County of El Paso Purchasing Department
500 East San Antonio, Room 500
El Paso, Texas 79901
(915) 546-2048 / Fax: (915) 546-8180

ADDENDUM 6

To: All Interested Proposers

From: Linda Gonzalez, Inventory Bid Technician

Date: March 4, 2008

Subject: BID # 08-010, Construction of the Ysleta Annex

- **Correction the following pages are for Addendum 6 not Addendum 5.**
- **The Purchasing Department received questions relating to the above referenced proposal.**
- **Addendum 6 is available on our website at www.epcounty.com –click on Bids & More and then click on Addendum 6.**
- **Copies of Addendum 6 are available at the Purchasing Department located at 500 East San Antonio, room 500. Please call (915) 546-2195 in advance to request a copy.**

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NEW YSLETA ANNEX

Bid No 08-010

COUNTY OF EL PASO

EL PASO, TEXAS

ADDENDUM NUMBER FIVE **March 3rd, 2008**

The following constitutes changes, deletions, additions, and/or clarifications to the contract documents for the project titled herein. This addendum is hereby made a part of and shall be attached to each set of Contract Documents. The Contractor on the proposal form shall acknowledge addendum. Unless specifically modified herein, all work shall remain as indicated in the Contract Documents.

PROJECT MANUAL

The following clarifications and/or changes apply to the Project Construction Documents

1. Response to Request for Information: Add "Response to Requests for Information" provided with this Addendum.

TECHNICAL SPECIFICATIONS

1. Section 01 62 35 – Special Environmental Requirements: Replace Section 01 62 35 with Section 01 62 35 provided with this Addendum.
2. Section 01 74 19 Construction Waste Management: Replace Section 01 74 19 with Section 01 74 19 provided with this Addendum.
3. Section 06 40 00 Interior Architectural Woodwork: Add the following:

   Add to paragraph 1.2.A
   4. Wood cabinets.
   6. Wood Trim
   4. Plywood paneling.

   Add to paragraph 1.2.B:

3. Division 9 Section "Painting" for field finishing of installed interior architectural woodwork.

Add paragraph 2.3 WOOD CABINETS FOR TRANSPARENT FINISH

A. Quality Standard: Comply with AWI Section 400 requirements for wood cabinets.
B. AWI Type of Cabinet Construction: Flush overlay.
   1. Matching of Veneer Leaves: Random match.
   2. Use Oak, Maple or approved equal .
C. Semiexposed Surfaces: Provide surface materials indicated below:
   1. Surfaces Other than Drawer Bodies: Thermoset decorative overlay.
   2. Drawer Sides and Backs: Thermoset decorative overlay. Metal sides acceptable for drawer sides.
   3. Drawer Bottoms: Thermoset decorative overlay.

Add paragraph 2.6 PANELING

A. Hardwood Veneer Plywood Paneling: Manufacturer's stock hardwood plywood panels complying with applicable requirements of HPVA HP-1.

1 Face Veneer Species: Plain sliced red oak, maple or approved equal.
2 Backing Veneer Species: Any hardwood compatible with face species.
3 Construction: Veneer core.
4 Thickness: 7/16 inch (11 mm).
5 Panel Size: 48 by 96 inches (1219 by 2438 mm).
6 Panel Size: 1200 by 2400 mm.
7 Glue Bond: Type II (interior).
8 Face Pattern: Manufacturer's standard pattern of random-appearing V-grooves, with grooves at edges, center, and third points of panels.
9 Finish: Provide stain colors and finishes indicated by reference to manufacturer's standard designations.
10 Finish: As selected by Architect from manufacturer's full range of stain colors and finishes.

Add paragraph 2.7 INTERIOR ORNAMENTAL WORK FOR TRANSPARENT FINISH

A. Quality Standard: Comply with AWI Section 700.

B. Hardwood Trim: Provide finished hardwood lumber and moldings complying with the following requirements:
   1. Species: Clear, kiln-dried hardwoods.
   2. Species and Cut: Rift-sawn, clear, kiln-dried oak selected for compatible grain and color.
   3. Texture: Surfaced (smooth).
   4. Lumber for Transparent Finish (Stained or Clear): Solid lumber stock.
   5. Lumber for Painted Finish: Glued-up lumber or solid lumber stock.

Add paragraph 2.9 SHOP FINISHING OF INTERIOR ARCHITECTURAL WOODWORK

A. Quality Standard: Comply with AWI Section 1500, unless otherwise indicated.
B. Transparent Finish: Comply with requirements indicated below for grade, finish system, staining, and sheen, with sheen measured on 60-degree gloss meter per ASTM D 523.
   1. Grade: Custom.
   2. AWI Finish System TR-5: Catalyzed vinyl lacquer.
   3. Staining: Match approved sample for color.
   4. Sheen: Gloss 80-100 gloss units.

Add paragraph 3.6 PANELING INSTALLATION

A. Plywood Paneling: Select and arrange panels on each wall for best match of adjacent panels where grain character or color variations are noticeable. Install with uniform tight joints between panels.
   1. Attach panels to supports with manufacturer's recommended panel adhesive and fasteners. Space fasteners as recommended by panel manufacturer.
   2. Conceal fasteners to greatest practical extent.
   3. Arrange panels with grooves and joints over supports, and fasten to supports with nails of type and at spacing recommended by panel manufacturer. Use fasteners with prefinished heads matching groove color.

4. <u>Section 07 52 16 – SBS Modified Bituminous Membrane Roofing</u>:

Revise paragraph 2.2, subparagraph A. “Provide 4-inch thickness” in lieu of “2-inch thinckness”.

Revise paragraph 2.3, subparagraph 2. Ply Sheet to be “Type VI” in lieu of “Type IV” and omit subparagraph 9 in its entirety.

Field applied acrylic coating is acceptable. Coating shall be installed in accordance with manufacturer's specifications and project manual as well as provide equal performance than factory installed acrylic coating.

5. Section 07 90 00: Joint Sealers: Add to Section 07 90 00 Part 3 – Execution – 3.1.B.6. Roof and Exterior Walls

6. Section 07 21 00: Building Insulation: Add to paragraph 1.2.A.4 Perimeter footing/underground wall insulation

7. Section 09 30 13 – Ceramic Tiling:

Eliminate Paragraph 2.03, Subparagraph c. Raised Tile

Add Paragraph 2.03, Subparagraph c. Unglazed Ceramic Mosaic Tile

Unglazed Ceramic Mosaic Tile: Provide factory-mounted flat tile complying with the following requirements:

1. Composition: Crystalline Silica as quartz, Clays and Nephiline Syenite.
2. Nominal Facial Dimensions: 2 inches by 2 inches.
3. Nominal Thickness: ¼".
4. Face: Manufacturer's standard.

Add Paragraph 2.03, Subparagraph d. Glazed Ceramic Mosaic Tile

Glazed Ceramic Mosaic Tile: Provide factory-mounted flat tile complying with the following requirements:

1. Composition: Crystalline Silica as quartz, Clays and Nephiline Syenite.
2. Nominal Facial Dimensions: 2 inches by 2 inches.
3. Nominal Thickness: ¼".
4. Face: Manufacturer's standard.

