



LAS POSITAS COLLEGE CHILD DEVELOPMENT CENTER

ADDENDUM No. 3

PROJECT: Las Positas Child Development Center
3033 Collier Canyon Road,
Livermore, CA

DATE: 12/05/2008

OWNER: Chabot Las Positas Community College District
5020 Franklin Drive
Pleasanton, CA 94588

DSA FILE No.: 1-C2

DSA APP. No.: 01-109257

Notice is hereby given to all prospective bidders that plans and specifications on the subject project are modified as hereinafter set forth. This Addendum shall be attached to and form a part of the plans and specifications. All bidders must acknowledge receipt of this addendum on the Bid Form. In case of difference with previous addenda or communications, this addendum takes precedence.

It is the responsibility of all bidders to notify all subcontractors from whom they request bids and from whom they accept bids of all changes contained in this addendum.

GENERAL INFORMATION

Item No. G-1

Reference: **Bid Schedule**
Description A: **Change** date for BIDS DUE to Thursday, December 18, 2008 at 2:00 PM at District Office, 5020 Franklin Drive, Pleasanton, CA.

Item No. G-2

Reference: **Bid Questions (RFI)**
Description A: Latest Time/Date for RFI's submittals shall remain as Thursday, December 04, 2008 at 2:00 p.m. and shall not be extended. Any bid questions submitted after this date shall be responded to at the Pre-Construction Meeting.

Item No. G-3

Reference: **Special Conditions, Contract Time (4.1), Notice to Proceed (NTP)**
Description A: The Contract Time for the Contractor's Substantial Completion of the Work is Five Hundred and Twenty-Eight (528) Calendar Days after the date for commencement of the Work as set forth in the Notice to Proceed issued by or on behalf of the District to the Contractor. The anticipated estimate date for the Notice to Proceed to be issued will be no later than March 31, 2009.

Item No. G-4

Reference: Addendum No. 2
Description A: **Clarification:** Revise header of reissued specification Section 09310 to read "Addendum No. 2" instead of "Alternate No. 2".

Item No. G-5

Reference: Audio Terminal Panel
Description A: One Audio System Terminal Panel (TP) for each classroom shall be included in the Observation Rooms. Provide (2) 1 ¼" conduits from each terminal panel at the Observation rooms to the terminal panel at the equipment rack location. Audio wirings shall be pulled with in one of the two conduits and shall be part of the contract. The second conduit shall be used for future video cabling.

Item No. G-6

Reference: Video equipment
Description A: All video equipment and cabling are NIC. The infrastructure for the video system (conduits, back boxes, terminal panels, etc...) are included and shall be installed by the contractor. Exact locations of these panels, boxes shall be determined by the Architect in accordance with the system diagrams provided.

PROJECT MANUAL - VOLUME 1

Item No. PM1-1

Reference: Section 01630 - Product Options and Substitutions
Description A: **Clarification:** Article 1.03 SUBSTITUTIONS of this Section itemizes "District Standard" systems, products, and/or materials for which there is "No Substitution" except as indicated. These "District Standards" shall supersede any other systems, products, materials, and/or manufacturers that may be included in other specification sections.

PROJECT MANUAL - VOLUME 2

Item No. PM2-1

Reference: Section 02300 - Earthwork and Grading
Description A: **Replace** previously revised Section 02300 - Earthwork & Grading that was reissued by Addendum No. 2 with newly revised attached Section 02300 - Earthwork and Grading.

Item No. PM2-2

Reference: Section 02315 - Trenching, Backfilling and Compacting
Description A: **Replace** previously revised Section Section 02315 - Trenching, Backfilling & Compacting that was reissued by Addendum No. 2 with newly revised attached Section 02315 - Trenching, Backfilling and Compacting.

Item No. PM2-3

- Reference:** **Section 02700 - Site Furnishings**
- Description A: **Add** Article 2.4. as follows:
"2.4 BIKE RACKS
A. Model "Pi Bike Rack", Black powder coated, as manufactured by Landscapeforms, Inc., phone: 888-422-3624 or 510-594-1777, website: www.landscapeforms.com, or approved equal.
1. Provide (5) bike racks surface mounted to concrete pads at locations indicated on the Drawings."
- Description B: **Add** Article 2.5. as follows:
"2.5 SKATEBOARD DETERRENT
A. Model: FA 90 Brackets as manufactured by Skate Stoppers, El Cajon, CA, phone: 619-447-6374, website: www.skatestoppers.com, or approved equal."

Item No. PM2-4

- Reference:** **Section 02821 - Chain Link Fences & Gates**
- Description A: **Revise** 2.2.C. Fence Schedule to read as follows:
"END & CORNER POSTS: Size shall be 2-1/2-inch O.D. and 3.65 lb/ft"
"LINE POSTS: Size shall be 2-inch O.D. and 2.72 lb/ft"

Item No. PM2-5

- Reference:** **Section 06201 - Exterior & Interior Finish Carpentry**
- Description A: **Add** Sentence 3.5.A.1. as follows:
"1. Provide 1/4-inch x 2-inch cedar lath installed over building paper at 16-inches on center (spacing to match wood stud locations) to provide for a continuous drainage cavity behind cedar siding."

Item No. PM2-6

- Reference:** **Section 06402 - Interior Architectural Woodwork**
- Description A: **Revise** Paragraph 1.2.A.1.a-b. to read as follows:
"1. Shop finished architectural woodwork, constructed of formaldehyde-free MDF, with veneer types as follows:
a. Type 1: Transparent finished wood veneers for all architectural woodwork indicated for Administration Building A.
b. Type 2: Plastic laminate clad veneers for all architectural woodwork indicated for both Toddler Building B and Preschool Building C."
- Description B: **Delete** Paragraph 2.1.B.2.a-b.
- Description C: **Revise** Sentence 2.1.B.3. to read as follows:
"3. Wood Veneer-Faced Panel Products:"
- Description D: **Revise** Sentence 2.5.B.4.a. to read as follows:
"a. Provide WilsonArt or Pionite (District Standards) as selected by Architect from manufacturer's full range."

Item No. PM2-7

Reference: Section 06650 - Solid Polymer Fabrications

Description A: **Revise** Sentence 2.2.B.1. to read as follows:

"1. Provide Veritas™ Point System (1-inch-diameter) including Caps, 1/4-inch-Standoff-Barrels, and wall anchors, complete with all components and accessories to install wall panels in layouts as indicated on the Drawings."

Description B: **Revise** Sentence 2.2.B.2. to read as follows:

"2. Provide minimum of 4 mounting brackets per panel located at each corner of panels, with additional brackets as needed to support panel size; exact bracket locations shall be in accordance with approved shop Drawings."

Description C: **Add** Paragraph 3.2.F. to read as follows:

"F. Align panel ends with window frames above as applicable and as shown on Architect- reviewed shop drawings. Overlap panels at corners to provide for tight fit with no gaps. Terminate panels within 1-inch of abutting surfaces. All exposed panel edges to be beveled and ground smooth."

Item No. PM2-8

Reference: Section 07131 - Self-Adhering Sheet Waterproofing

Description A: **Add** Sentence 1.1.B.3. as follows:

"3. Provide sheet waterproofing system at retaining walls and planters walls between northwest corner of Toddler Building and northeast corner of Preschool Building."

Item No. PM2-9

Reference: Section 08800 - Glazing

Description A: **Delete** Sentence 2.2.E.3.

Item No. PM2-10

Reference: Section 09310 - Ceramic Tile

Description A: **Revise** Sentence 2.1.B.3.

"3. Floor Tile, Type CT-2: Daltile *Porcelain*™ Unglazed Porcelain Tile; size: 8-inch by 8-inch, with matching 6-inch-high by 8-inch-wide coved base; provide color as selected by Architect from manufacturer's full range of colors."

Item No. PM2-11

Reference: Section 09652 - Resilient Flooring

Description A: **Delete** Item 2.1.A.1.a.

Description B: **Revise** Item 2.1.A.1.b. to read as follows:

"b. Forbo Industries, Inc., Marmoleum Dual. District Standard. No Substitutions."

Item No. PM2-12

Reference: Section 09653 - Resilient Wall Base & Accessories

Description A: **Delete** Item 1.1.B.2.

- Description B: **Revise** Item 2.3.A.1. to read as follows:
"1. Burke Mercer Flooring Products. District Standard. No Substitutions."
Description C: **Delete** Items 2.3.A.2. and 2.3.A.3.

Item No. PM2-13

Reference: Section 09911 - Exterior Painting

- Description A: **Revise** Sentence 2.1.A.1. to read as follows:
"1. Paint systems scheduled at the end of this section are by Kelly Moore and are District Standard products."
Description B: **Revise** Sentence 2.1.A.2. to read as follows:
"2. "No Substitutions" shall be allowed unless otherwise approved by the District as indicated in Section 01630 - Product Options and Substitutions."
Description C: **Delete** Sentences 2.1.A.3., 2.1.A.4., and 2.1.A.5.a-e.

Item No. PM2-14

Reference: Section 09912 - Interior Painting

- Description A: **Revise** Sentence 2.1.A.1. to read as follows:
"1. Paint systems scheduled at the end of this section are by Kelly Moore and are District Standard products."
Description B: **Revise** Sentence 2.1.A.2. to read as follows:
"2. "No Substitutions" shall be allowed unless otherwise approved by the District as indicated in Section 01630 - Product Options and Substitutions."
Description C: **Delete** Sentences 2.1.A.3., 2.1.A.4., and 2.1.A.5.a-e.

Item No. PM2-15

Reference: Section 10170 - Phenolic Toilet Screens

- Description A: **Revise** Sentence 2.1.B.2. to read as follows:
"2. Bobrick Washroom Equipment, Inc. District Standard, No Substitutions."
Description B: **Delete** Sentences 2.1.B.1., 2.1.B.3., 2.1.B.4., and 2.1.B.5.

Item No. PM2-16

Reference: Section 11130 - Audiovisual System

- Description A: Under Part 1.1.C, **Delete** reference to sheet TA7.1.
Description B: Under Part 3.8 - Major Equipment List, **Revise** (76) microphones to (53) microphones.
Description C: Under Part 3.8 - Major Equipment List, **Revise** Microphone preamplifier from Peavey A/A-8P to Shure SCM-800 mixer to match what shown on TA-4.1.

Item No. PM2-17

Reference: Section 16325 - Primary Voltage Transformer, Pad-Mounted

- Description A: **Change** manufacturer listed in Item 2.04.A. to the following:
"A. Eaton."

Item No. PM2-18

Reference: Section 16461 - Dry Type Distribution Transformers
Description A: Revise Item 2.1.A. to read as follows:
"A. Power Smith. District Standard, No Substitutions."

LANDSCAPE DRAWINGS (LS - SERIES)

Item No. D-1

Reference: Drawing LS-101
Description A: Hermeocallis species, Anigozanthos species, Bioswale grasses species, Bioswale and bioretention plant material on center spacing are updated as shown on ADD3-LS1.
Description B: Crushed rock designation updated for clarification. See ADD3-LS2.

Item No. D-2

Reference: Drawing LS-104.1
Description A: Revise reference detail 4/LS-106 to 3/LS-106 as shown on ADD3-LS3.
Description B: Bike Rack specifications added to Section 02700 - Site Furnishings. See Item No. PM2-3 above.

Item No. D-3

Reference: Drawing 5/LS-106
Description A: Revise concrete wall edge radii to 1/8" as shown on attached ADD3-LS4.
Description B: Revise Note #3 on detail 5/LS-106 as shown on ADD3-LS5.

Item No. D-4

Reference: Drawing LS-106.1
Description A: Revise walls at sloped walkways to show skateboard deterrent and revised concrete wall edge radii to 1/8" as shown on attached ADD3-LS6.

Item No. D-5

Reference: Drawing LS-107
Description A: Irrigation previously shown in this contract north of the fire lane is part of the Parking Lot H contract and will be existing when the CDC project begins construction. This scope will be to restore/repair/replace irrigation equipment affected by the CDC contract, up to 10' behind the retaining wall. See ADD3-LS7.

Item No. D-6

Reference: Drawing LS-109
Description A: Planting scope up to 10' behind the retaining wall will be to install sod/turf to match sod type used as part of the Parking Lot H contract. See ADD3-LS8.
Description B: Star jasmine removed from rock mulch areas, quantity updated; Star jasmine in planter replaced with hemerocallis; Carex key id revised to match Legend as shown on ADD3-LS9.

CIVIL DRAWINGS (C - SERIES)

Item No. D-7

Reference: Drawing C-603
Description A: Revise Note on Detail 30 as shown on ADD3-C1.

LANDSCAPE DRAWINGS (LC - SERIES)

Item No. D-8

Reference: Drawing LC-106, LC-107, LC-108
Description A: At Legend/LC-106, LC-107 and LC-108 **Change** reference reading 6/LS-106 at concrete sidewalk to 5/LS-106.

ARCHITECTURAL DRAWINGS (A - SERIES)

Item No. D-9

Reference: Drawing A-101A & A-101B
Description A: **Revise** the scale at bottom right of the site plans shown on A-101A and A-101B from 1"=30' to 1"=20'.

STRUCTURAL DRAWINGS (S - SERIES)

Item No. D-10

Reference: Drawing S-601
Description A: At 13/S-601 **Delete** shearwall type 44 and type 66.

Item No. D-11

Reference: Drawing S-302
Description A: At 3/S-302 **Change** shearwall type 44 to shearwall type 2.

Item No. D-12

Reference: Drawing S-123 & S-124
Description A: At 1/S-123 & 1/S-124 **Change** references reading 1/S-502 to 8/S-501.

Item No. D-13

Reference: Drawing S-501
Description A: At 8/S-502 **Change** references reading 8/S-502 to 8/S-501.

