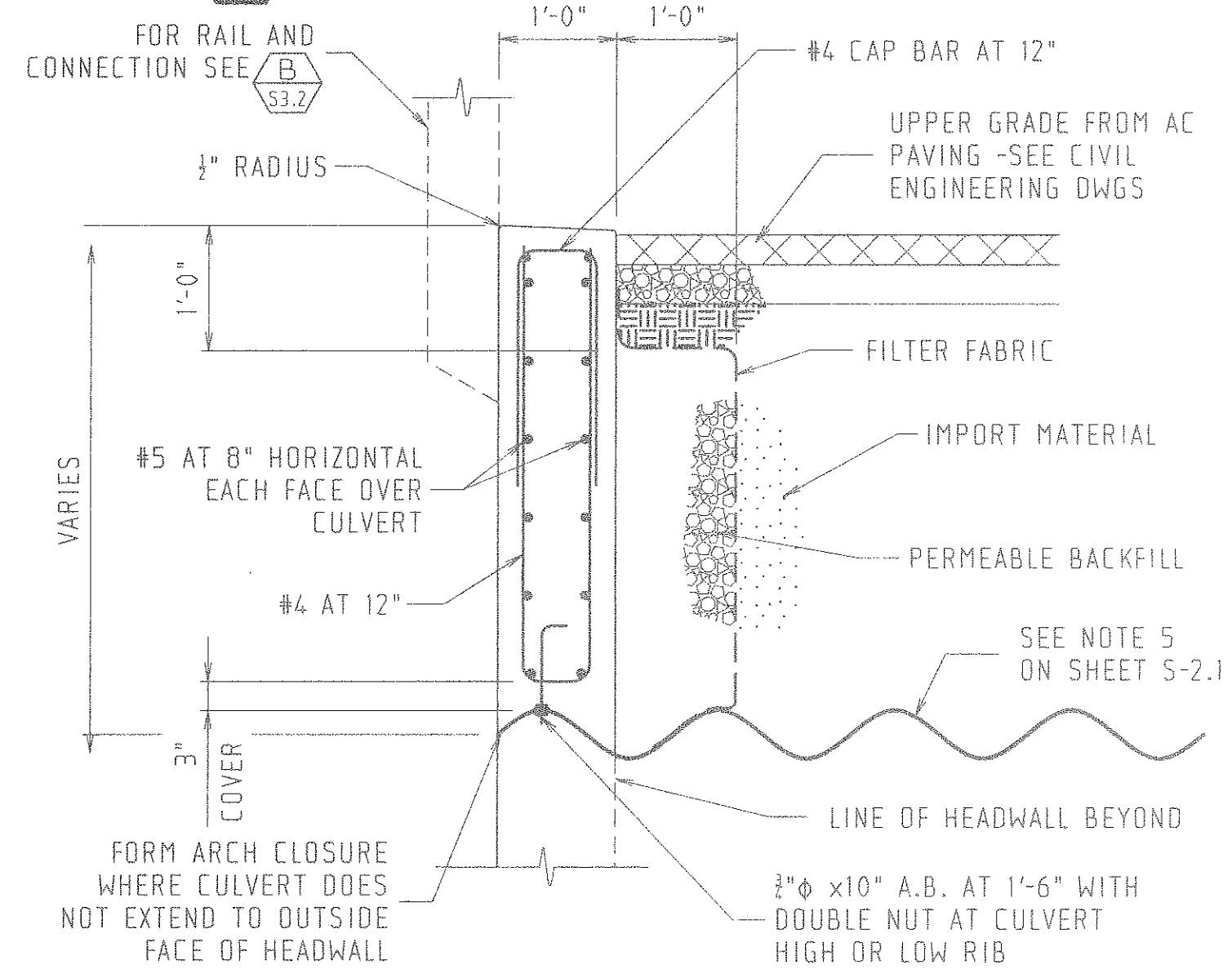


TYPICAL HEADWALL SECTION