8. Section 09 65 19 – Resilient Linoleum Floor Tiling:

Replace Section 09 65 19: Resilient Linoleum Tiling with Section 09 65 19 Linoleum Composition Tile attached.

9. Add the following Sections for Communication & Data work:

Section 27 05 00 - COMMON WORK RESULTS FOR COMMUNICATIONS
Section 27 11 00 - COMMUNICATIONS EQUIPMENT ROOM FITTINGS
Section 27 13 00 - COMMUNICATIONS BACKBONE CABLING
Section 27 15 00 - COMMUNICATIONS HORIZONTAL CABLING

CONSTRUCTION DRAWINGS

1. AD-1.1 – Monumental Sign Elevation: Add drawing AD1.1 attached for monumental sign (typical of 2) to be included as part of the Base Bid.
2. AD-1.2 – Alternate 1 (1A, 1B, 1C)": Add drawings AD1.2, AD1.2.1, AD1.2.2 and AD1.2.3 for additional information for finishes, doors and dimensions for Alternate #1 (1A, 1B, 1C).
3. AD-1.3 – Detail Wall section at Rock Veneer: Add drawing AD-1.3 for typical detail at Rock Veneer installation.
4. AD-1.4 – Building Column Furr Out Detail: Add drawing AD1.4 for typical steel furr-out column at exterior building entrance porches.
5. AD-1.5- Typical Decal at Entrances: Add drawing AD-1.5 for typical decal sign at all entrance doors of each department for Base Bid and Alternate 1.
6. AD1.6- Partial Building A Exterior Elevation: Add drawing AD-1.6 for additional rock veneer work.
7. Replace Light Fixture and Cable Tray Schedules on Sheet E5.01 with attached Light Fixture and Cable Tray Schedules
8. Revise air flow quantities at individual diffusers from RTU-06 and RTU-07 to read: Type "A", 250 cfm, 10" diameter neck. CFM quantity for rooftop units on schedule is correct.
9. Revise "Air Conditioning Unit Schedule" sheet M4.00, RTU-09 CFM Quantity to read: "1420 vs 1500"
10. Revise note no 2, in "boxed notes", sheet M4 to read: As part of this contract, the HVAC contractor will schedule and conduct a training session for the County of El Paso personnel to familiarize them with all installed components, systems and equipment. Coordinate with general contractor.
11. Provide and install one carbon dioxide detector per packaged roof top air conditioning unit. Locate CO detector adjacent to space temperature control sensor, serving corresponding roof top unit, and tie-in CO sensor to building automation system.
12. Replace Waste and Water Riser Diagrams originally shown on drawings, with the attached drawings R1-R10.

ATTACHMENTS

Geotechnical Engineering Study: Add for reference Geotechnical Engineering Study by Licon Engineering Nº PO7212 dated October 22, 2007 including addendum.

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ADDENDUM 5

March 3rd 2008

County of El Paso
Construction of the New Ysleta Annex Bid No. 08-010

Response to Requests for Information

1. In reviewing the specifications (volumes 1 & 2), what are we trying to achieve? If it is not LEED, but a Form of LEED, what are we trying to achieve?

   Refer to 01 62 35– Special Environmental Requirements new edited version attached to this addendum.

2. Based on the preconstruction conference it was indicated that this building was designed under Green Globes Design. Based on information we were able to obtain from the internet this is described as "Area and Sub-Area Assessment", where a project can receive up to 1000 points coming from? What points will the contractor be responsible? Can the Architect please provided the form that indicates how the points will be achieved?

   At this point the plans and specifications cover what the General Contractor and subcontractors are to provide. The Green Globes rating is a goal and not a requirement for the design professional nor the contractor. The Architect will present and review the Green Globes rating with the General Contractor and subcontractors and assist the team with developing the necessary documentation as per Project Manual.

3. Is the contractor to provide LEED material at all cost or use material that will provide the owner with lowest cost for the project?

   This project has not and will not apply for LEED certification. The contractor is to provide materials as per specifications. LEED certified products and materials are not a requirement. Refer to 01 62 05 and 01 62 35.

4. Will the Owner be responsible for the frontage fees, meter fees, utility charges for this project? Will I be the contractor responsible to coordinate their installation only?

   The Owner will be responsible for the frontage fees and meter fees associated with the utilities hook-ups. General Contractor and

subcontractors are responsible for coordination of all work in accordance with the specifications.

5. Will the Owner be performing, through its geotechnical consultant, all dirt work, paving and concrete site and lab testing?

   Refer to General Specification, Article 118. Sample, Certification and Testing and Section 01 45 00 – Quality Control.

6. UL Fire Label "C" on door schedule sheets A101 & A111 needs to be defined.

   Rating signifies a 20-minute door.

7. Door #102 is noted as Dutch door; please provide elevation and shelf information if a shelf is required.

   Refer to attached Technical Data Sheet DS-106 by Mesker or equal.

8. Door #157 is shown as a Vault door. Please provide Vault Door Manufacturer Specification. Details and Elevations.

   Refer to attached Technical Data Sheets by Diebold or equal.

9. Have all the Utility Companies been given Plans and Specs?

   Utility Companies have not been given plans at this time. Contractor's responsibility, refer to 01 31 13 – Coordination.

10. Please provide Utility Company Point of Contacts along with direct phone numbers.

    Contractor's responsibility, refer to 01 31 13 – Coordination. To date utility companies contacts are as follows:

PSB	***Lorenzo Hernandez***	***594-5537***
Texas Gas	***Armando Martinez***	***680-7280***
El Paso Electric	***Paul Elloreaga***	***543-2266***

11. Bid Form indicates an Alternate 1 (A, B, & C), for interior finish out of these areas, however no information as to the finishes are provided within the drawings. Will this be provided?

    Refer to attached Addendum drawings AD-1 series for Alternate 1 (1A, 1B, & 1C).

12. What other forms, besides the Bid Form and Bid Bond, are to be included with the bid for this project?

    Please refer to Project Manual, Volume One 0f Two, General requirements page 1-73

13. How can we get separate copies of Bid Forms?

County Purchasing will provide

14. If the lower bidder is not approved as a subcontractor by the Local Public Agency who will assume the difference in cost if a higher bidder is approved?

The General Contractor shall assume the cost. Refer to General Conditions-103 Subcontractors

15. Section 01 57 00, page 1 item 1.4B; indicates the contractor will provide covered walkways if required by the governing authority. Will this be requirement under base bid for this project? If so how many?

Work performed within the property line limits should not require walkways. It may be Contractor's responsibility for work to be done within public right-of-way or as may be required by an ordinance.

16. Section 01 62 05, page 2, item B1.q and B1.s indicate to be of recycled content material. Can this be reviewed, based on conversation with manufactures of these types of products; they cannot be obtained as recycled material?

Refer to 01 62 35, 1.2 A & B – some products provide a certain percentage of recycled material post or pre-consumer, our goal is to use those as possible and if available. For example in reference to B1.s Roppe has available a standard vinyl base that included 10% post-industrial waste others like VPI Corp. have 30% pre-consumer content.