ELECTRICAL DRAWINGS (E - SERIES)

Item No. D-14

Reference: Drawing E-102 Partial Site Lighting and Miscellaneous Plan
Description A: Revise note #20 to read: "LIFT STATION WITH TWO ½ HP 230 VOLT SINGLE PHASE MOTORS TO BE PROVIDED BY CIVIL CONTRACTOR. SEE CIVIL FOR EXACT LOCATION. SEE ELECTRICAL DRAWING E-122PL FOR OTHER INFORMATION."

Item No. D-15

Reference: Drawing E-123PL
Description A: In Classrooms 207, 208 and 210, the lighting switches a and b shall be single-pole switches in lieu of 3-ways switches.

AUDIOVISUAL DRAWINGS (TAE & TA - SERIES)

Item No. D-16

Reference: Drawing TAE-0.1
Description A: Delete TA7.1 from Sheet Index on 1/TAE-0.1.

Item No. D-17

Reference: Drawing TAE-7.1
Description A: Revise loud speaker type on 5/TAE-7.1 to JBL Control 24CT.

ANSWERS TO RFI'S

Item No. RFI-1

Question: Ref Sheet No.: S-701 & S-702
Please provide elevations on top of the footing and on top of the retaining wall shown on S-701 and S-702.
Answer: Top of footing elevations should be determined by subtracting the top of grade to top of footing dimensions noted on the sections from the grade elevations noted on the civil drawings.

Item No. RFI-2

Question: Ref Sheet No.: LC-114
Regarding the EPDM wear surface shown on page LC-114, please specify a product or manufacturer. There is no spec for this product.
Answer: The EPDM is specified in 02735, 2.1.B

Item No. RFI-3

Question: Ref Spec: Section 08800 - Glazing
Regarding observation window glass; spec Section 08800, page 7, Section 2.2-E, note 3: need information on Owner's graphic on interlayer.

Answer: Delete requirement for Owner's graphic on interlayer.

Item No. RFI-4

Question:

Ref Spec: Section 02870 - OLE Site Furnishings

Per spec Section 02870, page 6, Section 2.7: Plexiglass Art Panels, art panels are to be furnished & installed by Contractor. Is there a specified manufacturer? If so, please specify or recommend manufacturers.

Answer:

See Detail 4/LC-118 for the plexiglass art panels. The Contractor is to fabricate them from plexiglass sheet to comply with the details as shown; they are not a pre-manufactured item.

Item No. RFI-5

Question:

Ref Sheet No.: E-123PL

In Toddler Classrooms 207, 208 & 210 (2) 3-way switches are shown near the entrances to the Observation Rooms to control switch legs "a" and "b" in each room. The second set of corresponding 3-way switches is not shown in any of these rooms. Please confirm or clarify that these should be single-pole switches and not 3-ways switches.

Answer:

No 3-way switches are required in Classrooms 207, 208 and 210.

Item No. RFI-6

Question:

Ref Sheet No.: Regarding the dual shades (Mecho)

Is room darkening side and sill channel required on any of the locations for them.

Answer:

No side and sill channels are required.

Item No. RFI-7

Question:

Ref Sheet No.: 4/S-701

Why is the front wall shown much lower than the back wall? Per detail 16/S-702, the front wall is only 6" lower.

Answer:

Bidders should not be scaling the structural drawings for wall height. Top of wall elevations are specified on the civil drawings.

Item No. RFI-8

Question:

Ref Sheet No.: A-753

According to sheet A-753-Detail C5, 1-way glass is to be installed at the observation window. Is there to be 1-way glass in all observation windows?

Answer:

All Observation Room windows shall have 1-way glass.

Item No. RFI-9

Question:

Ref Sheet No.: A121, A303, and A354

The wall section for building B and C show the retaining wall has sheet waterproofing w/ protection panels. Should the sheet waterproofing and protection panels be applied to the entire retaining wall, or is this only where it is near the building?

Answer: Provide sheet waterproofing and protection drainage panels as specified in "Section 07131 - Self-Adhering Sheet Waterproofing" at retaining walls and planters walls located between northwest corner of Toddler Building and northeast corner of Preschool Building. Provide cold-applied, emulsified- asphalt dampproofing and protection drainage panels at all other retaining walls and planter interiors as specified in "Section 07115 - Bituminous Dampproofing".

Item No. RFI-10

Question:

Ref Sheet No.: LS104.1

Will the bike racks on sheet LS104.1 be added to spec section 02700 - Site Furnishings?

Answer:

Yes. See Item No. PM2-3 above.

Item No. RFI-11

Question:

Ref Spec: Section 03300 - Cast-In-Place Concrete

The 03300 spec section calls out two different aggregates. Page 5 calls out for a Pea Gravel type of material. Page 12 calls out for Drain Rock type of material. Please clarify which aggregate base is required under the interior slabs on grade?

Answer:

We believe the two paragraphs are consistent base below interior slabs-on-grade should comply with the Cal Trans spec.

Item No. RFI-12

Question:

Ref Sheet No.: 5/LS-106

Details on LS-106, the note #3 said concrete finish as shown on L2.0. Where is L2.0?

Answer:

Note #3 should reference materials legend on LS-101 for concrete finish.

Item No. RFI-13

Question:

Ref Sheet No.: 13/S-601

The schedule shows sill connection nailing. Is there sill connection nailing on this project? What detail shows the location of the sill connections? The schedule shows 44, 66 type shear wall. Are there these wall on the project?

Answer:

Please refer to 15/S-601 for reference to connection nailing. There are no 44 or 66 shear wall types.

Item No. RFI-14

Question:

Ref Sheet No.: A-101A

Drawing scale should be 1"=20'-0" (I think).

Answer:

The site plans shown on A-101A and A-101B are at 1"=20' scale.

Item No. RFI-15

Question:

Ref Sheet No.: LC-106, LC-107, LC-108

On plan pages LC-106, LC-107 and LC-108, the first legend calls out for concrete sidewalks. But the legend also directs me to detail 6/LS-106

which is a detail for natural resin paving. Are the walks concrete or resin paving?
Answer: Revise 6/LS-106 to 5/LS-106 concrete paving.

Item No. RFI-16

Question:

Ref Spec: Section 03200 and 03300

Sections 03200 & 03300 both require the contractor to hire an independent testing agency. Please confirm if this is truly required since the owner is already hiring a testing agency.

Answer:

A Contractor's Testing Agency is required only for the tasks specified in the documents. Their scope is not redundant with the Owner's Testing Agency.

Item No. RFI-17

Question:

Ref Sheet No.: Addendum 1

In Addendum No. 1, Item #PM1-2, Section 01230 - Alternates were added to this project. Will there be a new bid form?

Answer:

Bid form was revised and reissued as part of Addendum 2.

Item No. RFI-18

Question:

Ref Sheet No.: S-122 - 4

There are references on these sheets to sheet S-502. No such sheet is in the set of drawings and sheet S-502 is not noted in the drawing index. Clarify.

Answer:

All reference reading 1/S-502 should be revised to 8/S-501.

Item No. RFI-19

Question:

Ref Sheet No.: LC-113

On sheet LC-113 the plant legend for play areas has no on center spacing for the ground covers or plant sizes for the trees and shrubs. Please advise.

Answer:

This question was answered in Addendum 2.

Item No. RFI-20

Question:

Ref Sheet No.: LS-104.1

On the call out for the rock mulch it refers to detail 4/LS-106. Should that refer to detail 3/LS-106?

Answer:

Yes, please refer to 3/LS-106 for rock mulch.

Item No. RFI-21

Question:

Ref Sheet No.: Addendum 2 Item No. D-4

Addendum 2 Item D-4 states to replace the plant list shown on LC-113 with plant list shown on ADD2-LC1. I could not find this document in Addendum 2 that was posted on your website. Was it accidentally left out?

Answer:

Revised Plant List was included as part of Addendum 2.

Item No. RFI-22

Question:

Ref Sheet No.: S-302

The east wall for the Toddler building (Sheet S-123) shows Type 2 shear walls. The elevation for the east wall (Sheet S-302) shows type 44 shear walls. Please Clarify.

Answer:

Use Type 2 shear walls.

Item No. RFI-23

Question:

Ref Sheet No.: A-355

Plans call for 1x6 T&G wood siding on the wood furring. What is the size and o.c. spacing for the furring? Since the furring appears to install over the building paper, what grade of material should be used?

Answer:

See Item No. PM2-5 above.

Item No. RFI-24

Question:

Ref Spec: Section 06402 - Interior Architectural Woodwork

Specification Section 06402 references both plastic laminate and wood veneer cabinets. The Plans do not say which cabinets are plastic laminate and which are wood veneer. Please clarify.

Answer:

See Item No. PM2-6 above.

Item No. RFI-25

Question:

Ref Sheet No.: A-112

What kind of wood to be used. The only note I saw was 1"x6" and 2"x6" for the top cap.

Answer:

See spec Section 06201- Exterior & Interior Finish Carpentry: Article 2.2.

Item No. RFI-26

Question:

Ref Sheet No.: LC-118

We would like to know if the Architect has suggested a vendor for the vinyl coated 14 gauge 2"x2" black wire mesh? We are having a tough time tracking it down. Also, 14 gauge 2" wire mesh seems to be very light for the application needed at a child care facility.

Answer:

14-gauge wire mesh with a 2-inch opening is appropriate for a children's environment, especially in this application for 2-to 3-year-old children.

12-gauge 2-inch x 2-inch wire mesh is also available on the market; however, and the following are acceptable alternate products:

1. Riverdale Vinyl-Gard 2-inch x 1-inch x 14-gauge by Klubertanz.
2. Shepherd Vinyl-Coated Wire 2-inch x 2-inch x 12-gauge by Klubertanz.
3. 1-inch x 2-inch, 14-gauge black vinyl coated welded-wire mesh by Jackson Wire and Academy Fence.

END OF ADDENDUM ITEMS

ATTACHMENTS

PROJECT MANUAL

Volume 2: Section 02300 - Earthwork and Grading
 Section 02315 - Trenching, Backfilling, and Compacting

DRAWINGS

ADD3-C1	(print on 11" x17")
ADD3-LS1 through LS6	(print on 8 ½"x11")
ADD3-LS7 & LS8	(print on 11" x17")
ADD3-LS9	(print on 8 ½"x11")

ISSUED BY: Long Vo

Beverly Prior Architects
Firm

Steve Parker
Architect

Signature

DSA Submittal and Approval Required
COPIES TO: Victoria Lamica, CLPCCD
 Kim Mellecker, CM



SECTION 02300 - EARTHWORK AND GRADING

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Documents:
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. This section describes general requirements, products, and methods of execution relating to on-site earthwork. Any work within the public right-of-way shall be constructed to the standards of the City of Livermore, or State of California Department of Transportation (CDT), as applicable. Earthwork includes, but is not limited to, the following:
 - 1. Grading.
 - 2. Material.
 - 3. Excavation.
 - 4. Filling and backfilling.
 - 5. Soil Sterilant.
 - 6. Termiticide.
- C. Provide labor, material and equipment and services necessary to complete the excavations, re-compaction and finish grading as specified and indicated on Drawings.
 - 1. Obtain permit from local authorities.
 - 2. Provide surveying for grading operations.
 - 3. Provide shoring design.
 - 4. Provide dewatering operations.
 - 5. Provide site grading, cut, fill and finish.
 - 6. Provide excavation and backfill for filling construction, including trenches within building lines.
 - 7. Preparation of subgrade for building slabs, walks, pavements, and landscaping.
 - 8. Provide distribution of stockpiled topsoil.
 - 9. Provide sub-base course for walks and pavements.
 - 10. Provide sand and gravel for capillary break/moisture barrier under building slabs.
 - 11. Provide sub-surface drainage backfill for walls and trenches.
 - 12. Provide engineered fills for building slabs and foundations.
- C. The work includes removal and legal disposal off the site of debris, rubbish and other materials resulting from clearing and grubbing operations.
- D. Work specified in Related Sections:
 - 1. SECTION 02200 – SITE PREPARATION.
 - 2. SECTION 02315 – TRENCHING, BACKFILLING, & COMPACTING.

1.2 DEFINITIONS

- A. Engineered Fill:
 - 1. Soil or soil-rock material approved by Owner's Representative and transported to the site by the Contractor in order to raise grades or to backfill excavations.
 - 2. The Owner's Testing Agency will make sufficient tests and/or observations prior to importing material for the purpose of issuing a written statement that the proposed import material meets the specified requirements.
- B. On-site Material: Soil or earth material obtained from required on-site excavation.

- C. Excavation: Consists of the removal of material encountered to subgrade elevations and the re-use or disposal of materials removed.
- D. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below sub-base, drainage fill, or topsoil materials.
- E. Borrow: Soil material obtained offsite when sufficient approved soil material is not available from onsite excavations.
- F. Base Course: The layer placed between the sub-base and surface pavement in a paving system.
- G. Relative Compaction: In-place dry density of soil expressed as percentage of maximum dry density of same materials, as determined by laboratory test procedure American Society for Testing and Materials (ASTM) D1557.

1.3 SYSTEM DESCRIPTION

- A. Requirements:
 - 1. Grades and elevations are to be established with reference to bench marks referenced on Drawings.
 - 2. Maintain engineering markers such as monuments, bench marks and location stakes. If disturbed or destroyed, replace.
- B. Criteria:
 - 1. The character of the material to be excavated or used for subgrade is not necessarily as indicated.
 - 2. Ground water elevations indicated are those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.
 - 3. Blasting will not be permitted. Remove material in an approved manner.
- C. Shoring Design: Where shoring is required by State Law or determined by the Contractor to be necessary, provide proposed excavation shoring method for review prior to commencement of excavation requiring shoring. Include the following information:
 - 1. Basic design assumptions.
 - 2. Design Calculations.
 - 3. Describe materials or shoring system to be used.
 - 4. Indicate whether or not any components will remain after filling or backfilling.
 - 5. The shop drawings for the proposed shoring system.
 - 6. Coordinate with the Construction Documents and identify any proposed modifications or deviations.
 - 7. Certification of the above by a registered professional civil or structural engineer licensed by the State of California.
- D. Dewatering Plan: Based upon site surface and subsurface conditions, including available geotechnical and hydrological data, provide a system to perform the following:
 - 1. Lower the ground water level below bottom of excavation.
 - 2. Relieve the hydrostatic pressure below the subgrade to prevent uplift.
 - 3. Prevent surface drainage from accumulating within work area.
 - 4. Legally discharge and dispose of excess water.
 - 5. Submit description of basic components of proposed dewatering system and its planned method of operation.