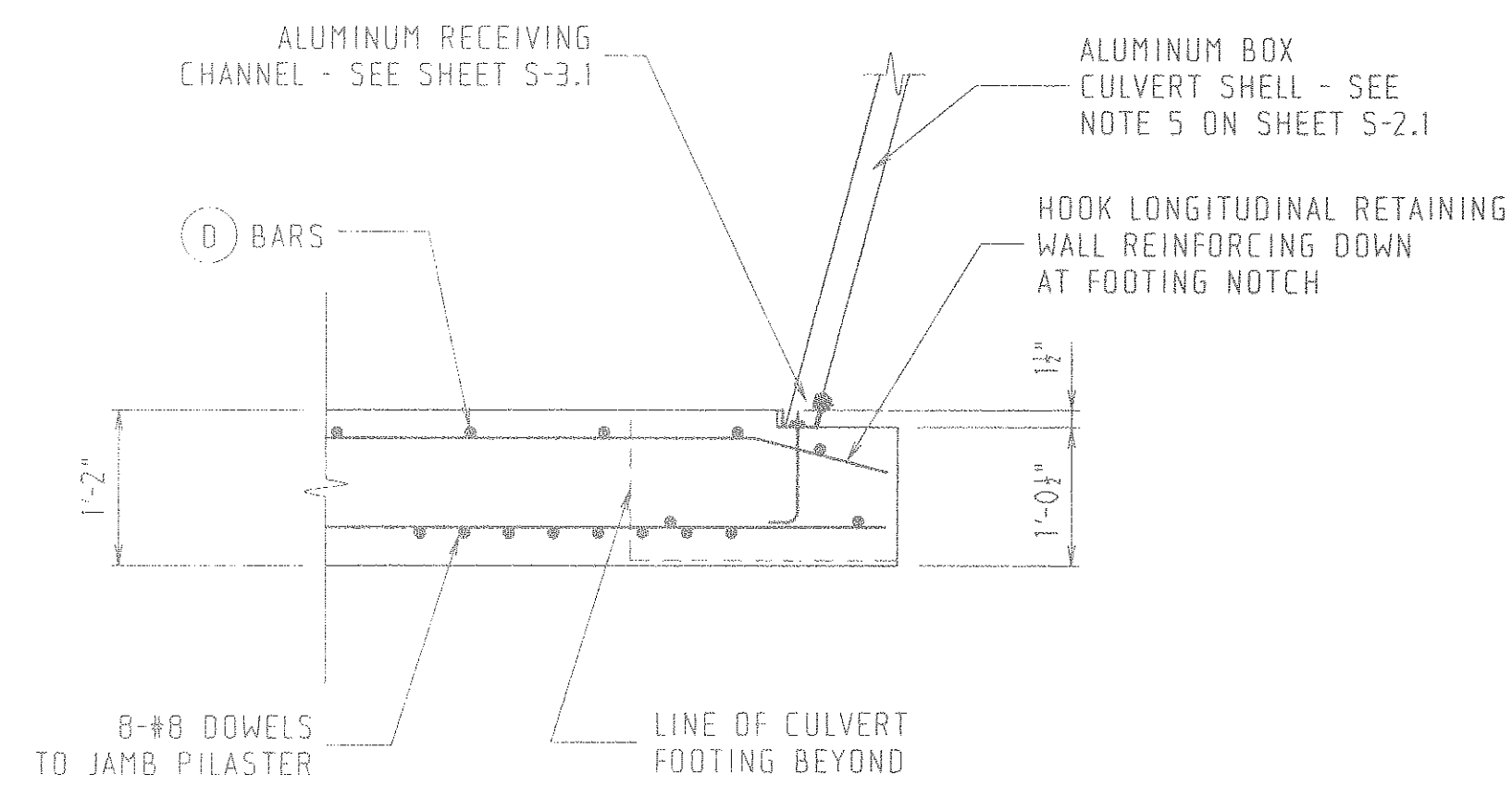
1/2" = 1'-0"