17. Section 01 62 35, page 4 and 5, item 1.3; is this testing and monitoring performed by owner's consultant? Is the contractor responsible for any portion of the monitoring?

Refer to revised Section 01 62 35. Testing and monitoring are specified in Commissioning and Mechanical sections of the Project Manual.

18. Section 01 74 19, page 2 item C; indicates the contractor will develop a "construction waste management plan" that will generate 25% of salvage/recycling material as reflected under item D. What if the 25% is not met? Who is accepting recycled material other than concrete, block, cardboard, plastic and metals? Note: based on previous conversation with the local Waste Management Companies none of the other material is recycled.

The Contractor is to make an effort to meet the Owner's environmental goals for this project. We are aware that few construction waste materials have a recycle outlet in El Paso and that the 25% recycled waste goal may not be attainable. We have attached a list to assist the bidders

in Section 01 74 19 – paragraph 3.3. Refer to attached revised Section 01 62 35 and 01 74 19.

19. Section 01 91 13, page 38, item 5a; what do you mean "is responsible for a deficiency"? Is the Commissioning Consultant going to have employees on site during the construction of the project on a daily bases? If not, how many times will the Commissioning Consultant be required to be on site? What is the Commissioning Consultant going to charge for retest? What re-performing of the "Pre-Installation" is the Commissioning Consultant talking about?

The general contractor is responsible for coordinating the work of its subcontractors, so the general contractor will determine which subcontractor or contractor is "responsible for a deficiency". In most cases, the responsible party will be obvious. For example, if a chiller does not work, it will most likely be the responsibility of the HVAC contractor to make it work.

The commissioning authority's representatives will visit the site several time each week. The frequency will vary based on the status of construction and the type of work being performed on site during each week.

The commissioning authority will not charge for the initial test and will not charge for the first re-test. Thereafter, the commissioning authority will charge $100 per hour. The owner will add 25% so the contractor will have to pay $125 per hour for repeat tests.

Pre-installation is defined on page 23.

20. Section 01 91 13, is the general condition as stated by the Owner and Architect on how and what makes up a change order to govern or is the Commissioning Consultant requirements to govern? (Example page 38, item 6, 7 & 8).

Page 38, items 6, 7, and 8 do not describe change orders.

21. Section 01 91 13, page 40, item 1.18; the commissioning report will be filled out by the Commissioning Consultant staff. The General Contractor will not be required to participate, is this correct?

The commissioning authority will prepare the commissioning report.

22. Section 01 91 13, page 41, item 11; if the Commissioning Consultant is the ultimate authority on determining if the training goals have been met, can Commissioning Consultant please provide a list of requirements that will need to be met.

Training requirements are defined in paragraph 1.19 of section 01.91.13 and other sections of the specification.

23. Section 04 42 00, page 2.2; since Mount Franklin Quarries produce several colors with different pricing depending on the rock material, what rock do you want the contractor to include in the bid (standard Franklin gray, Franklin red, etc)? Please clarify.

Provide standard Franklin Red.

24. As per specification my understanding that the roofing system consists of a 2" ISO Insulation, ½" perlite, base sheet, 3 plys of Ply IV sheets, and an aluminum coating. In the specification is also specifies a white coated cap sheet. Which is the system that we go with? A clarification on the roofing system would be greatly appreciated.

Polyisocyanurate insulation is to be 4-inch thick throughout the roof areas with a ½" perlite board. The SBS roofing consist of a base sheet, 3 plys of Type VI and a surfacing sheet with white acrylic coating. Refer to Section 07 52 16 and Technical Specifications revisions Addendum 1.

25. Section 07 52 16 indicated the use of a SBS Modified Bituminous Membrane Built-Up Roofing System. Can we use a .075 TPO Single ply, which would add additional LEED points and includes recycled material?

Again, this project has not applied for LEED Certification. The SBS roofing cap sheet specified has a LRC adequate for the project as designed. The Owner will consider alternative materials if adequate for life cycle cost and maintenance. At this time the specified roofing is the roofing of choice and no other roofing type has been approved or specified. Refer to Technical Specifications revisions Addendum 1 for Section 07 52 16.

26. Section 08 71 00, page 9, item 3.1A; indicates the hardware to be installed by the hardware subcontractor. This will restrict the ability of the general contracts to obtain more than one bid for this work. Since the general contractor along with all subcontractors are required to have an apprentice program, can the general contractor install the doors and hardware?

The General Contractor can install the doors but not for the hardware.

27. Section 08 71 00, page 2, item 1.4B; as written limits the supplier to ONLY one local (sole source) supplier! Can this be changed to allow for qualified suppliers within a 150 mile radius?

Yes, if all other requirements are maintained.

28. Section 08 71 00, page 3 & 6, item 2.1A.3/2.5A&B; indicates a restricted keyway and lock manufacturer as per El Paso County. Is the County of El Paso trying to standardize all new construction? Will County of El Paso accept other manufacturers that accept Primus cores? Note: County of El Paso existing buildings do not use this system throughout.

The County <u>will not</u> accept other manufacturers. Provide as per specifications.

29. <u>Section 09 30 13</u>, Page1, item 20.01A; does not indicate any manufacturer, does this mean the contractor can use any manufacturer?

Yes the contractor may use any manufacturer provided materials meet the requirements of the specifications. Refer to Technical Specifications revisions Addendum 1 for Section 09 30 13.

30. Please provide specifications for ceramic tile F3 to be used at floors.

Ceramic Tile F3 to be unglazed ceramic mosaic tile. Refer to revised Section 09 30 13 attached.

31. Please provide specifications for ceramic tile used at columns of property line fence, benches, and sidewalks, as detailed in Sheets AC-101 – AC103.

Refer to Technical Specifications revisions Addendum 1. Accent tile is to be placed on all 4 faces of columns. Provide a mix of 4 manufacturer's standard colors per side.

32. Is quarry tiling, as listed on specification Section 09 30 16, to be used at any area(s)/room(s) throughout the project? If yes, please indicate where used and details on size, color, etc.

No Quarry Tile is to be installed. Section 09 30 16 is eliminated from the Project Manual.

33. Is linoleum tile flooring (spec Section 09 65 19) to be used in place of VCT tile in both buildings per finish plan sheets A104 and A114?

Yes. All VCT references shall be changed to linoleum composition tile. Refer to revised Section 09 65 19 attached.

34. <u>Section 09 65 19</u>, Page 4 item 2.01B; indicates the use of a "heat welding rod". Is this correct; are we to weld the 20"x20" floor tile? Note: In talking with the flooring subcontractors Armstrong is no longer producing the 20"x20" floor tile because of shrinkage problems. Forbo is also considering discontinuing the 20"x20" floor tile. In both cases neither one recommends the welding of the 20"x20" floor tile as specified.

Refer to revised Section 09 65 19.

35. <u>Section 10 14 00</u> – Signage: Please clarify Type "E" thru "H" suite signage. Please provide size of signage and by mounted on each door leaf, 2 individual signs per door leaf or one? Also the type of material for those signs.