1.4 SUBMITTALS

- A. Comply with provisions of Division 1 Section "Submittal Procedures".
- B. Product Data: Manufacturer's literature and data, including, where applicable, capacity, labels, or other markings on equipment made to the specified standards for materials, for the following:
 - 1. Imported materials.
 - 2. Class II aggregate base (CDT Section 26).
 - 3. Storm Water Pollution Prevention/Erosion Control Plans.
 - 4. Permit/Notice of Intent (N.O.I.), for discharge of storm run-off from the construction site.
 - 5. Soil Sterilant.
 - 6. Termiticide.
- C. Test Reports: Submit following reports for import material directly to Owner's Representative from the Contractor's testing services:
 - 1. Test reports on borrow material.
 - 2. Density test reports.
 - 3. One optimum moisture-maximum density curve for each type of soil encountered.
 - 4. Report of actual unconfined compressive strength and/or results of bearing test of each strata tested.
 - 5. At least one laboratory optimum moisture - maximum dry density curve for each type of soil encountered.
- D. Shoring Design: Submit 4 copies of shoring design and shop drawings; none will be returned unless a concern is observed.
- E. Submit description of dewatering methods proposed for use.
- F. Submit description of vibratory compactors proposed for use when requesting placement of backfill and fill materials.
- G. Samples:
 - 1. 40-lb. samples sealed in air-tight containers, of each proposed fill and backfill soil material from on-site or borrow sources.
 - 2. 12-by-12 inch sample of filter fabric.
- H. Pad Certification
 - 1. Submit a pad certification stamped by a California Licensed Land Surveyor.

1.5 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Comply with State of California Business and Transportation Agency, Department of Transportation (CDT, Caltrans) "Standard Specifications."
 - 2. Comply with State of California Code of Regulations (CCR).
 - 3. Comply with State of California Construction Safety Orders, Latest Edition (CAL/OSHA).
 - 4. City of Livermore Department of Public Works, Standards and Specifications and Drawings, latest edition.
- B. Soil Testing:
 - 1. Owner will engage a geotechnical testing agency, to include testing soil materials proposed for use in the work and for quality control testing during excavation and fill operations.
 - 2. Test results will be distributed in compliance with Division 01 Section "Testing & Inspection Services".

- C. Codes and Standards:
1. Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.
 2. Storm Water Pollution Prevention and Monitoring Plan to be prepared by others.
 3. Statewide General Permit to Discharge Storm Water associated with construction activity.
- D. Comply with the latest editions of the following Standards and Regulations:
1. American Society for Testing and Materials (ASTM):
 - a. C33: Concrete Aggregates.
 - b. C125: Standard Terminology Relating to Concrete and Concrete Aggregates.
 - c. C136: Sieve Analysis of Fine and Coarse Aggregates.
 - d. C566: Total Evaporable Moisture Content of Aggregate by Drying.
 - e. D421: Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants.
 - f. D422: Particle Size Analysis of Soil.
 - g. D854: Specific Gravity of Soils.
 - h. D1556: Density of Soil by the Sand Cone Method.
 - i. D1557: Laboratory Compaction Characteristics of Soil Using Modified Effort
 - j. D2216: Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.
 - k. D2487: Classification of Soils for Engineering Purposes.
 - l. D2922: Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
 - m. D3017: Density of Soil in Place by Drive Cylinder Method.
 - n. D3017: Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
 - o. D4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 2. California Administrative Code, Title 24, Part 2 - Basic Building Regulations, Chapter 24 - Excavations, Foundations, and Retaining Walls.
 3. California Department of Transportation (CDT) Standard Specifications:
 - a. Section 17: Watering
 - b. Section 18: Dust Palliative
 - c. Section 19: Earthwork.
 4. CAL/OSHA, Title 8.
 5. City of Livermore Standard Plans and Specifications
 6. Other authorities having jurisdiction
- E. Geotechnical Engineering Services:
1. Geotechnical Engineer will be the Owner's Representative to observe grading operations during preparation of site, excavation, and compaction of fill materials.
 2. Make visits to site to familiarize him generally with progress and quality of work.
 3. Make field observations and tests to enable him to form opinions regarding adequacy of site preparation, acceptability of fill materials and extent to which earthwork construction and relative compaction comply with specifications requirements.
 4. Examine conditions exposed in foundation excavations.
- F. Site Information:
1. Geotechnical Investigation Reports are available for examination by Contractor.
 2. Additional soil borings and other exploratory operations may be made by Contractor at no cost to Owner. Submit proposed boring locations for review prior to performing the work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect materials of this section before, during and after installation; objects designated to be retained; and the installed work of other trades.

- B. In the event of damage to any of these items, immediately make repairs or replacements necessary to the acceptance of the Owner's Representative and at no additional cost to the Owner.
- C. Comply with provisions of Division 01 Section "Temporary Facilities" where necessary to control dust and noise on and near the work caused by operations during performance of the Work.

1.7 PROJECT CONDITIONS

- A. Site Information: Review the project geotechnical reports and supplemental recommendations.
- B. Environmental Requirements:
 - 1. When unfavorable weather conditions necessitate interrupting filling and grading operations, prepare areas by compaction of surface and grading to avoid collection of water.
 - 2. Provide adequate temporary drainage to prevent erosion.
 - 3. After interruption, reestablish compaction specified in last layer before resuming work.
 - 4. Protect existing storm drainage system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to Owner.
 - 5. Protect existing streams, ditches and storm drain inlets from water-borne soil by means of straw bale dikes, filter fiber dams, or other methods as approved by the Owner's Representative.
- C. Barricade open excavations and post with warning lights.
 - 1. Comply with requirements of SECTION 01500 - TEMPORARY FACILITIES.
 - 2. Operate warning lights as recommended by authorities having jurisdiction.
 - 3. Protect structures, utilities, sidewalks, pavements, and other facilities immediately adjacent to excavations, from damages caused by settlement, lateral movement, undermining, washout and other hazards.
- D. Protection of Subgrade: Do not allow equipment to pump or rut subgrade, stripped areas, footing excavations, or other areas prepared for project.
- E. At Contractor's option, a working pad of granular material may be laid to protect footing and floor subgrade soils from disruption by traffic during wet conditions.
- D. Transport all excess soils materials by legally approved methods to disposal areas.
 - 1. Coordinate with the Owner's Representative.
 - 2. Sufficient topsoil and fill material shall be retained from the site to complete project requirements.
 - 3. Any additional topsoil and fill requirements shall be the responsibility of the Contractor.
- G. Use of explosives will not be permitted.
- H. Dust Control Requirements: At all times during earthwork operations and until final completion and acceptance of the earthwork, the Contractor shall prevent the formation of an airborne dust and dirt nuisance from interfering with the surrounding normal operations. The Contractor shall effectively stabilize the site of work in such a manner that it will confine dust particles to the immediate surface of the work and to obtain a minimum of 40 percent emissions reduction by applying a dust palliative. The dust palliative shall be non-petroleum based. Water alone is not considered to be a dust palliative. The dust palliative shall be applied at the rate and method in conformance with Section 18, "Dust Palliative," of the CDT Standard Specifications and as recommended and/or specified by the manufacturer. Contractor shall assume liability for all claims related to dust and dirt nuisances.

1.8 EXISTING UTILITIES

- A. The Owner's Representative will contact campus Facilities and local utility agencies prior to construction and arrange for the shut-off of all utilities serving the buildings to be demolished. Coordinate work required to abandon active lines with the Owner's Representative and the owners of utility.
- B. Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during excavation operations.
- C. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult utility Owner immediately for directions.
 - 1. Cooperate with the Owner and public and private utility companies in keeping their respective services and facilities in operation.
 - 2. Repair damaged utilities to the satisfaction of the utility owner.
- D. Do not interrupt existing utilities serving facilities occupied and used by the Owner or others, except when permitted in writing by Owner's Representative and then only after acceptable temporary utility services have been provided.

1.9 SEQUENCING AND SCHEDULING

- A. The sequence of operations shall be reviewed by the Owner's Representative prior to commencement of any work.
- B. Coordinate operations with relocation of existing utilities.

PART 2 - PRODUCTS

2.1 MATERIALS:

- A. General:
 - 1. Fill material will be subject to approval of the Geotechnical Engineer.
 - 2. For approval of imported fill material, notify the Owner's Representative at least 7 days in advance of intention to import material, designate proposed borrow area, and permit the Geotechnical Engineer to sample as necessary from borrow area for purpose of making acceptance tests to prove quality of material.
 - 3. The Geotechnical Engineer's report on acceptability shall be final and binding.
 - 4. During grading operations, soil types other than those analyzed in the geotechnical report for the project, may be encountered.
 - 5. Consult the Geotechnical Engineer to determine the suitability of these soils.
- B. Select Structural Fill below footings and slabs behind retaining walls
 - 1. Imported fill with Plasticity Index 10 or less, and 30 percent (by mass) or less shall pass the No. 200 sieve. Fill should be free of rocks or lumps in excess of 6-inches in diameter, trash, debris, roots, vegetation, or other deleterious material, tested or documented to be non-corrosive per Caltrans Corrosion Guidelines version 1.0. Or,
 - 2. On-Site borrow (treated with lime) with Plasticity Index of 10 or less. Consult the Geotechnical Engineer to determine the suitability of these soils.
 - 3. Fill shall be thoroughly compactable without excessive voids.
- C. General Fill for uses not otherwise specified shall be imported or on-site borrow, free of rocks or lumps in excess of 6-inches in diameter, trash, debris, roots, vegetation or other deleterious material.

- D. Aggregate Base for pavements shall be imported, meeting the requirements for Class II Aggregate Base per Caltrans Section 26.
- E. Permeable Aggregate for retaining wall back drain shall be imported, open-graded, clean, compactable crushed rock or angular gravel, nominal size 3/4-inch or less.
- F. Geofabric shall be imported, non-woven filter fabric, Mirafi 140N, or approved equivalent.
- G. Capillary Break Gravel part of vapor retarding system below slabs-on-grade shall be imported, open-graded, clean, compactable crushed rock or angular gravel, nominal size 3/4-inch or less.
- H. Vapor Retarding Membrane shall be imported, 15-mil, Class A plastic membrane per ASTM E1745.
- I. Pipe/Conduit Bedding Material shall be imported, see SECTION 02315 Trenching, Backfilling, and Compacting for additional information.
 - 1. 90-100 percent (by mass) shall pass No. 4 Sieve, and
 - 2. 5 percent or less should pass the No. 200 sieve.
- J. Trench Backfill above bedding material shall be imported or on-site borrow meeting the following requirements:
 - 1. Free from rocks or lumps in excess of 4-inches in diameter, and
 - 2. Free from rocks or lumps in excess of 2-inches in diameter in the top 12-inches.
- K. Sand: Clean, well-graded fine to coarse sand with not more than 2 percent passing the #200 sieve based on wet sieve analysis.
 - 1. Provide layer at least two feet wide (thick) against embedded walls.
 - 2. Provide at other locations indicated.
 - 3. Where coarse sand is required, provide sand no finer than No. 40 sieve.
- L. Topsoil: Friable clay loam surface soil found in a depth of not less than 10 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones and other objects over 2 inches in diameter, and without weeds, roots and other objectionable material.
 - 1. Use topsoil for top 2 feet of fill against exterior walls, except at paving and sidewalks.
 - 2. Topsoil may also be used beyond the area within 5 feet of building, except under paving and sidewalks.
 - 3. Confirm suitability of stockpiled materials.
- M. Imported Fill for Planting Areas: Imported fill for use in planting areas shall be sandy loam weed free soil. Submit analysis from certified Soil and Plant Lab. Coordinate with Landscape Architect.
- N. Pea Gravel: 3/8 inch to 1/2 inch washed, uncrushed gravel. Use at drainage pipe and at other locations indicated.
- O. Filter Fabric: Provide filter fabrics that meet or exceed the listed minimum physical properties determined according to ASTM D4759 and the referenced standard test method in parentheses.
 - 1. Grab Tensile Strength (ASTM D4632): 100 lb.
 - 2. Apparent Opening Size (ASTM D4751): #100 U.S. Standard sieve.
 - 3. Permeability (ASTM D4491): 150 gallons per minute per square foot.

- P. Drainage Pipe:
 - 1. Perforated corrugated plastic drainage tubing meeting ASTM F405, with continuous integral nylon filter screen.
 - 2. Acceptable Manufacturers and Products: Advanced Drainage Systems "DrainGuard," Hancor "Agri-Flow."
 - 3. Provide couplings, elbows and other fittings as recommended by pipe manufacturer.
- Q. Water: Clean and free from deleterious amounts of acids, alkalis, salts and organic matter.

2.2 SOIL STERILANT

- A. Soil Sterilant shall be Treflan E.C. or equal.