A
S3.2 HEADWALL CULVERT JAMB SECTION
3/4" = 1'-0"

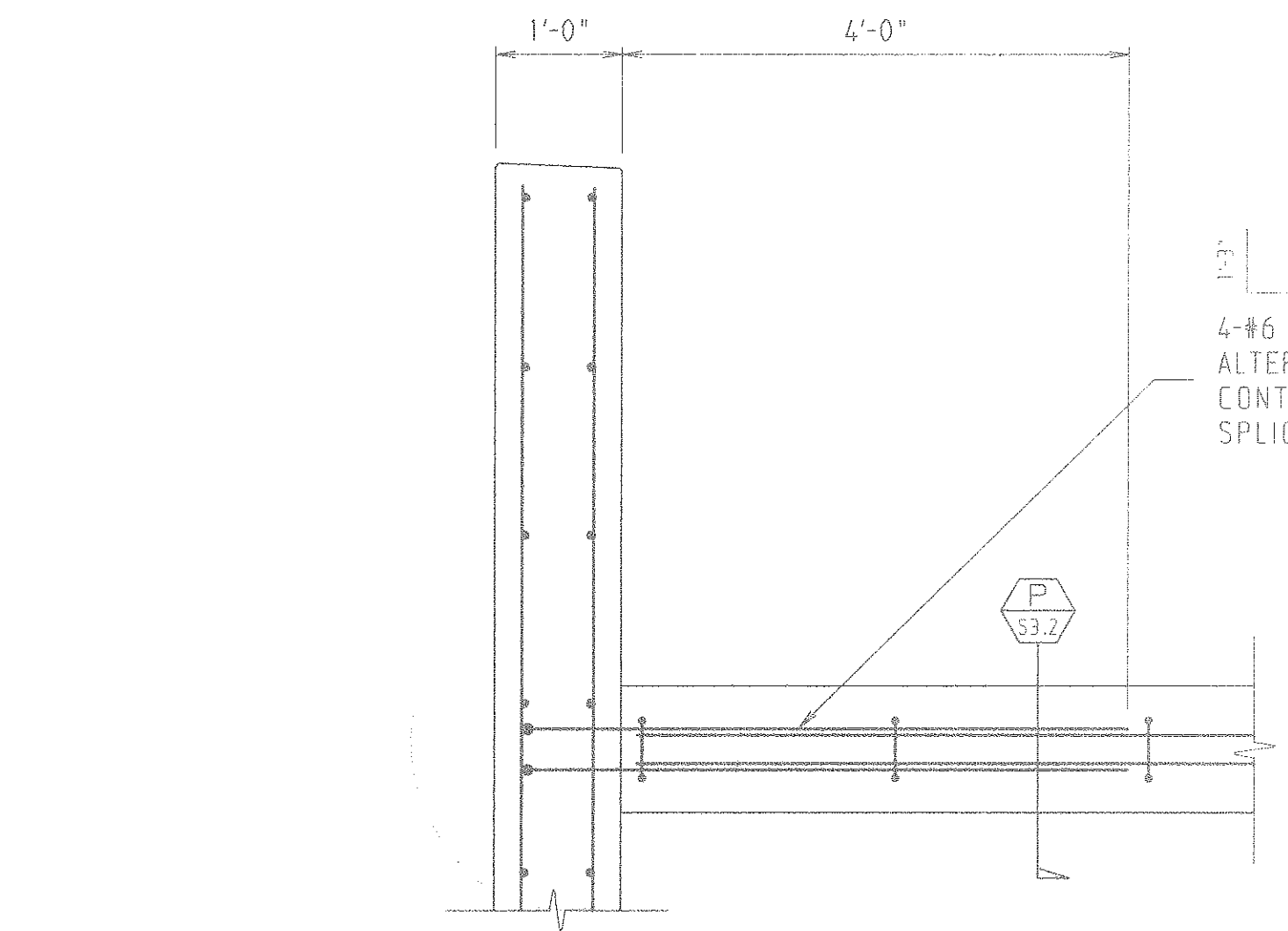


B
S3.2 TYPICAL THRIE BEAM BARRIER SECTION
3/4" = 1'-0"