Provide as per specifications. Refer to AD-1.5 for size of signs provided Signage on doors shall be decal type.

36. I cannot find an elevation for the cast metal plaque or find allowance section as referred to in Division 1. Please provide size for plaque.

Provide two (2) plaques 30" x 18" to include dedication, county court commissioner's listing, general contractor and architect and County logo.

37. Section 10 44 13 – Fire Extinguisher, cabinets and accessories on the building "B" there are (2) Fire Extinguisher which are wall mounted, are MB 846 Wall Brackets (the type that hug and secure the fire extinguisher) needed or is the standard J-Hook for the extinguisher acceptable? Also do you want fire extinguisher decals quoted?

Units are installed in recessed mounted cabinets with backed enamel cabinets - See section 10 44 13 page 2 article 2.3.c.1. Yes provide fire extinguisher decals.

38. Interior elevation details on Sheets A4.01 and A4.11 for buildings A and B toilet plans show installation of a glazed wall tile wainscot at certain walls for every shown toilet room, as indicated. Is this tile wainscot to be also applied to the remaining wall of every toilet room and vestibules (i.e. North, East, South and West walls, as applicable) or strictly just to those walls marked in each detail plan?

Provide glazed ceramic tiles at all walls to 6'-8" AFF for Multi-stalls Public restrooms only. Glazed tile is to be installed at private office restrooms at wet walls only as shown on drawings.

39. I would like to have a clarification on the sanitary napkin disposal units being asked on the accessory schedule. There is no model number given on what is needed for the project and if either recessed or surface mounted.

The recessed waste receptacles mentioned on the specs are not show on the drawings. Do you want one on each restroom or just in certain ones?

Please refer to revised schedule below:

TOILET ACCESSORY SCHEDULE
All accessories to be provided and installed by contractor
Toilet Tissue Dispenser: *Provide Bobrick B-2888 Series or an approved equal at private single restrooms and B-2860 at public restrooms.*
Surface Mounted Sanitary Napkin Disposal*: Provide Bobrick B-254 Series or an approved equal.*
Recessed Paper Towel Dispenser/Waste Receptacle– *Provide Bobrick B-369 Classic Series for 4 inch recessed (minimum) depth or an approved equal - one on each restroom - locate close to exit - to be coordinated with architect.*
Surface Mounted Soap Dispenser: *Provide Bobrick B-2112 Classic series or approved equal*
Mirror with Stainless Steel Channel Frame: *Provide Bobrick B-165 Series or an approved equal.*

***Mop/Broom Holder**: Provide at each janitor sink Bobrick B-223X24 or approved equal*

40. Section 10 21 13 toilet compartments the summary question on the specs as well as the restrooms elevations is asking for mounting to be floor to ceiling mounting, but on 2.3 on the specs it is asking for mounting to be floor/head rail braced. Which type of mounting it is needed?

Floor to Ceiling mounting shall be used.

41. Contract documentation and specifications do not address special systems voice and data cabling. Division 27, Communications, is shown as not used in the specifications. Is this phase of construction to be e let at later date as a separate contract? Or can we expect an addendum in the near future?

Refer to added attached Section 27 05 00, 27 11 00, 27 13 00, 27 15 00.

42. Section 31 20 00 refers to the Soils Report that has not been included. Will this report be provided for the contractor review prior to bid?
Sheet S-101, general note # 2: refer to Geotechnical investigation. Can this report be provided though an addendum?

Refer to attached Geotechnical Engineering Study by Licon Engineering Nº PO7212 dated October 22, 2007 including addendum.

43. Section 32 32 25: what type of rock are we to use for the site rock walls?

There is no rock masonry work other than veneer rock masonry on the building. Section 32 32 25 is therefore eliminated from the project manual.

44. Sheet AC-101; indicates the chain link fence around the two (2) ponding areas in the rear of the project to be part of Alternate #3. Is this correct or should it be part of Base Bid?

Chain Link fence at both rear ponding areas shall be part of Base Bid with the balance of the chain link fence including the front fence to be the Alternate #3.

Sheet AC-101; indicates a chain link fence at the side and rear property line. Is this correct, and is this part of the Alternate#3?

Yes the Chain Link fence shall be part of Alternate #3 except the portion enclosing both rear ponding areas that shall be part of Base Bid.

45. Sheet AC-101; refers to the front wall along the property line to be part of Alternate number 3. In reviewing the wall elevation is also includes building letters. If Alternate #3 is not accepted are we to install the letters in the Base Bid?

Refer to attached Addendum drawing AD-1 for inclusion in Base Bid.

46. Sheet A-104, does not address the finishes within Alternate #1A, #1B & #1C. Will this be provided?

    Sheet A-101; shows the overall floor plan for building A, which includes Alternate #1A, #1B, & 1C. The requirement as called out in the bid form requires the contractor to provide a cost for each areas. Based on the information provided, we are unable to provide cost. The documents lack dimensional drawings and finishes for Alternate #1A, #1B and #1C. Is this work to be included or is the bid form to be modified?

    Refer to attached Addendum drawings AD-1.2 to AD-1.2.3 for dimensions and finishes to be included for Alternate #1 (1A, 1B and 1C).

47. Sheet A-101: indicates doors #250A, 250B, 270A, 270B, 290A & 290B are part of Alternates 1A, 1B, & 1C, is this correct or are these doors part of the base bid?

    Doors listed are part of Base Bid. All exterior finishes and doors and windows are part of the base bid.

48. Sheet A-102 & A-112, detail B2; indicates the toilet partition to be supported by the structure above. The Specifications, section 10 21 13, page 3, item 2.3 C&D indicate them to be floor mounted. Which is correct?

    Floor to Ceiling mounting shall be used.

49. Sheet A-301, wall section A3 (typical detail); indicate rock being directly applied over the CMU. Is any type of waterproofing required between the rock and the CMU wall?

    Asphalt based trowel applied waterproofing is to be installed over rigid insulation. Refer to attached drawing AD-1.3

50. Sheet A-303, wall section A3; indicates a pre-cast concrete column; however no specification or manufacture has been provided in order to provide the item in question. Can a model number and manufacture name be provided:

    Columns are coated/painted steel sheet furred out. Refer to attached drawing AD-1.4

51. Sheet U1.00 indicates a 8" sewer line being installed into an existing sewer line. Will we be required to install a manhole at this location or can we do a direct tie-in?

    As clearly specified on keyed note no 1, sheet U1.00, the connection to the existing waste main to be accomplished by the Public service Board, and not by the contractor.