2.3 TERMITICIDE

- A. Termiticide shall be Permethrin, Denon, or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. Prior to commencement of earthwork, become thoroughly familiar with site conditions.
- B. In event discrepancies are found, immediately notify the Owner's Representative in writing, indicating the nature and extent of differing conditions.
- C. No earthwork shall be performed without physical presence or acceptance of the Geotechnical Engineer.
- D. The Geotechnical Engineer's acceptance is required by these specifications; notify the Owner's Representative at least 48 hours prior to commencing any phase of earthwork.
 - 1. No phase of work shall proceed until prior phase has been accepted by the Geotechnical Engineer.
 - 2. Work shall not be covered up or continued until acceptance of the Geotechnical Engineer shall give written notice of conformance with the specifications upon completion of grading.
- E. Compacting:
 - 1. Compact by power tamping, rolling or combinations thereof as accepted by the Geotechnical Engineer.
 - a. Where impractical to use rollers in close proximity to walls, stairs, etc., compact by mechanical tamping.
 - b. Scarify and re-compact any layer not attaining compaction until required density is obtained.
 - 2. Compaction by flooding, ponding or jetting will not be permitted.
- F. Hazardous Materials
 - 1. If any materials are encountered that may be hazardous (as defined in Section 25117 of the California Health and Safety Code), inform the Owner's Representative verbally within 24 hours and in writing within 2 business days. Upon discovery, material is to remain undisturbed until investigation by State's representative is complete. The removal and disposal of hazardous materials, if discovered, is not part of the scope of work of this Division for this project.

- G. Excavations, including footing and trench excavations, shall be stabilized in accordance with the Excavation Rules and Regulations stipulated by the Occupational Safety and Health Administration. Stabilization shall consist of shoring sidewalls or laying slopes backward per OSHA regulations.

3.2 SITE PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities which are to remain from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations. Set up tree protection measures prior to commencing grading or demolition operations.
- B. Clearing and Grubbing:
1. Remove from area of designated project earthwork all improvements and obstructions, including designated concrete curbs or slabs, asphaltic concrete, all tree and shrub roots, any buried utility and irrigation lines, and other matter determined by the Geotechnical Engineer to be deleterious.
 - a. In all new planting areas, remove existing base material.
 - b. Use only hand methods for grubbing inside the drip line of trees indicated to be left standing.
 2. Remove from the site all trees and shrubs, unless otherwise indicated on the drawings as existing trees to be left standing.
 3. Remove or fill existing basements left from removed structures as appropriate to areas. Compact in accordance with requirements of these specifications.
 4. Removed material shall become property of the Contractor and shall be removed from site, unless otherwise indicated on the drawings or specified herein.
 5. Holes resulting from removal of underground obstructions that extend below finish grades shall be cleared and backfilled with engineered fill.
 6. Existing Trees to remain:
 - a. Verify the locations of existing trees to be preserved.
 - b. Replace existing trees to remain that are damaged during construction at no additional cost to the Owner.
 - c. Carefully make clean cuts at roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction. Paint cuts over ½ inch in size with tree pruning compound.
- D. Topsoil:
1. Strip topsoil to whatever depths encountered in manner to prevent intermingling with the underlying subsoil or other objectionable material.
 2. Remove heavy growths of grass from areas before stripping. Where trees are indicated to be left standing, stop topsoil stripping a sufficient distance to prevent damage to the main root system.
 3. Stockpile topsoil in storage piles to freely drain surface water.
 4. Cover storage piles if required to prevent windblown dust.

3.3 EXISTING UTILITIES

- A. Protect existing utilities that are to remain in operation as specified.
- B. Demolish and completely remove from the site existing underground utilities indicated to be removed.
- C. Movement of construction machinery and equipment over existing pipes and utilities during construction shall be at Contractor's risk.

- D. Excavation made with power-driven equipment is not permitted within 2 feet of any known utility or subsurface structure.
1. Use hand or light equipment for excavating immediately adjacent to or for excavations exposing a utility or buried structure.
 2. Start hand or light equipment excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured.
 3. Support uncovered lines or other existing work affected by excavation until approval for backfill is obtained.
 4. Report damage of utility line or subsurface structures immediately to Owner's Representative

3.4 PREPARATION OF SUBGRADE:

- A. Expansive soils are anticipated. To help mitigate expansive soil problems, expansive soils shall be over-excavated and removed.
1. Geotechnical Engineer shall review the necessity for and extent of over-excavation of expansive soils once excavation begins.
 2. Over-excavate and remove expansive soils from below structures, including masonry block screening and trash enclosure walls to 3 feet below foundation slabs. Depth of removal shall be measured from the bottom of slabs, excluding thickened edges.
 3. Over-excavate and remove the expansive soils below exterior flatwork to 2 feet below slabs. Depth of removal shall be measured from the bottom of slabs, excluding thickened edges.
 4. Removals shall extend a distance beyond the perimeter of the slabs and footings equivalent to the depth of removal below the bearing surface. Removals shall extend to 3 feet outside the building footprint plus the depth of removal below the foundation element.
- B. Prepared subgrade below slabs, walkways, and fill shall be maintained in a moist (but not saturated) condition by the periodic sprinkling of water prior to placement of additional overlying fill or construction of footings and slabs. Subgrade that has been permitted to dry out and loosen or develop desiccation cracking, shall be scarified, moisture conditions, and re-compacted per the requirements below:
1. Below slabs, walkways, or footings bearing on select fill or lime-treated soil, do not scarify. Below footings and slabs, compact to 95 percent relative compaction at or near optimum moisture content, in accordance with ASTM D1557 typical.
 2. Behind retaining walls, compact to 90 percent relative compaction at or near optimum moisture content.
 3. In utility trenches, do not scarify. Material below conduit inverts to 12-inches above conduit shall be compacted to 90 percent relative compaction at or near optimum moisture content.
 4. For trench backfill below pavements, walkways or structures, compact to 90 percent relative compaction. The upper 3 feet should be compacted to 95 percent relative compaction.
 5. For trench backfill in other locations, compact to 90 percent relative compaction.
 6. Below fill and footings, bearing on untreated native soil, remove unsuitable materials as specified above, and scarify the upper 8-inches then compact to 90 percent relative compaction to 3 percent or more above optimum moisture content. Compact the upper 6 inches of pavement subgrade to 95 percent relative compaction. Keep in a moist condition by sprinkling water.
 7. For Aggregate Base, compact to 95 percent relative compaction at or near optimum moisture content.
 8. For Asphalt Concrete, compact to 95 percent relative compaction.
 9. For General Fill in locations not already specified, compact to 90 percent relative compaction at or near optimum moisture content.

- C. Compact in fill in horizontal lifts. The allowable un-compacted thickness of each lift of fill shall depend on the type of compaction equipment utilized, but generally shall not exceed 8-inches in loose thickness. Heavy compaction equipment shall not be used in the zone of influence behind retaining walls. The zone of influence is the region above a plane extending up and away from the heel of the wall at a slope of approximately 1H:1V.

3.5 DEWATERING

- A. Do not allow water from surface drainage or underground sources to accumulate in excavations, unfinished fills, or other low areas.
- B. Provide and maintain ample means and devices to remove water promptly and dispose properly of water entering excavations or other parts of the work to prevent softening of exposed surfaces.
- C. Dewater by methods which will ensure dry excavation and preservation of finish lines and grades of excavation bottoms.
- D. Prior to excavating below ground water level, place dewatering system in operation.
 - 1. Lower the ground water level a minimum of 1 foot below the bottom of the excavation.
 - 2. Relieve the hydrostatic pressure in pervious zones below the subgrade elevation to prevent uplift.
 - 3. Use screens and gravel packs as necessary to prevent removal of fines from the soil.
- E. Operate the dewatering system continuously, 24 hours a day, 7 days a week until construction work below existing ground water level is completed.
 - 1. Measure and record the performance of the dewatering system.
 - a. Perform at the same time each day.
 - b. Use piezometers and observation wells.
 - 2. After placement of initial slabs and backfill, the ground water level may be allowed to rise.
 - 3. At no time allow ground water to rise higher than 1 foot below the prevailing level of excavation or backfill.
 - 4. Have a back-up pump and system available for immediate use.
- F. Dispose of water away from the work in suitable manner without damage to adjacent property or menace to public health.
- G. Do not drain water into work being built or under construction without prior acceptance of the Owner's Representative.
- H. Protect existing storm drainage system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to the Owner.

3.6 SITE EXCAVATION

- A. General
 - 1. All supports, shoring, and sheet piling required for the sides of excavations or for protection of adjacent existing improvements shall be provided and maintained by the Contractor. The adequacy of such systems shall be the complete responsibility of the Contractor.
 - 2. Earth and rock, regardless of character and subsurface conditions, shall be excavated to depths shown on drawings and to the neat dimensions of the footings wherever practicable, to permit pouring of footings and grade beams without use of side forms, except at slab perimeters.

3. Large rocks, pieces of concrete or other obstructions, if encountered during the excavation/scarifying operations, shall be removed and disposed of by the Contractor off the site in a legal manner.
4. Where footing excavation is too deep, backfill shall be concrete, controlled low strength material (CLSM), or compacted fill. Where footings are over dug laterally, side forms shall be employed for backfill with compacted fill, CLSM, rock fill or concrete backfill (Contractor's option).
5. Where forming is required, only that excavation necessary to permit placing and removal of forms shall be done.
6. Bottoms of all footings and foundations trenches shall be subject to testing by the Geotechnical Engineer. Corrective measures as directed by the Owner's Representative shall be executed promptly.

B. Excavate subgrade as required to allow for finish grades shown on drawings, as required for structural fill or otherwise required for proper completion of the work.

C. Remove and replace subgrade materials designated by Geotechnical Engineer as unsuitable.

3.7 FILL AND COMPACTING

A. See SECTION 02315 - TRENCHING, BACKFILLING, & COMPACTING for fill and compacting requirements.

3.8 MOISTURE CONTROL

A. Do not place, spread or roll fill material during unfavorable weather conditions or when fill material is excessively wet.

B. Do not resume operations until moisture content and fill density are satisfactory to the Geotechnical Engineer.

C. Provide berms or channels to prevent surface water from flooding excavations. Promptly remove water collecting in depressions.

D. Where soil has been softened or eroded by flooding or by placement during unfavorable weather, remove damaged areas and re-compact as described for fill and compaction.

F. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material.

1. Prevent free water appearing on surface during or subsequent to compaction operation.

2. Remove and replace, or scarify and air dry, soil material too wet to permit compaction to specified density.

3. Soil material removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing or pulverizing until moisture content is reduced to a satisfactory value.

3.9 GRADING

A. General: Uniformly grade areas of work including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

1. All areas covered by the project, including excavated and filled areas and adjacent transition areas, shall be uniformly graded so that finished surfaces are at the elevations established by the plans. Planter areas to receive future topsoil shall be graded below finished grade to allow for such material.

2. Finished surfaces and surfaces to receive paving and aggregate base shall be smooth, compacted, and free from irregular surface drainage.
 3. Ditches, gutters, and swales shall be finished to permit proper surface drainage.
 4. All surface areas, except paved and sloped embankments exceeding 8:1, shall be hydroseeded in accordance with specifications in Landscaping Sections.
- B. Grading Tolerances:
1. Excavations shall not exceed 0.10-foot variation from dimensions and elevations shown or noted, unless otherwise approved by Owner's Representative.
 2. Fill and backfill shall be placed with tolerance of plus or minus 0.10 foot if placed in layers.
 3. Grading shall be done within plus or minus 0.10 foot typically; areas under slabs, walks or pavements shall be graded within tolerance of 0 to 0.10 foot.
 4. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.
 5. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10 foot above or below required subgrade elevation.
 6. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than ½ inch above or below required subgrade elevation.
- C. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.10 SOIL STERILIZATION

- A. General: Soil sterilant shall be applied to prepared subgrade or after installation of rock or aggregate base as recommended by the manufacturer. Sterilant shall be applied uniformly at the rate recommended by the manufacturer to all areas beneath asphalt concrete pavement, brick pavement, concrete pavement, or on-grade concrete slabs including sidewalks, curbs, and gutters and areas between the inner and outer security fences. In addition to ground areas treated, sterilant shall be applied below expansion or control joints, and at all areas where pipe, ducts, or other features penetrate slabs.

3.11 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Removal of Excess Excavated Material: Excess material shall be removed by the Contractor off the site in a legal manner.
- B. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.
1. Perform field in-place density tests according to ASTM D1556 (sand cone method), ASTM D2922, ASTM D2167 (Rubber Balloon Method), or ASTM D2937 (Drive Cylinder Method), as applicable.
 - a. Field in-place density tests may also be performed by the nuclear method according to ASTM D6938, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D1556. With each density calibration check, check the calibration curves furnished with the moisture gauges according to ASTM D6938.
 - b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gauges at beginning of work on each different type of material encountered, and at intervals as directed by the Owner's Representative.

2. Footing Subgrade: At footing subgrades, perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verifications and approval of other footing subgrades may be based on a visual comparison of each subgrade with related tested strata when acceptable to the Owner's Representative.
 3. Paved and Building Slab Areas; At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2,000 square feet or less of paved area or building slab, but in no case fewer than three tests.
 4. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in-place density test for each 100 feet or less of wall length, but no fewer than two tests along a wall face.
 5. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 150 feet or less of trench, but not fewer than two tests.
- C. Number and location of tests described above, as well as additional testing, shall be at option of the Geotechnical Engineer.
- D. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, re-compact and retest until required density is obtained.
- E. After grading is completed and the testing agency has completed observation of the work, permit no further excavation or filling, except as approved by Owner's Representative.

3.12 PROTECTION

- A. Protect newly graded areas from traffic and erosion. Install erosion control mat and straw wattles as shown on the plans. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Where completed compacted areas are disturbed by subsequent construction operation or adverse weather, scarify surface, reshape, compact to required density and provide other corrective work, including retesting, prior to further construction.

3.13 CLEAN-UP

- A. Comply with requirements of Section 01710 - CLEANING.

3.14 TERMITICIDE

- A. Termiticide shall be applied to soils as recommended by the manufacturer. Termiticide shall be applied uniformly at the rate recommended by the manufacturer to all areas beneath and around wood frame structures.