C
S3.2 TYPICAL STEPPED FOOTING ELEVATION
NO SCALE

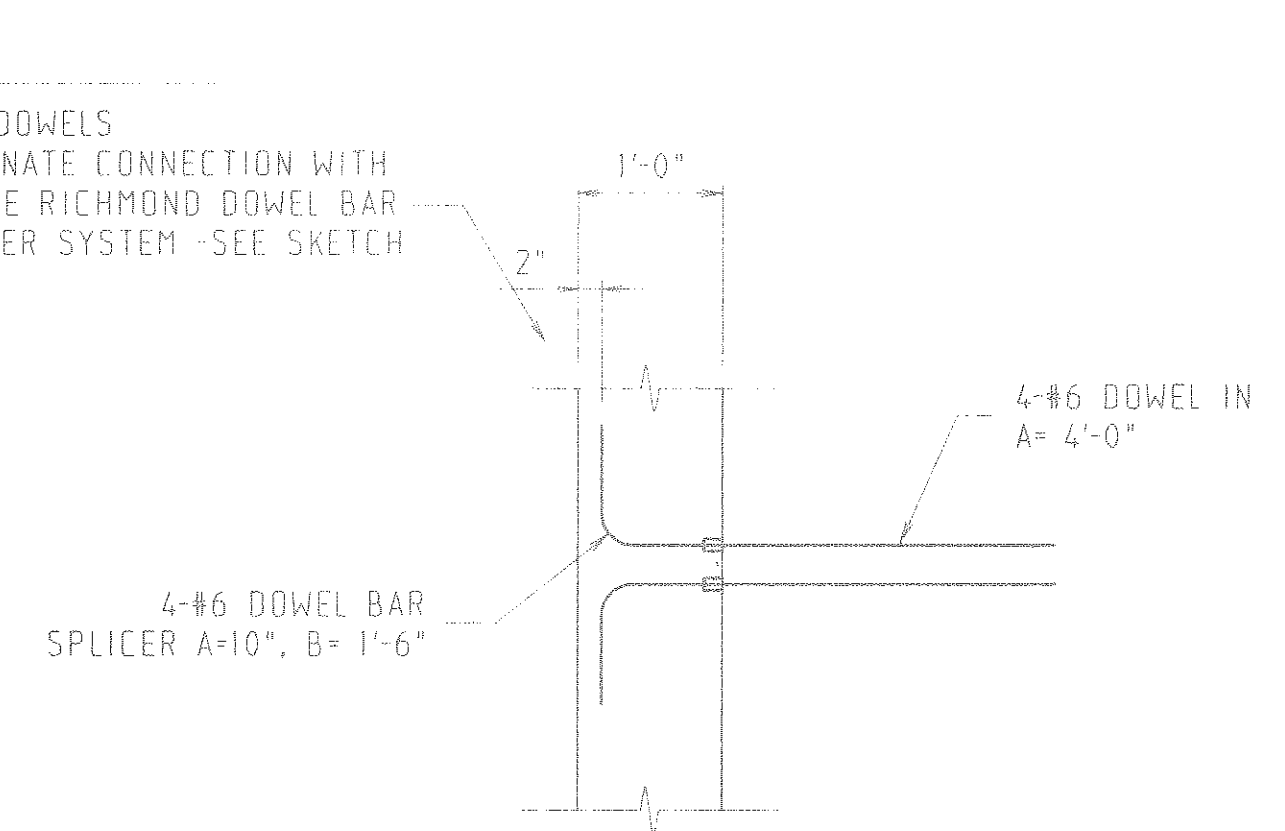
G
S3.2 HEADWALL CULVERT HEADER SECTION
3/4" = 1'-0"