SECTION 01 62 35 – SPECIAL ENVIRONMENTAL REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes Special Environmental Requirements: Work includes special environmental, sustainable, and “green” building practices related to energy conservation and efficiency, indoor air quality, and resource efficiency, including the following:
   1. Special Requirements:
      a. Require practices to ensure healthy indoor air quality in final Project.
      b. Maximize use of durable products.
      c. Maximize use of products easy to maintain, repair, and that can be cleaned using non-toxic substances.
      d. Maximize recycled content in materials, products, and systems.
      e. Require use of wood that is certified sustainably harvested by the Forest Stewardship Council (FSC) or the Sustainable Forestry Initiative (SFI).
      f. Maximize use of reusable and recyclable packaging.
      g. Maximize use of products with low embodied energy (production, manufacturing, and transportation).
   2. Construction team is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article 1.2 – Design Requirements.
B. Related Requirements:
C. Refer to Specifications sections for special environmental requirements for specific products.
   1. Section 01 62 05 – Environmental Performing Products
   2. Section 01 62 00 – Waste Management Program

1.2 DESIGN REQUIREMENTS

A. General: Owner has established with design team general environmental goals for design and for construction of Project. Contractor, subcontractors, suppliers, and manufacturers (construction team) are encouraged to participate where possible to realize Owner’s environmental goals.
   1. Intent is for environmental goals to be achieved in manner that ultimately provides safe and healthy environment for building occupants wit minimal impact on local, regional and global environment.
   2. Contract Documents are not intended to limit alternative means of achieving environmental goals.
      a. Suggestions from construction team for implementing goals are encouraged.
      b. Team approach is encouraged.

B. Environmental Goals:
   1. Refer to specific Specifications sections for more detailed constructions requirements related to specific materials and systems.

a. Energy Efficiency (Operations throughout Project Life): Materials and systems are intended to maximize energy efficiency for operation of Project throughout service life (substantial completion to ultimate disposition – reuse, recycling, or demolition). The County intents to apply for Energy Star for this project.
b. Indoor Environmental and Air Quality: Materials are selected and processes specified, such as preconditioning and temporary ventilation, to maximize healthy indoor air quality. Cleaning, surface coating, and renewal or replacement of interior materials should be feasible with lowest practical use of toxic, irritating, or odorous compounds. Ventilation system design, construction, and commissioning ensure adequate outside air supply under all anticipated conditions of use.
c. Resource Efficiency (Project Construction): Materials and systems are to maximize environmentally – benign construction techniques, including construction waste recycling, reusable delivery packaging, and reusability of selected materials.

1.3 QUALITY ASSURANCE

A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
    1. Responsibilities: Carefully review Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
    2. Meeting: Discuss Environmental Goals at following meetings.
    a. Pre-construction meeting.
    b. Pre-installation meeting.
    c. Regularly scheduled job-site meetings.
    d. Special sustainability issues meetings.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.
    1. General: Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
        a. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as "foam" plastics and "shrink-fit" plastics.

2. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by manufacturers or suppliers for reuse where program exists or where program can be developed for such reuse.
3. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for ruse or for recycling.
4. Corrugated Cardboard sand Paper: Where paper products are used, recycle as part of construction waste management recycling program, or return to material's manufacturer for use by manufacturer or supplier.
5. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to supplier or manufacturer for reuse where such program is available.

1.5 PROJECT CONDITIONS

A. No Smoking will be permitted in indoor Project site locations.
B. Certifications:
    1. Environmental Product Certification:
        a. Include manufacturer certification indicating product contains maximum recycled content possible without being detrimental to product performance or as per specifications.
        b. Include certification indicating cleaning materials comply with requirement of these Specifications.
C. Construction Ventilation and Preconditioning:
    1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate after installation. If continuous ventilation is not possible via building's HVAC system(s) then ventilation shall be supplied via open windows and temporary fans, sufficient to provide no less than three air changes per hour.
        a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
        b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
    2. During dust producing activities (e.g. drywall installation and finishing) turn ventilation system off, and opening in supply and return HVA system shall be protected from dust infiltration. Provide temporary ventilation as required.
    3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days t allow for reasonable dissipation of odors and emissions prior to delivery to Project site.
        a. Condition products without containers and packaging to maximize off –gassing of VOCs

b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for considerations of other locations.

D. Protection:
   1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose. Take special care to prevent accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging on products.
      a. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
      b. Replace moldy materials with, new, undamaged materials.
   2. Ducts: Seal ducts during transportation, deliver, and constructions to prevent accumulation of construction dust and construction debris inside ducts.

1.6 SEQUENCING

A. Environmental Issues:
   1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
   2. Complete interior finish material installation no less than fourteen (14) days prior to Substantial Completion to allow for building flush out.

PART 2 – PRODUCTS

2.1 CHEMICALS OF CONCERN

A. Chemicals of Concern are those chemicals listed below as toxic air contaminants, carcinogens, teratogens, reproductive toxins, and chemicals with established Chronic Reference Exposure Levels (REL) :
B. Carcinogens: Chemicals listed as probable or known human carcinogens in the latest published edition of the California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA), Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).
C. Reproductive Toxicants: Chemicals known to cause reproductive toxicity including birth defects or other reproductive harm in the latest published edition of the following list: California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA), Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).
D. Chemicals with established Chronic Reference Exposure Levels (REL): Chronic RELs have been developed for 65 hazardous airborne substances as of January 2001. A chronic REL is an airborne concentration level that would pose no significant health risk to individuals indefinitely exposed to that level. RELs are based solely on

health considerations, and are developed from the best available data in the scientific literature. The California environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA) establishes and publishes RELs.

2.2 SUBSTITUTIONS

A. Substitutions Environmental Issues: Requests for substitutions shall comply with requirements specified in Section 01 25 13 – Product Substitutions, with following additional information required where environmental issues are specified.
   1. Indicate each proposed substitution complies with requirements for VOCs.
   2. Owner, in consultation with Architect reserve right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for specified materials.
   3. Comply with specified recycled content and other environmental requirements.

PART 3 – EXECUTION

3.1 FILED QUALITY CONTROL

A. Building Flush Out: Just prior to Substantial Completion, flush out building continuously (i.e. 24 hours per day, seven (7) days a week) using maximum tempered outside air (or maximum amount of outside air while achieving reasonable indoor temperature) for at least fourteen (14) calendar days. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly.

   1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of four (4) days after touch-up installation with maximum tempered outside air for 24 hr per day.
   2. If construction schedule permits, extend flush-out period to minimize energy consumption.

3.2 CLEANING

A. Final Cleaning Environmental Issues:
   1. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products as described in Part 1 of this section.
   2. Clean equipment and fixture to sanitary condition using cleaning and maintenance products as described in Part 1 of this Section.
   3. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.

4. If ducts were not sealed ruing construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. However, ducts shall be inspected to confirm that no oil film is present. Remove oil.
5. Replace all air filters (i.e. , pre and final filters) just prior to Substantial Completion.
6. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01565 – Site Waste Management Program

3.3 PROTECTION

A. Environmental Issues:
    1. Protect interior materials from water intrusion or penetration; where interior products not intended for wet applications are exposed to moisture, immediately removed from site and dispose of properly.
    2. Protect installed products using methods that do not support growth of molds and mildews.
        a. Immediately remove from site materials with mold and materials with mildew.

END OF SECTION 01 62 35

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for the following:

1. Salvaging non-hazardous construction waste
2. Recycling non-hazardous construction waste
3. Disposing of non-hazardous construction waste

B. Related Sections include the following:

1. Section 01 62 05 – Environmental Performing Construction Products
2. Section 01 62 35 – Special Environmental Requirements

1.3 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, paint, or the like.

B. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

C. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations

D. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction

E. Diversion: Avoidance of demolition and construction waste sent to landfill or incineration. Diversion does not include using materials for landfill, alternate daily cover on landfills, or materials used as fuel in waste-to-energy processes

F. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitability, corrosiveness, toxicity or reactivity

G. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse

H. Recycling: The process of sorting, cleansing, treating, and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Salvage: Recovery of demolition or construction waste and subsequent reuse or sale in another facility

J. Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work

K. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste

L. Toxic: Poisonous to humans either immediately or after a long period of exposure

M. Trash: Any product or material unable to be reused, returned, recycled, or salvaged

N. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.4 PERFORMANCE REQUIREMENTS

A. The Owner has established that this Project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors shall be employed.

B. Of the waste that is generated, as many of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills or incinerators shall be minimized, thereby reducing disposal costs.

C. Develop a construction waste management plan that results in end-of-Project rates for salvage/recycling of 25% (by weight) of construction and demolition waste.

D. Salvage/Recycle Requirements: Salvage and recycle as much non-hazardous demolition and construction waste as possible, including the following materials:

1. Construction Waste:
    a. Masonry and CMU
    b. Metals
    c. Insulation
    d. Carpet and pad
    e. Acoustical ceiling material
    f. Unused (leftover) paint
    g. Piping
    h. Electrical conduit
    i. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
        1) Paper
        2) Cardboard
        3) Boxes
        4) Plastic sheet and film
        5) Polystyrene packaging
        6) Wood crates
        7) Plastic pails

j. Beverage and packaged food containers

1.5 SUBMITTALS

A. Construction Waste Management Plan (CWMP): It is the intent of this specification to maximize the diversion of demolition and construction waste from landfill disposal. Accordingly, not more than 30 days after receipt of Notice to Proceed and prior to the generation of any waste, prepare and submit a draft Construction Waste Management Plan in accordance with Section 01 74 19 including, but not limited to, the following:

1. Procedures for Recycling/Reuse Program to divert a minimum of 25% (by weight) of construction and demolition waste from landfill disposal, including waste resulting from demolition of any existing building and site paving scheduled for demolition; any site paving is required to be ground on site and reused as granulated fill on site.

2. Approval of the Contractor's CWMP shall not relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures.

B. Submit a 3-ring binder with calculations on end-of-project recycling rates, salvage rates, and landfill rates itemized by waste material, demonstrating that a minimum of 25% of construction wastes were recycled or salvaged and diverted from landfill. Include documentation of recovery rate (if commingled), waste hauling certificates or receipts, and a brief narrative explaining how and to where each waste type has been diverted.

C. Construction Waste Management Plan: Submit four copies of plan within 45 days of date established for the Notice to Proceed.

D. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit four copies of report. Include separate reports for demolition and construction waste. Include the following information:

1. Material category
2. Generation point of waste
3. Total quantity of waste in tons
4. Quantity of waste salvaged, both estimated and actual in tons
5. Quantity of waste recycled, both estimated and actual in tons
6. Total quantity of waste recovered (salvaged plus recycled) in tons
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste
8. Include up-to-date records of donations, sales, recycling and landfill/incinerator manifests, weight tickets, hauling receipts, and invoices.

E. Waste Reduction Calculations: Before request for Substantial Completion, submit four copies of calculated end-of-project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work. Complete a table similar to the example below.

Recycled/Salvaged/Diverted Materials	Hauler or Location	Quantity of Material (tons)
Total Construction Waste Diverted		
Landfilled Materials		
Total Construction Waste Landfilled		

Total Construction Waste		Total Construction Waste Diverted + Total Construction Waste Landfilled
Percentage of Construction Waste Diverted from Landfill		(Total Construction Waste Diverted / Total Construction Waste)*100

F. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax-exempt.

G. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax-exempt.

H. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

I. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills (or transfer stations) and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with all applicable local ordinances and regulations.

B. Waste Management Meetings: Conduct an initial conference at Project Site to comply with requirements in Division 1 Section “Coordination.” Contractor shall include discussions on construction waste management requirements in the pre-construction meeting. Contractor shall include discussions on construction waste management requirements in the regular job meetings conducted during the course of the Project; at these meetings, review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of the Waste Management Coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.7 CONSTRUCTION WASTE MANAGEMENT PLAN

A. General: Develop and implement a CWMP consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Include separate sections in plan for demolition and construction waste. Indicate quantities by weight or volume, but use the same units of measure throughout the CWMP.

B. Draft Construction Waste Management Plan: Within 30 days after receipt of Notice to Proceed, or prior to any waste removal, whichever occurs sooner, the Contractor shall submit to the Owner and Architect a Draft Waste Management Plan.

C. Final Construction Waste Management Plan: Once the Owner has determined which of the recycling options addressed in the draft Waste Management Plan are acceptable, the Contractor shall submit, within 10 calendar days, a Final Waste Management Plan.

D. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

E. Landfill Options: Indicate the name of the landfill(s) and/or transfer station(s) and/or incinerator(s) where trash will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all Project waste in the landfill(s).

F. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, reused, recycled, or disposed of in landfill or incinerator. Include points of

waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Describe method that will be used for separating recyclable waste, including sizes of containers, container labeling, and designated location on Project Site where materials separation will be located.

G. Materials: The following list of required materials, at a minimum, must be included for salvaging/recycling:

1. Cardboard
2. Clean dimensional wood
3. Beverage and food containers
4. Paper
5. Concrete
6. Concrete Masonry Units (CMUs
7. Ferrous and non-ferrous metals (banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze)
8. Stretch and shrink wrap
9. Paint containers and other clean, empty plastic containers

H. Meetings: Provide a description of the regular meetings to be held to address waste management.

I. Materials Handling Procedures: Provide a description of the means by which any waste materials identified will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.

J. Transportation: Provide a description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site) and destination of materials.

1.8 CONSTRUCTION WASTE MANAGEMENT RESOURCES

A. General information contacts regarding construction and demolition waste:

1. EPA Construction and demolition (C&D) debris website: http://www.epa.gov/epaoswer/non-hw/debris-new/bytype.htm
2. Directory of Wood-Framed Building Decontruction and Reused Building Materials Companies: http://www.fpl.fs.fed.us/documnts/fplgtr/fpl_gtr150.pdf
3. Additional resources to be developed by Contractor with assistance from Owner and Architect, as requested.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Architect and Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Waste Management Coordination: Site Superintendent and/or General Contractor's site representative should coordinate waste management and be responsible for implementing, monitoring, and reporting status of waste management work plan. He or she shall be present at the Project Site on a full-time for duration of Project.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project Site.

1. Distribute waste management plan to everyone concerned within three days of submittal return.

2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project Site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

2. Recycling and waste bin areas are to be kept neat, and clean, and clearly marked in order to avoid contamination of materials.

3. Comply with Division 1 Section “Temporary Facilities and Controls” for controlling dust and dirt, environmental protection, and noise control.