END OF SECTION 02300

SECTION 02315 - TRENCHING, BACKFILLING, AND COMPACTING

PART 1 – GENERAL

1.1 SUMMARY

- A. Related Documents:
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Provide labor, material, equipment, and services necessary to complete the backfilling and compacting as necessary for this project. Section includes, but is not limited to:
 - 1. Select Backfill Material.
 - 2. Aggregate Base.
 - 3. Detectable Tape.
 - 4. Trench Excavation.
 - 5. Pipe Bedding.
 - 6. Trench Backfill.
 - 7. Trench Surfacing.
- B. Work specified in Related Sections:
 - 1. SECTION 02300 – EARTHWORK.
 - 2. SECTION 02530 – SANITARY SEWER.
 - 3. SECTION 02630 – STORM DRAINAGE.

1.2 DEFINITIONS

- A. Engineered Fill:
 - 1. Soil or soil-rock material approved by the Geotechnical Engineer and transported to the site by the Contractor in order to raise grades or to backfill excavations.
 - 2. Geotechnical Engineer of Record shall provide sufficient tests, and a written statement that all materials brought onto the project site comply with specification requirements.
- B. Excavation: Consists of the removal of material encountered to subgrade elevations.
- C. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below base.
- D. Base: The layer placed between the subgrade and surface pavement in a paving system.
- E. Relative Compaction: In-place dry density of soil expressed as percentage of maximum dry density of same materials, as determined by laboratory test procedure American Society for Testing and Materials (ASTM) D1557.

1.3 SYSTEM DESCRIPTION

- A. Requirements:
 - 1. Comply with the recommendations of the Geotechnical Engineer.
 - 2. Protect existing trees to remain. No grading is permitted under the drip line of protected trees.
 - 3. Excavations for appurtenant structures, such as, but not limited to, manholes, transition structures, junction structure, vaults, valve boxes, catch basins, thrust blocks, and boring pits, shall be deemed to be in the category of trench excavation.
 - 4. Unless otherwise indicated in the Drawings, all excavation for pipelines shall be open cut.

1.4 SUBMITTALS

- A. Comply with provisions of Division 1 Section "Submittal Procedures".
- B. Submit description of compactors proposed for use when requesting placement of base material.

1.5 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Comply with State of California Business and Transportation Agency, Department of Transportation (Caltrans) latest edition of "Standard Specifications." (CSS).
 - 2. Comply with State of California Code of Regulations (CCR).
 - 3. Comply with State of California Construction Safety Orders, Latest Edition (CAL/OSHA).
- B. Codes and Standards:
 - 1. Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.
 - 2. Storm Water Pollution Prevention Plan to comply with SECTION 01520 – STORM WATER POLLUTION PREVENTION.
 - 3. California Department of Transportation (CDT):
 - a. Section 19: Earthwork.
 - b. Standard Test Methods: No. 202.
 - 4. American Society for Testing and Materials (ASTM):
 - a. D6938: Density of Soil by the Sand Cone Method.
 - b. D1557: Moisture Density Relations of Soils and Soil-Aggregate Mixtures

1.6 DELIVERY, STORAGE AND HANDLING:

- A. Protect materials before, during and after installation.
- B. Comply with provisions of Division 01 Section "Temporary Facilities & Controls" where necessary to control dust and noise on and near the work caused by operations during construction activities.

1.7 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Protect existing storm drainage system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to the Owner.
 - 2. Protect existing streams, ditches and storm drain inlets during work on this project.
- B. Barricade open excavations and post with warning lights.
 - 1. Comply with requirements of Division 01 Section "Temporary Facilities & Controls".
 - 2. Operate warning lights and barricades as required.
 - 3. Protect structures, utilities, sidewalks, pavements, and other facilities immediately adjacent to excavations, from damages caused by settlement, lateral movement, undermining, washout, and other hazards.
- C. Protection of Subgrade: Do not allow equipment to pump or rut subgrade, stripped areas, footing excavations, or other areas prepared for project.
- D. Transport all excess soils materials by legally approved methods to disposal areas.
 - 1. Coordinate with the Owner's Representative.
 - 2. Any additional fill requirements shall be the responsibility of the Contractor.

1.8 EXISTING UTILITIES

- A. Locate existing underground utilities in the areas of work. For utilities that are to remain in place, provide adequate means of protection during excavation operations.
- B. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult utility agency immediately for directions.
 - 1. Cooperate with the Owner's Representative and public and private utility companies in keeping their respective services and facilities in operation.
 - 2. Repair damaged utilities to the satisfaction of the utility owner.
- C. Do not interrupt existing utilities serving facilities occupied and used by the Owner or others, except when permitted in writing by the Owner's Representative and then only after acceptable temporary utility services have been provided.

1.9 SEQUENCING AND SCHEDULING:

- A. The sequence of operations shall be reviewed by the Owner's Representative prior to commencement of any work.

PART 2 – PRODUCTS

2.1 MATERIALS:

- A. General:
 - 1. Import materials will be subject to approval of the Geotechnical Engineer.
 - 2. For approval of imported fill material, notify the Owner's Representative at least 7 days in advance of intention to import material.
- B. Trench Sand:
 - 1. Granular material free from clay, organic materials, and other deleterious substances and conforming to CSS Section 19-3.025 B.
- C. Trench Gravel:
 - 1. Granular material free from clay, organic materials, and other deleterious substances and conforming to Class 1 Type A Permeable Material, per CSS Section 68-1.025.
- D. Approved Native Fill:
 - 1. See SECTION 02300 – EARTHWORK AND GRADING.
- E. Imported Fill:
 - 1. See SECTION 02300 – EARTHWORK AND GRADING.
- F. Class II Aggregate Base: 3/4-inch maximum, Class II AB, free from organic matter and other deleterious substances and conforming to CSS Section 26-1.02.
- G. Water: Clean and free from deleterious amounts of acids, alkalis, salts and organic matter.

2.2 BURIED WARNING AND IDENTIFICATION TAPE

- A. Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 75 mm 3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.
1. Warning Tape Color Codes.
Red: Electric.
Yellow: Gas, Oil; Dangerous Materials.
Orange: Telephone and Other Communications.
Blue: Water Systems.
Green: Sewer Systems.
White: Steam Systems.
Gray: Compressed Air.
 2. Warning Tape for Metallic Piping: Acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 0.003 inch. Tape shall have a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.
 3. Detectable Warning Tape for Non-Metallic Piping: Polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of the tape shall be 0.004 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 920 mm 3 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

2.3 DETECTION WIRE FOR NON-METALLIC PIPING

- A. Detection wire shall be insulated single strand, solid copper with a minimum of 12 AWG.

PART 3 – EXECUTION

3.1 GENERAL

- A. Prior to commencement of work, become thoroughly familiar with site conditions.
- B. In the event discrepancies are found, immediately notify the Owner's Representative in writing, indicating the nature and extent of differing conditions.
- C. Backfill excavations as promptly as work permits.
- D. Do not place engineered fill or backfill until rubbish and deleterious materials have been removed and areas have been approved by the Owner's Representative.
- E. Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below.
- F. In excavations, use satisfactory excavated or borrow material.
- G. Under grassed areas, use satisfactory excavated or borrow material.

3.2 COMPACTING

- A. Compact by power tamping, rolling or combinations thereof.
 - 1. Where impractical to use rollers in close proximity to walls, stairs, etc., compact by mechanical tamping.
 - 2. Scarify and recompact any layer not attaining compaction until required density is obtained.

3.3 SITE PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, which are to remain, from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect existing storm drainage system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to the Owner.

3.4 EXISTING UTILITIES:

- A. Identify the location of existing utilities.
 - 1. Prior to trenching, the Contractor shall excavate at locations specifically indicated on the Drawings, if any, and where new lines cross other utilities of uncertain depth and determine the elevation of the utility in question to ensure that the new line will clear the potential obstruction.
 - 2. The Contractor shall contact Underground Service Alert (USA) at 1-800-227-2600 for assistance in locating existing utilities.
 - 3. If, after the excavation, a crossing utility does present an obstruction, then the line and grade of the new line will be adjusted as directed by the Owner's Representative to clear the utility.
- B. Protect all existing utilities to remain in operation.
- C. Movement of construction machinery and equipment over existing pipes and utilities during construction shall be at Contractor's risk.
- H. Excavation made with power-driven equipment is not permitted within 2 feet of any known utility or subsurface structure.
 - 1. Use hand or light equipment for excavating immediately adjacent to known utilities or for excavations exposing a utility or buried structure.
 - 2. Start hand or light equipment excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured.
 - 3. Support uncovered lines or other existing work affected by excavation until approval for backfill is obtained.
 - 4. Report damage of utility line or subsurface structures immediately to the Owner's Representative.
- E. Backfill trenches resulting from utility removal in lifts of 8 inches maximum. Compact backfill to at least 95 percent of the maximum dry density, per ASTM D1557.

3.5 TRENCH EXCAVATION

- A. General
 - 1. Excavation shall include removal of all water and materials that interfere with construction. The Contractor shall remove any water which may be encountered in the trench by pumping or other methods during the pipe laying, bedding and backfill operations. Material shall be sufficiently dry to permit approved jointing.

2. Excavation shall include the construction and maintenance of bridges required for vehicular and pedestrian traffic, support for adjoining utilities.
 3. The Contractor shall be responsible to safely direct vehicular and pedestrian traffic through or around his/her work area at all times.
 4. The Contractor shall relocate, reconstruct, replace or repair, at his/her own expense, all improvements which are in the line of construction or which may be damaged, removed, disrupted or otherwise disturbed by the Contractor.
- B. Existing Paving and Concrete:
1. Existing pavement over trench shall be sawcut, removed, and hauled away from the job. Existing pavement shall be neatly sawcut along the limits of excavations.
 2. Existing concrete over the trench shall be sawcut to a full depth in straight lines either parallel to the curb or a right angles to the alignment of the sidewalk.
 3. Boards or other suitable material shall be placed under equipment outrigging to prevent damage to paved surfaces.
- C. Trench Width:
1. The maximum allowable trench widths at the top of the pipe shall be as follows:

<u>Pipe Type</u>	<u>Trench Width (Maximum)</u>
Copper	Outside diameter of barrel plus 18 inches
Plastic	"
Vitrified Clay	"
Cast-Iron	Outside diameter of barrel plus 24 inches
Concrete Cylinder	"
Ductile-Iron	"
Reinforced Concrete	"
 - a. The maximum trench width shall be inclusive of all shoring.
 - b. If the maximum trench width is exceeded, the Owner's Representative or Inspector of Record may direct the Contractor to encase or cradle the pipe in concrete at no additional charge.
 2. For pipes 3 inch diameter and larger, the free working space on each side of the pipe barrel shall not be less than 6 inches.
- D. Open Trench:
1. The maximum length of open trench shall be 300 feet or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is greater. No trench shall be left open at the end of the day.
 2. Provisions for trench crossings and free access shall be made at all street crossings, driveways, water gate valves, and fire hydrants.
- E. Excavation Bracing:
1. The excavation shall be supported and excavation operations shall be conducted in accordance with the California Industrial Accident Commission and CAL/OSHA.
 2. The Contractor shall, at his/her own expense, furnish, put in place, and maintain such sheeting and bracing as may be required to support the sides of all excavations (whether above or below the pipe grade), and to prevent any movement which could in any way diminish the required trench section or otherwise injure or delay the work. The sheeting and bracing shall be withdrawn in a manner such as to prevent any earth movement that might overload the pipe.
- F. Excavated Material:
1. All excavated material not required for backfill shall be immediately removed and properly disposed of in a legal manner by the Contractor.

2. Material excavated in streets and roadways shall be laid alongside the trench no closer than 2 feet from the trench edge and kept trimmed to minimize inconvenience to public traffic.
3. Provisions shall be made whereby all storm and wastewater can flow uninterrupted in gutters or drainage channels.

3.6 PIPE BEDDING

- A. Bedding Excavation: The trench shall be excavated below the grade of the pipe bottom to the following minimum depths:

<u>Pipe Type</u>	<u>Depth</u>
Copper	3 inch
Reinforced Concrete	3 inch
Plastic: 2 inch diameter and smaller	3 inch
Cast/Ductile Iron	6 inch
Plastic: over 2 inch diameter	6 inch

1. Stabilization of Trench Bottom: When the trench bottom is unstable due to wet or spongy foundation, trench bottom shall be stabilized with gravel or crushed rock. The Geotechnical Engineer of Record will determine the suitability of the trench bottom and the amount of gravel or crushed rock needed to stabilize a soft foundation. Soft material shall be removed and replaced with gravel or crushed rock as necessary.
2. Placement of Bedding Material: The trench bottom shall be cleaned to remove all loose material prior to placing bedding material. Sufficient select backfill material shall be placed in trench and tamped to bring trench bottom up to grade of the bottom of pipe. The relative compaction of tamped material shall be not less than 90 percent for trench backfill placed below proposed pavement flat work and structures, the upper 3 feet of subgrade shall be compacted to 95 percent compaction. It is the intention of these requirements to provide uniform bedding under the full length of pipe to a minimum width of 60 percent of the external diameter.

3.7 TRENCH BACKFILL

- A. Initial Backfill:

1. Prior to trench backfill, the condition of the trench and laying of pipe must be inspected and approved by the Inspector of Record.
2. Trench Sand and Trench Gravel shall be used for initial backfill. After the pipe has been properly laid and inspected, initial backfill material shall be placed on both sides of the pipe and compacted to final depth as follows:

<u>Pipe Type</u>	<u>Depth</u>
Copper	6 inches above top of pipe
Cast Iron	6 inches above top of pipe
Plastic: less than 3 inches diameter	6 inches above top of pipe
Plastic: 3 inches diameter and larger	12 inches above top of pipe
Ductile Iron	12 inches above top of pipe
Reinforced Concrete	1/2 outside diameter of pipe (pipe spring line)

3. Compaction: Initial backfill compaction shall be by mechanical means. The initial backfill material shall be hand tamped in layers not exceeding 4 inches in uncompacted depth and shall be brought up uniformly on both sides of the pipe to avoid bending or distortional stress. After hand tamping, the relative compaction of the initial backfill material shall be not less than 90 percent.