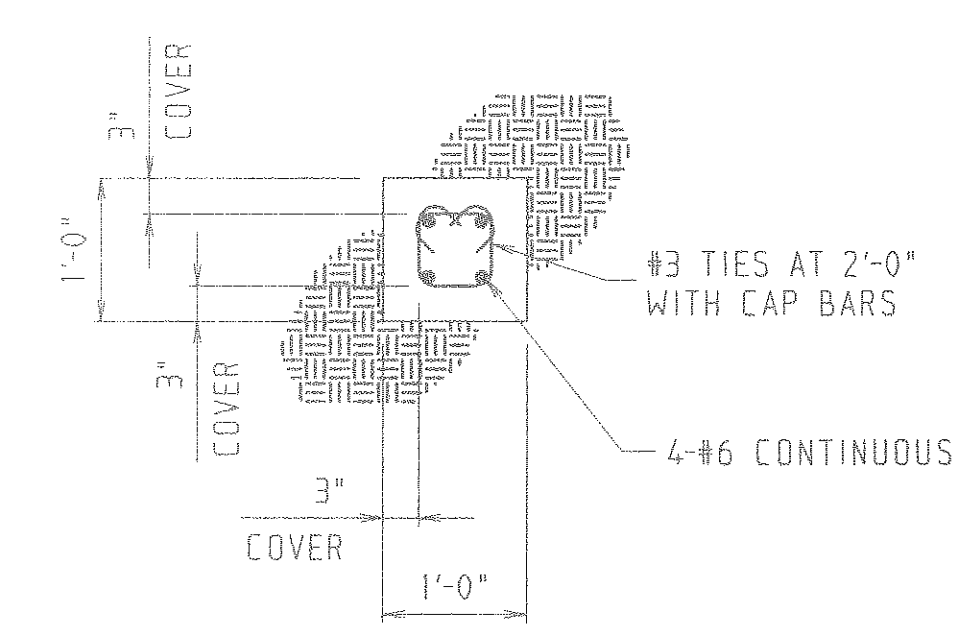
H
S3.2 LONGITUDINAL FOOTING SECTION AT CULVERT
AT NORTH HEADWALL
3/4" = 1'-0"

J
S3.2 LONGITUDINAL FOOTING SECTION AT CULVERT
AT SOUTH HEADWALL
3/4" = 1'-0"