E. Hazardous Wastes: Hazardous wastes shall be separated, stored, and disposed of according to local regulations and should not be included in Construction Waste Management Plan’s calculations of waste.

3.2 RECYCLING CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Receivers and Processors: List below is provided for information only; available recycling receivers and processors include, but are not limited to, the following:

1. Metal
   a) Products.Lopez Scrap Metal Inc 351 N. Nevarez Road, El Paso, TX 79927 915-859-0770
   b) Gandaras Recycling 10721 North Loop Drive, Socorro, TX 79927 915-860-9596
   c) Haro Armando 11369 Alameda Ave, Socorro, TX 79927 915-851-2028
   d) Lucero Scrap 10717 Alameda Avenue, Socorro, TX 79927 915-872-9880
   e) M & M Metal Inc 12751 Pellicano Drive, El Paso, TX 79928 915-852-2080
   f) Lawson Recycling 1125 Loma Verde Drive, El Paso, TX 79936 915-858-2274
   g) Smart Recycling 11777 Gateway Boulevard West, El Paso, TX 79936 915-852-1445
   h) Asa Recycling LLC 1042 Eastside Road, El Paso, TX 79915 915-779-3326
   i) Metal Recycling Company 2505 Texas Avenue, El Paso, TX 79901 915-544-9890
2. Cardboard and Paper
   a) JP IND 8650 Yermoland Drive, El Paso, TX 79907 915-590-5094
   b) NCED 11540 Pellicano Dr, El Paso, TX 79936 915-594-1471
3. Plastics

a) Alpha Recycling, 6807 Industrial Avenue, El Paso, TX 79915 915-313-0333

b) Metal Recycling Co., 2505 Texas Avenue, El Paso, TX 79901 915-544-9890

4. Concrete Products:

a) Jobe Materials

C. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project Site to the maximum extent practical.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.

a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.

4. Store components off the ground and protect from the weather.

5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.3 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood if possible. Other options may be to donate pallets to individuals or organizations.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood if possible.

B. Site-Clearing Wastes: Chip brush, branches, and trees on-site if possible.

C. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into material appropriate for mulch or erosion control if possible.

2. Lumber Treated with Heavy-Metal Preservatives: Do not grind, chip, or incinerate; must be reused or landfilled.

D. Miscellaneous: Anything called out to be ground and used on site should utilize an on-site grinder.

1. Grinder should be able to accommodate a variety of materials including masonry, asphalt shingles, wood, and drywall.

3.4 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise re-used, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Do not burn or bury waste materials on or off site. Appropriate on-site topical application of ground gypsum or wood, or use of site paving as granulated fill is considered reuse, not waste.

END OF SECTION 01 74 19

SECTION 09 65 19 - LINOLEUM COMPOSITION TILE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: linoleum composition tile flooring.
   1. Homogeneous linoleum floor tile, full spread adhesive method installation, finish
   2. Homogeneous linoleum floor tile, full spread adhesive method and seamless installation, finish

B. Related Sections: Section(s) related to this section include:
   1. Concrete: Refer to Division 3 Concrete Sections for cast-in-place concrete, concrete toppings, and cementitious underlayments.
   2. Resilient Flooring Accessories: Refer to Division 9 Finishes Sections for resilient wall bases, reducer strips, metal edge strips and other resilient flooring accessories.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM E 648-88 Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source.
   2. ASTM E 662-83 Test Method for Specific Density of Smoke Generated by Solid Materials.
   3. ASTM F 710-86 Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.
   4. ASTM F 970-87 Test Method for Static Load Limit.

B. Federal Specification (Fed Spec):
   1. Fed Spec SS-T-312B Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl Asbestos, 10 Oct 74.

C. National Fire Protection Association (NFPA):
   1. NFPA 253-1984 Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source.
   2. NFPA 258-1989 Test Method for Specific Density of Smoke Generated by Solid Materials.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements: Provide flooring which has been manufactured, fabricated and installed to performance criteria certified by manufacturer without defects, damage, or failure.

1.04 SUBMITTALS

A. General: Submit listed submittals in accordance with Division 1 Submittal Procedures Section.

B. Product Data: Submit product data, including manufacturer's SPEC-DATA product sheet, for

specified products.

D. Samples: Submit selection and verification samples for finishes, colors, and textures.

E. Quality Assurance Submittals: Submit the following:
   1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
   2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements.
   3. Manufacturer's Instructions: Manufacturer's installation instructions.

F. Closeout Submittals: Submit the following:
   1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
   2. Warranty: Warranty documents specified herein.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Installer experienced and certified in performing work of this section who has specialized in installation of work similar to that required for this project.

B. Regulatory Requirements:
   1. Fire Performance Characteristics: Provide resilient linoleum tile flooring with the following fire performance characteristics as determined by testing products in accordance with ASTM method indicated below by a certified testing laboratory or another testing and inspecting agency acceptable to authorities having jurisdiction:
      a. Critical Radiant Flux: Class 1 Rating per NFPA 253 (ASTM 648) (0.45 watts/cm² or greater).
      b. Smoke Density: Less than 450 per NFPA 258 (ASTM E 662).

D. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements. Comply with Division 1 Coordination (Project Meetings) Section.

1.06 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with Division 1 Product Requirements Sections.

B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.

1. Material should be stored in areas that are fully enclosed, weathertight with the permanent HVAC system set at a uniform temperature of at least 68 degrees F (20 degrees C) for 72 hrs. prior to, during and after installation.

1.07 PROJECT CONDITIONS

A. Environmental Requirements/Conditions: In accordance with manufacturer's recommendations, Areas to receive flooring shall be clean, fully enclosed, weathertight with the permanent HVAC set at a uniform temperature of at least 68 degrees F. The flooring material should be conditioned in the same manner. Maximum temperature should not exceed 100 degrees F after installation.

B. Temperature Requirements: Maintain air temperature in spaces where products will be installed for time period before, during, and after installation as recommended by manufacturer.
   1. Temperature Conditions: 68 degrees F (20 degrees C) for 72 hours prior to, during and after installation.

C. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.08 SEQUENCING AND SCHEDULING

A. Finishing Operations: Install tile flooring after finishing operations, including painting and ceiling operations, have been completed.

B. Concrete Curing: Do not install tile flooring over concrete substrates until substrates have cured and are dry to bond with adhesive as determined by resilient flooring manufacturer's recommended bond, moisture test, and pH test.

1.09 WARRANTY

A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

   1. Warranty Period: Five (5) year limited warranty commencing on Date of Substantial Completion.

1.10 MAINTENANCE

A. Extra Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals (Maintenance Materials) Section.

   1. Quantity: Furnish quantity of flooring units equal to 5% of amount installed.

PART 2 - PRODUCTS

2.01 RESILIENT LINOLEUM TILE FLOORING

A. Manufacturers, including but not limited to:

1. Forbo Linoleum, Inc.
2. Armstrong

B. Products: Equivalent to Marmoleum Dual Linoleum Tile and Linoleum Tile Adhesive.
1. Description: Homogeneous tile of primarily natural materials consisting of linseed oil, wood flour, and rosin binders, mixed and calendered onto a polyester backing. Pattern and color shall extend throughout total thickness of tile material.
2. Size: 13" x 13" approx.
3. Gauge: 1/10" (2.5 MM).
4. Backing: Polyester backing.
5. Pattern(s) and Color(s): As selected by Architect from manufacturers standard patterns and colors.
6. Adhesive: Forbo Linoleum, Inc., L910 adhesive or equal.
7. Topshield™ finish

C. Product Criteria Forms: Refer to Product Criteria Forms as an attachment to this section.
1. Product Forms: Subject to compliance with specified requirements, provide products specified in each Product Data Sheet at end of this section.