4. Pipe Detection: In trenches containing pressurized plastic pipes, tracer wire shall be placed directly above the pipe and shall be connected to all valves, existing exposed tracer wires, and other appurtenances as appropriate.
- B. Subsequent Backfill:
1. Subsequent backfill material shall consist of approved native material, imported fill, or Class II AB conforming to these specifications.
 2. Structure and utility trench backfill should be moisture conditioned, placed in lifts eight inches or less in loose thickness, and mechanically compacted to at least 90 percent relative compaction except the relative compaction shall not be less than 95 percent within 2-1/2 feet of finished permanent surface grade or 1-1/2 feet below the finished subgrade, whichever is greater; jetting will not be permitted. The moderately expansive clay soils exposed in trenches should not be allowed to dry out prior to placement of trench backfill materials.
 3. It shall be the Contractor's responsibility to select equipment and procedures that will accomplish the grading as described above. He/she must organize his/her work in such a manner that the Geotechnical Engineer can test and/or observe each element of grading.
- C. Jetting and Ponding:
1. Jetting of trench backfill is not permitted.
- D. Compaction Testing:
1. Compaction testing shall be in accordance with California Test Method ASTM D6938.

3.8 TRENCH SURFACING

- A. Unpaved Areas:
1. In unimproved areas, the trench surface shall be restored to its original condition. No mounds of earth shall be left along the trench. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
 2. Where completed compacted areas are disturbed by subsequent construction operation or adverse weather, scarify surface, reshape, compact to required density and provide other corrective work, including retesting, prior to further construction.
- B. Temporary Surfacing:
1. Temporary surfacing shall be a minimum of 2 inches of cutback asphalt on 10 inches of Class 2 aggregate base and shall be placed at all trench locations subject to vehicular or pedestrian traffic.
 2. Temporary surfacing shall be laid within one day after backfilling (except where the Contractor elects to place permanent surfacing within this time period).
 3. Before the trenching area is opened for traffic, all excess dirt, rock, and debris shall be removed, the street surface shall be swept clean and the pavement shall be washed down with a water truck and pressure nozzle.
 4. Temporary surfacing shall be maintained to prevent the occurrence of mudholes and prevent the surface from settling below 1 inch or rising more than 1 inch from the existing pavement grade.

3.9 FILL AND COMPACTING

- A. General Requirements:
1. Backfill excavations as promptly as work permits.
 2. Do not place engineered fill or backfill until rubbish and deleterious materials have been removed and areas have been approved by the Owner's Representative.
 3. Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below.

4. In excavations, use satisfactory excavated or borrow material.
 5. Under grassed areas, use satisfactory excavated or borrow material.
- B. After subgrade compaction has been approved by the Geotechnical Engineer, spread the engineered fill materials in 6 to 8 inch loose lifts and uniformly mixed during the spreading operation.
1. Bring non-expansive fill materials to or slightly above the optimum moisture content and compacted to at least 90 percent of the maximum laboratory dry density, per ASTM D6938.
 2. Bring non-expansive aggregate fill materials to or slightly above the optimum moisture content and compacted to at least 95 percent of the maximum laboratory dry density, per ASTM D6938.
 3. Do not compact the top 12 inches of soil in the planting areas.
 4. Fill sections greater than 5 feet in depth shall be compacted to at least 95 percent.
- C. Repeat compaction procedure until proper grade is attained.
- D. Rocks generated during site earthwork may be used in fill when conforming to material specifications, as approved in the field by the Geotechnical Engineer.

3.10 MOISTURE CONTROL

- A. Do not resume operations until moisture content and fill density are satisfactory to the Geotechnical Engineer.

3.11 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Removal of Excess Excavated Material: Excess material shall be removed by the Contractor off the site in a legal manner.

3.12 PROTECTION

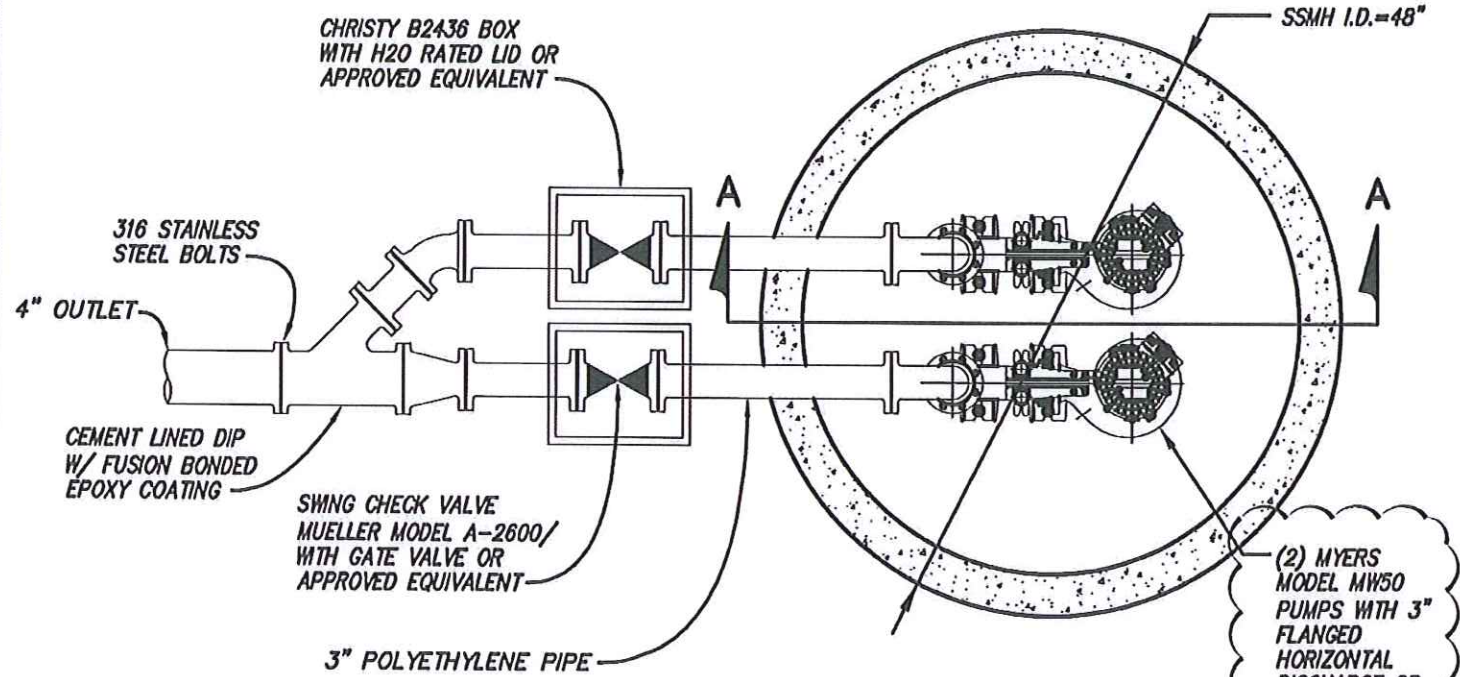
- A. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- B. Where completed compacted areas are disturbed by subsequent construction operation or adverse weather, scarify surface, reshape, compact to required density and provide other corrective work, including retesting, prior to further construction.
- C. In unpaved areas without landscaping, cover with straw erosion control blanket. Follow manufacturer's recommendations for installation. Provide and place straw wattles or biodegradable fiber logs across the slope at the midpoint and along the downhill edge of site. No soil is to be left uncovered at the completion of construction.

3.13 CLEAN-UP

- A. Remove all debris, equipment, tools and materials upon completion prior to final inspections to the satisfactions of the Owner's Representative.
- B. Comply with requirements of SECTION 01700 - CONTRACT CLOSEOUT.

END OF SECTION 02315

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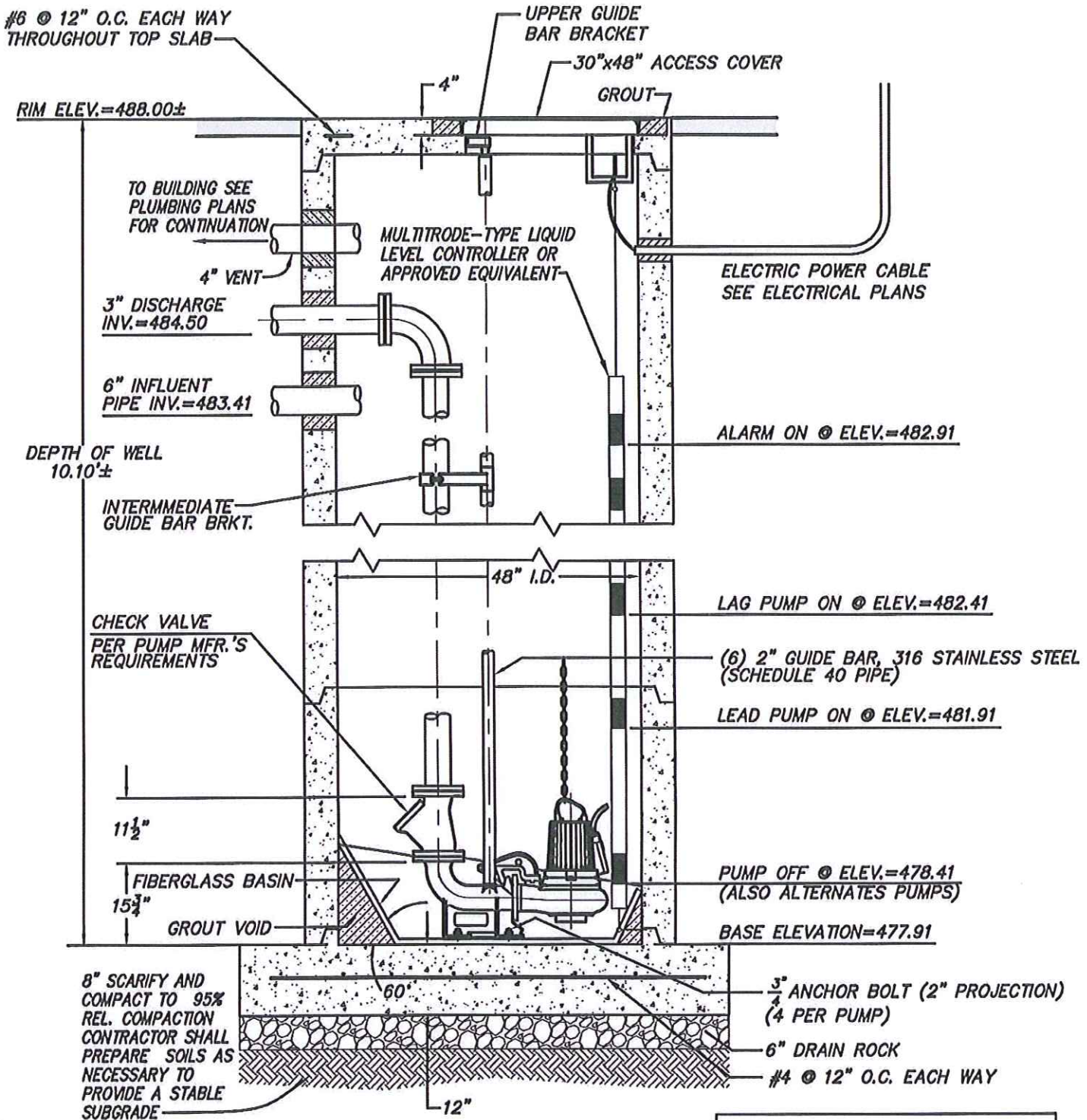


PLAN VIEW

PUMP STATION (30)
N.T.S.



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MOUNTAIN VIEW ROSEVILLE OAKLAND



SECTION A-A

NOTE:
1. ALL BOLTS, NUTS, AND WASHERS TO BE 316 STAINLESS STEEL UNLESS OTHERWISE NOTED.