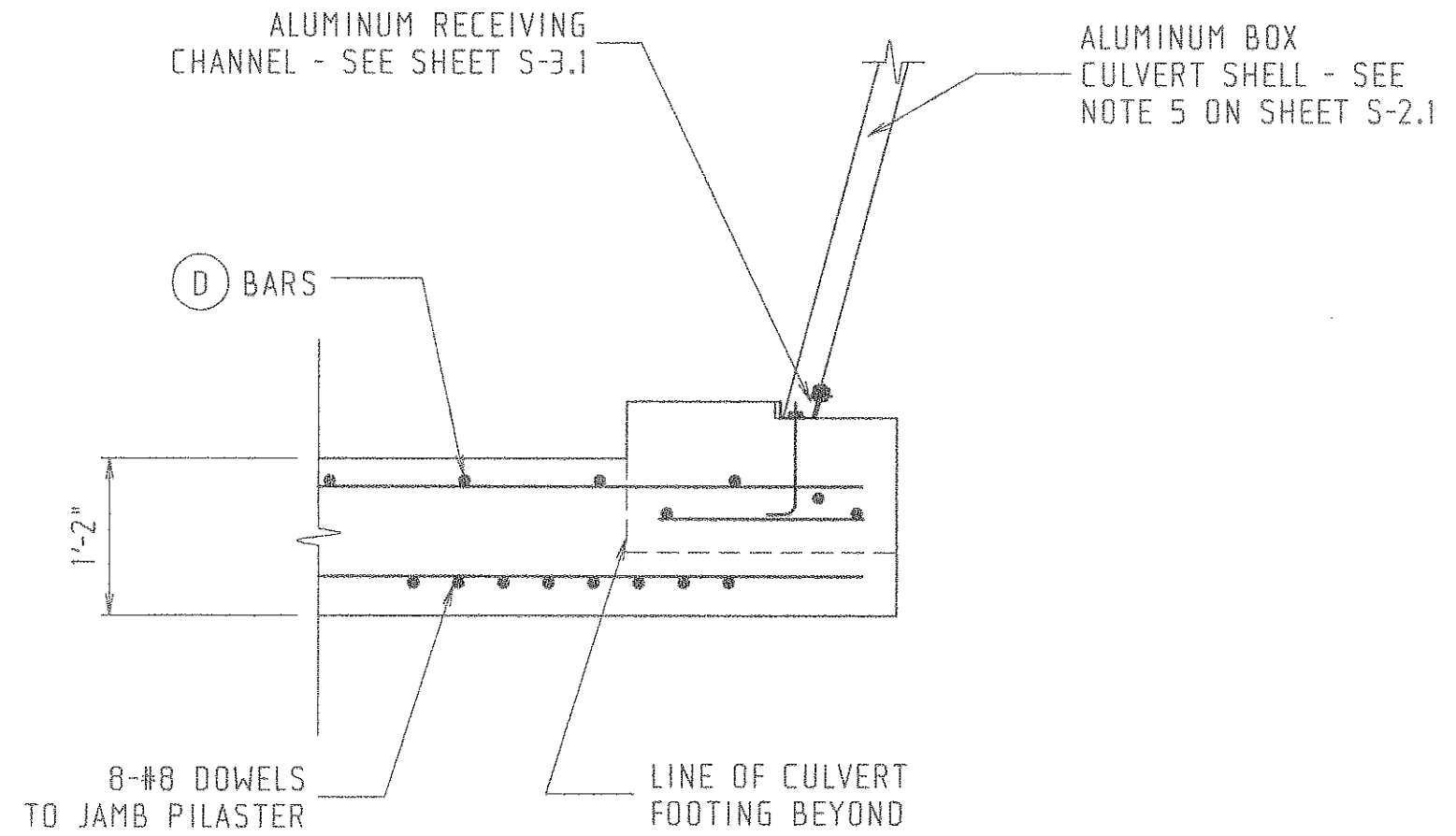
N
S3.2 TIE BEAM CONNECTION DETAIL
3/4" = 1'-0"



P
S3.2 TIE BEAM SECTION
3/4" = 1'-0"



J
S3.2 LONGITUDINAL FOOTING SECTION AT CULVERT
AT SOUTH HEADWALL
3/4" = 1'-0"



PENNINGTON CREEK BRIDGE ARCH & HEADWALLS
CULVERT HEADWALL DETAILS
FOR: MAINO CONSTRUCTION COMPANY
SAN LUIS OBISPO, CALIFORNIA

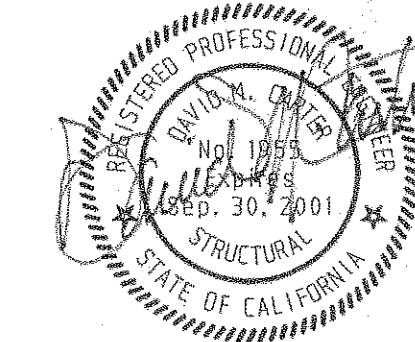
APPLIED
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BY: RKN,DMC,JCB

DATE: 23-SEP-98

JOB: 298057

SHEET
S-3.2



Contractor shall assume sole and complete responsibility for the job site conditions during the course of construction. The Engineer shall not be held responsible for any and all liability, real or alleged, in connection with performance of work on this project except for liability arising from the sole negligence of the Engineer or Engineer's employee. The Engineer's services are not to be used in whole or in part for any other project without written authority of Applied Engineering. Copyright © 1998 Applied Engineering. All rights reserved. Copies of this drawing shall have this notice.