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BEVERLY PRIOR architects office 222 SUTTER STREET, 9TH FLR SAN FRANCISCO, CA 94108 phone 415.777.9422 fax 415.777.2755 247bparch.com	drawing title CIVIL CONSTRUCTION DETAILS, C-603	proj. 2536.01
		scale N.T.S. date 11-24-08

PLANTING LEGEND

SYMBOL	SCIENTIFIC NAME	COMMON NAME	SIZE	HEIGHT	SPR.	CAL.	REMARKS	QTY.
TREES								
	PYR CAL	PYRUS CALLERIANA 'ARISTOCRAT'	CALLERY PEAR	24" Box	10-12'	4-6'	1-3/4 - 2-1/4"	12
	QUE LOB	QUERCUS LOBATA	VALLEY OAK	24" Box	8-10'	3-4'	1 - 1-1/2"	16
	QUE AGR	QUERCUS AGRIFOLIA	COAST LIVE OAK	24" Box	8-10'	3-4'	1 - 1-1/2"	16
	PRU YED	PRUNUS YEDOENSIS 'AKENBONO'	FLOWERING CHERRY	24" Box	8-10'	3-4'	1 - 1-3/4"	14
MEDIUM SHRUBS & HEDGES								
	RHA CAL	RHAMNUS CALIFORNICA	COFFEEBERRY	5 GC				177
ACCENT SHRUBS & SPECIALTY PLANTING								
	HEM STA	HEMEROCALLIS X. STARBURST ORANGE	DAYLILY	5 GC				
	SAL LEM	SALVIA LENCANHA	MEXICAN BUSH SAGE	5 GC				186
	ROS ICE	ROSA 'ICEBERG'	ICEBERG ROSES	5 GC				41
	NEP FAS	FRONT GARDEN BLEND - NEPETA X FAASSENII	CATMINT	5 GC				39
	LAM MAC	- LAMNAC MACULATA 'BEACON SILVER'	SPOT NECK FILE					164
	ANI FLA	- ANIGOZANTHOS HYBRID 'BUSH PEARL'	KANGAROO PAW					58
	STA BYZ	TEXTURAL GARDEN BLEND - STACHYS BYZANTINA	LAMBS EARS	5 GC				104
	CIS INC	- CISTUS INCANUS	ROCKROSE					8
	HEL HEN	- HELIANTHEMUM 'HENFIELD BRILLIANT'	SUNROSE					10
GROUNDCOVER & LOW SHRUBS								
	CEA GRI	CEANOTHUS GRISEUS HORIZONTALIS 'YANKEE POINT' - NCN		5 GC			SPACE 36" O.C.	6057 SF
	RIB VIB	RIBES VIBURNIFOLIUM	EVERGREEN CURRANT	5 GC			SPACE 18" O.C.	3791 SF
	ROS IRE	ROSMARINUS 'IRENE'	IRENE ROSEMARY	5 GC			SPACE 24" O.C.	129 SF
	TRA JAS	TRACHELOSPERMUM JASMINOIDES	STAR JASMINE	1 GC			SPACE 18" O.C.	2154 SF
BIOSWALE/BIORETENTION								
	CAR BAR	CAREX BARBARAE	SANTA BARBARA SEDGE	1 GC			SPACE 18" O.C.	2972 SF
	JUN PAT	JUNCUS PATENS	COMMON RUSH	1 GC			SPACE 24" O.C.	1848 SF
	FES RUB	FESTUCA RUBRA MOLATE	RED FESCUE	1 GC			SPACE 12" O.C.	3927 SF

NOTE: THE TOTAL QUANTITIES TABULATED ON THE DRAWINGS ARE CONSIDERED APPROXIMATE AND FURNISHED FOR CONVENIENCE ONLY. CONTRACTOR SHALL PERFORM HIS/HER OWN PLANT QUANTITY CALCULATIONS AND SHALL PROVIDE ALL PLANTS SHOWN ON DRAWINGS.

prepared by (rm)

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project

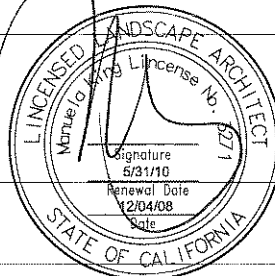
Las Positas College
CHILD DEVELOPMENT CENTER
Livermore, CA

DSA File No. 1-C2

DSA Appl. No. 01-109257

drawing title

LS-101



drawing no.










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scale.

date **12-05-08**

MATERIALS LEGEND

SYMBOL	SURFACE
	POURED IN PLACE CONCRETE PAVING WITH SAWCUT JOINTS, MEDIUM SANDBLAST FINISH
	CRUSHED ROCK (MAINTENANCE PATH)
	WALK-OFF MAT, SEE ARCHITECTURAL DRAWINGS
	ROCK MULCH
	NATURALPAVE RESIN PAVING
	BLACK VINYL COATED CHAIN LINK FENCE
	REMOVABLE BOLLARD
	PEDESTRIAN POLE LIGHTS
	MINI BOLLARD LIGHTS

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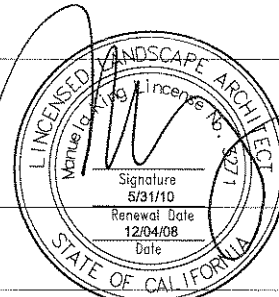
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DSA File No. 1-C2 DSA Appl. No. 01-109257

drawing title

LS-101



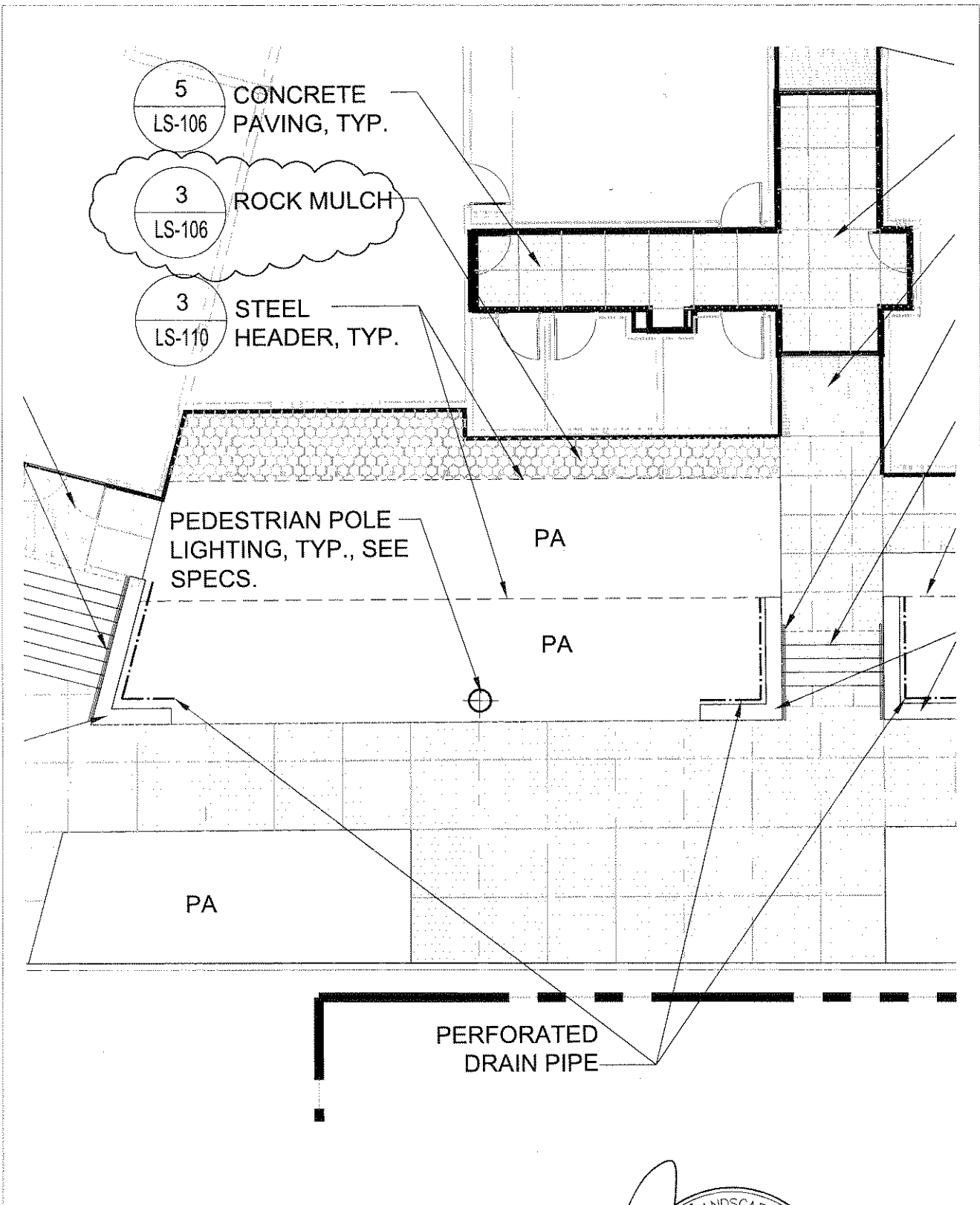
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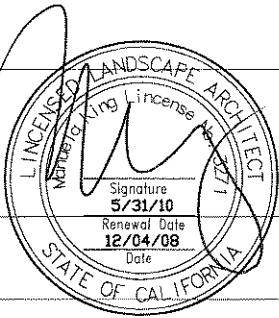


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CHILD DEVELOPMENT CENTER
Livermore, CA
DSA File No. 1-C2 DSA Appl. No. 01-109257

drawing title
LS-104.1

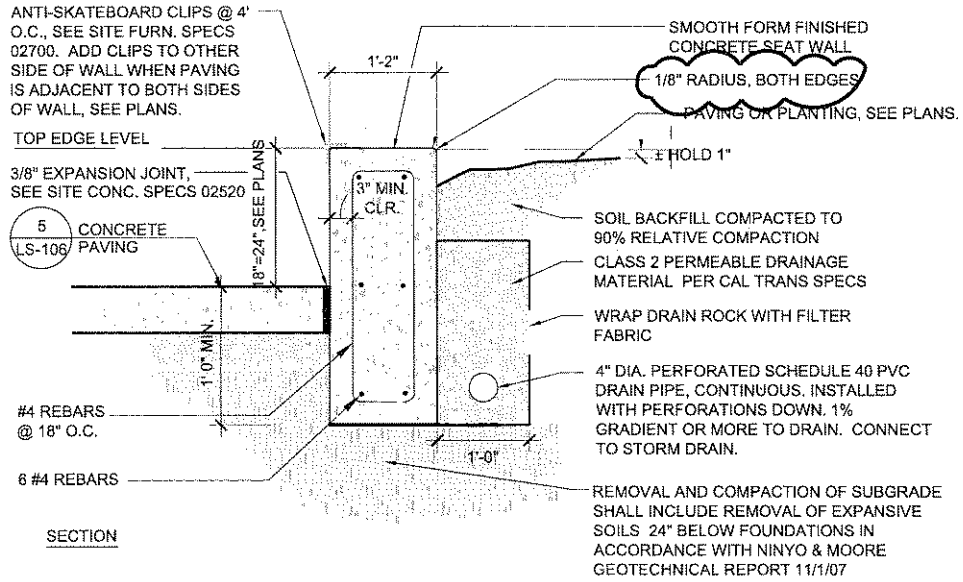


drawing no.
ADD3-LS3

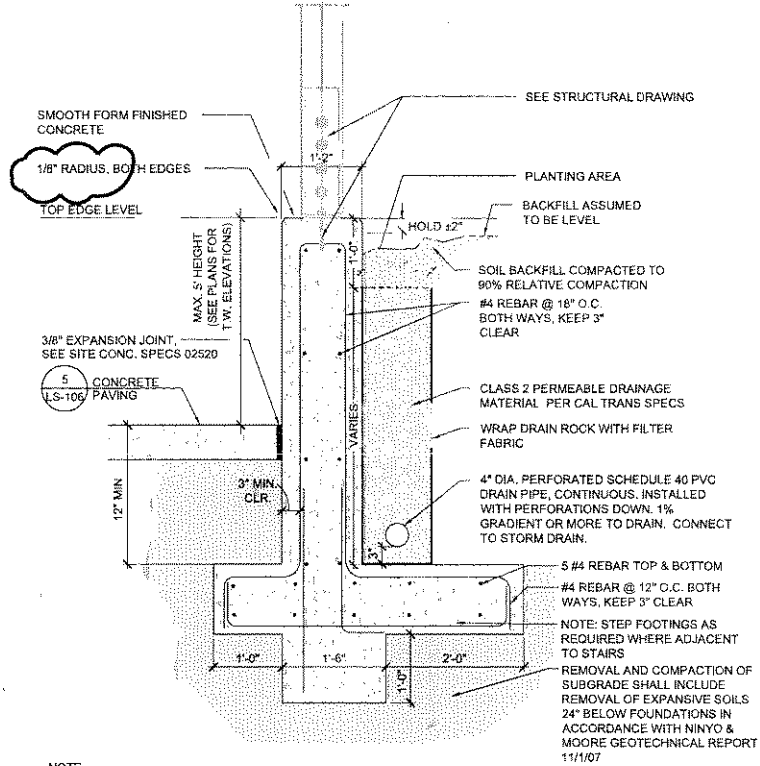
proj. 2536.01

scale 1"=10'-0"

date 12-05-08



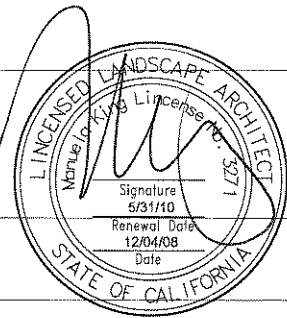
1 SEATWALL

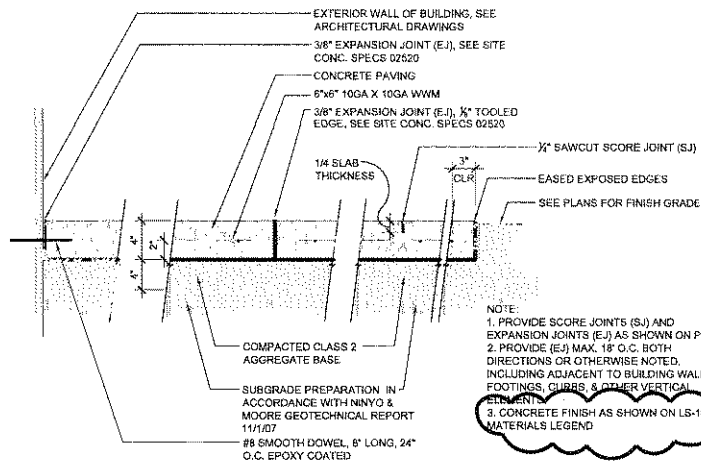


NOTE
1. SEE CIVIL DRAWINGS FOR VERTICAL AND HORIZONTAL CONTROLS - ROUGH GRADING
2. SEE LS-103.2 FOR FINE GRADING AND TW ELEVATIONS

2 RETAINING WALL

prepared by (r/m)		project		drawing no.	
R H A A		Las Positas College		ADD3-LS4	
office		CHILD DEVELOPMENT CENTER		proj. 2536.01	
225 MILLER AVE		Livermore, CA		scale.	
MILL VALLEY, CA 94941		DSA File No. 1-C2		date 12-05-08	
phone 415.383.7900		DSA Appl. No. 01-109257			
fax 415.383.1433		drawing title			
24/7 rhaa.com		LS-106			

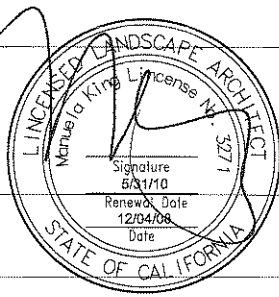




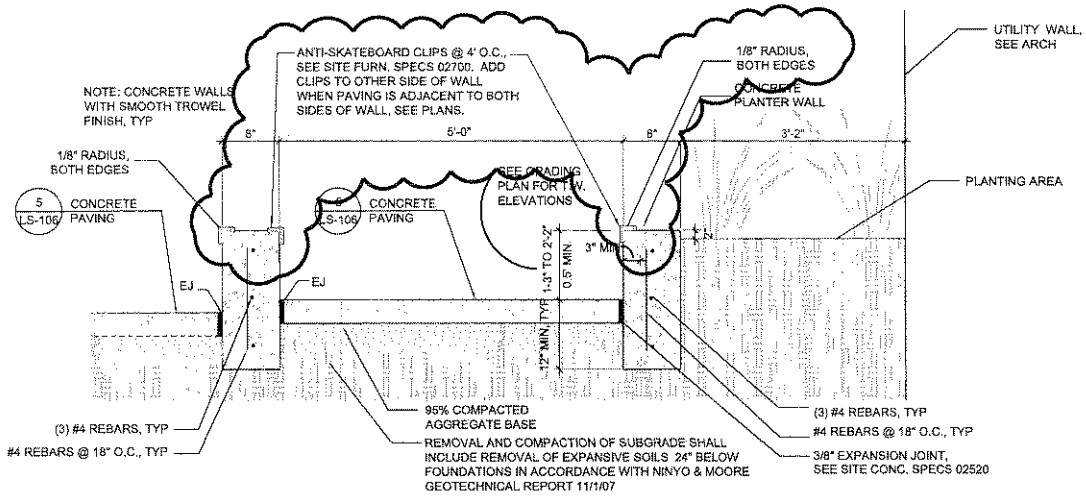
5 CONCRETE PAVING

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 drawing title
LS-106



drawing no.
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 proj. **2536.01**
 scale **1/2"=1'-0"**
 date **12-05-08**



3 SLOPED WALKWAY

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project

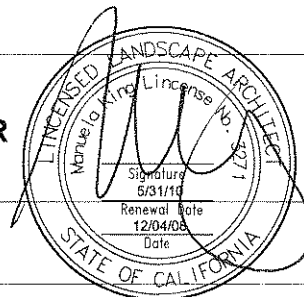
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DSA File No. 1-C2

DSA Appl. No. 01-109257

drawing title

LS-106.1



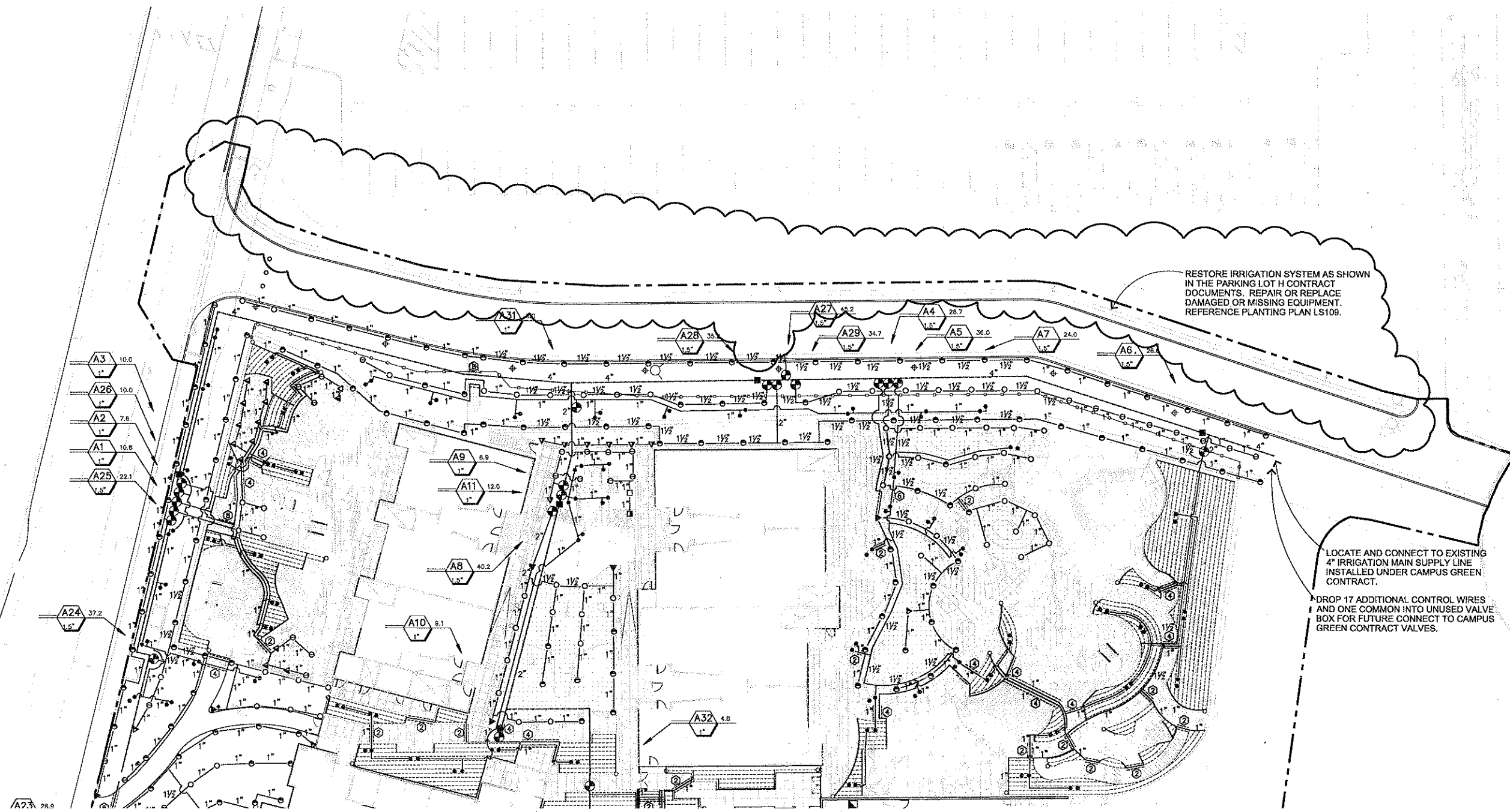
drawing no.

ADD3-LS6

proj. 2536.01

scale.

date 12-05-08



RESTORE IRRIGATION SYSTEM AS SHOWN IN THE PARKING LOT H CONTRACT DOCUMENTS. REPAIR OR REPLACE DAMAGED OR MISSING EQUIPMENT. REFERENCE PLANTING PLAN LS109.

LOCATE AND CONNECT TO EXISTING 4" IRRIGATION MAIN SUPPLY LINE INSTALLED UNDER CAMPUS GREEN CONTRACT.

DROP 17 ADDITIONAL CONTROL WIRES AND ONE COMMON INTO UNUSED VALVE BOX FOR FUTURE CONNECT TO CAMPUS GREEN CONTRACT VALVES.

SCALE: 1" = 40'-0"



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drawing title
LS-107



drawing no.
ADD3-LS7
proj. 2536.01
scale.
date 12-05-08



SCALE: 1" = 40'-0"



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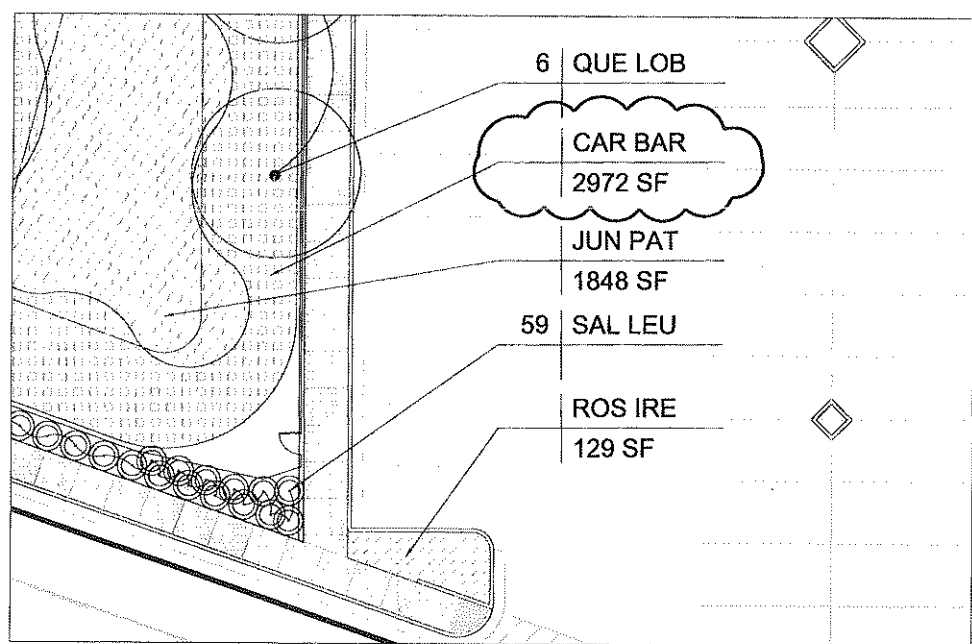
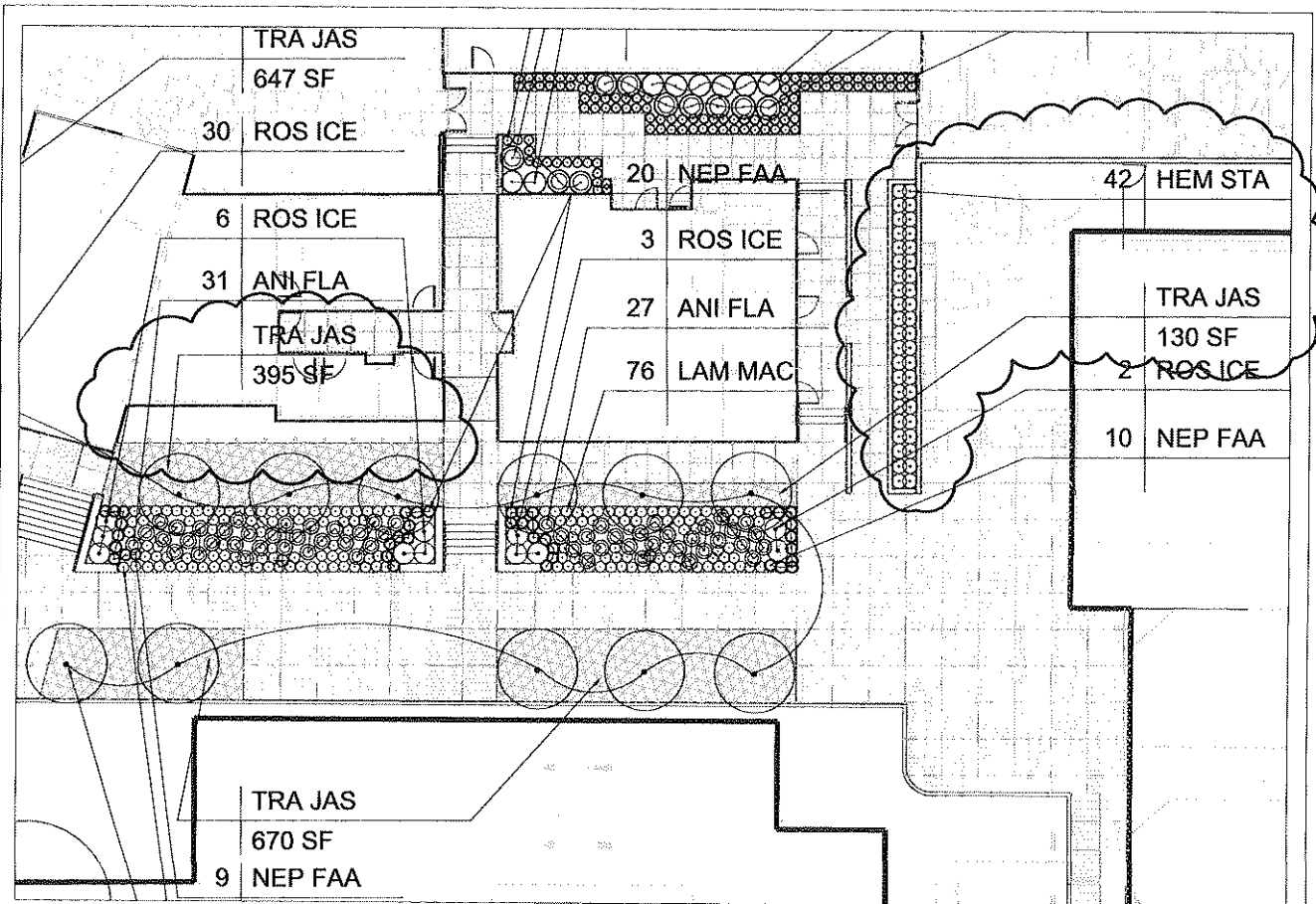
drawing title
LS-109



drawing no.
ADD3-LS8

proj. 2536.01

scale.
date 12-05-08

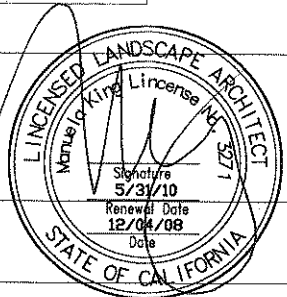


prepared by (firm)
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drawing title
LS-109



drawing no.
ADD3-LS9

proj. 2536.01

scale 1"=10'-0"

date 12-05-08