2.02 RELATED MATERIALS

A. Related Materials: Refer to other sections for related materials as follows:
1. Underlayment and Patching Compound: Refer to Division 3 Concrete Sections for portland cement-based underlayments and patching compounds.
2. Resilient Flooring Accessories: Refer to Division 9 Finishes Sections for resilient flooring accessories.
3. Expansion Joint Covers: Refer to other specification section for expansion joint covers to be used with resilient flooring.

2.03 SOURCE QUALITY

A. Source Quality: Obtain flooring product materials from a single manufacturer.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions for installation.

3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions (which have been previously

installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions.

B. Material Inspection: In accordance with manufacturer's installation requirements, visually inspect materials prior to installation. Material with visual defects shall not be installed and shall not be considered as a legitimate claim.

3.03 PREPARATION

A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

B. Surface Preparation:
   1. General: Prepare floor substrate in accordance with manufacturer's instructions.
   2. Floor Substrate: Prepare floor substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as dust, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue.
   3. Concrete Floor Substrate: Concrete floor substrate shall have a minimum compressive strength of 3000 psi. Refer to Division 3 Concrete sections for patching and repairing crack materials, and leveling compounds with portland cement-based compounds. Do not use or install flooring over gypsum-based leveling or patching materials.
      a. Reference Standard: Comply with ASTM F 710 Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.

C. Concrete Moisture Test: Perform moisture tests on concrete floors regardless of the age or grade level with a minimum of three tests for the first 1000 square feet. The test shall be a calcium chloride test. One test shall be conducted for every 1000 sq. ft. of flooring. The test shall be conducted around the perimeter of the room, at columns and where moisture may be evident. The moisture emission from the concrete shall not exceed 5.0 lbs. per 1000 sq. ft. in 24 hrs. For the most accurate results, the weight of the calcium chloride dish shall be made on the job site at the start and end of each test. A diagram of the area showing the location and results of each test shall be submitted to the architect, general contractor or end user. If the test results exceed the limitations, the installation shall not proceed until the problem has been corrected.

D. Concrete pH Test: Perform pH tests on concrete floors regardless of the age or grade level. If the pH is greater than 10, it must be neutralized prior to beginning the installation.

3.04 INSTALLATION

A. Full Spread Adhesive Method Installation: Install tile flooring with full spread adhesive method from established area center marks, in order for tile at opposite edges of area to be of equal width. Avoid using cut tile widths at perimeter less than four inches of tile width. Install tiles square with room axis. Lay tile material into wet adhesive, as recommended by tile manufacturer.

   1. Adhesive Material Installation: Use trowel as recommended by flooring manufacturer for specific type of adhesive. Spread at a rate of approximately 150 sq. ft./gal. as recommended by flooring manufacturer.

B. Installation Techniques:
   1. Where demountable partitions and other items are indicated for installation on top of finished flooring, install flooring before these items are installed.
   2. Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures and built-in furniture, including pipes, outlets, edgings, thresholds, nosings, and cabinets.
   3. Extend flooring into toe spaces, door reveals, closets, and similar openings.
   4. Install flooring on covers for telephone and electrical ducts, and similar items occurring within finish floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on covers.
   5. Do not install resilient flooring over expansion joints. Use expansion joint covers manufactured for use with resilient flooring. Refer to other specifications sections for expansion joint covers.
   6. Adhere resilient flooring to flooring substrate without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed flooring installation.
      a. Use adhesive applied to substrate in compliance with flooring manufacturer’s recommendations, including those for trowel notching, adhesive mixing, and adhesive open and working times.

C. Finish Flooring Patterns: As selected by Architect.

3.05 FIELD QUALITY REQUIREMENTS

A. Manufacturer's Field Services: Upon Owner's request and with at least 72 hours notice, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.

3.06 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.
   1. Remove visible adhesive and other surface blemishes using cleaning methods recommended by tile floor manufacturer.
   2. Sweep and vacuum floor after installation.
   3. Do not wash floor until after time period recommended by tile flooring manufacturer.
   4. Damp-mop tile flooring to remove black marks and soil.

3.07 PROTECTION

A. Protection: Protect installed product and finish surfaces from damage during construction. Remove and legally dispose of protective covering at time of Substantial Completion.

END OF SECTION 09 65 19

SAMPLE PRODUCT DATA SHEET

Project Name: Ysleta Annex County of El Paso
Project Number: 070210

Linoleum Composition Tile Product Data Sheet

Manufacturer/Product:
Manufacturer: Forbo Linoleum, Inc.
Product: Marmoleum Dual Linoleum Tile

Composition: Homogeneous, natural material with color and pattern throughout total thickness of entire tile material.

Gauge (Thickness): 1/10 inch (2.5 MM)

Size: 13 inches x 13 inches approx. (33 cm x 33 cm)

Slip Resistance: .6 for flat surfaces, for compliance with Americans with Disabilities Act (ADA) of 1990 per manufacturer's testing criteria.

Fire Resistance:
Smoke Density: 450 or less (ASTM E 662/NFPA 258)
Critical Radiant Flux: Class 1 Rating (ASTM E 648/NFPA 253)

Color and Pattern: As selected by Architect from manufacturer's full range of colors and patterns.

END OF DATA SHEET

SECTION 270500 - COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Communications equipment coordination and installation.
2. Sleeves for pathways and cables.
3. Sleeve seals.
4. Grout.
5. Common communications installation requirements.

1.3 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Product Data: For sleeve seals.

1.5 COORDINATION

A. Coordinate arrangement, mounting, and support of communications equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting pathways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for communications items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."."

PART 2 - PRODUCTS

2.1 SLEEVES FOR PATHWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Sleeves for Rectangular Openings: Galvanized sheet steel.

1. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).

b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR COMMUNICATIONS INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Communications penetrations occur when pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Extend sleeves installed in floors [**2 inches (50 mm)** above finished floor level.

G. Size pipe sleeves to provide [**1/4-inch (6.4-mm)** annular clear space between sleeve and pathway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants.".

J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pathway and cable penetrations. Install sleeves and seal pathway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."

K. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using [**steel**] [**cast-iron**] pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between pathway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for communications installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION 270500

SECTION 271100 - COMMUNICATIONS EQUIPMENT ROOM FITTINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Telecommunications mounting elements.
2. Backboards.
3. Telecommunications equipment racks and cabinets.
4. Telecommunications service entrance pathways.
5. Grounding.

B. Related Sections:

1. Division 27 Section "Communications Backbone Cabling" for voice and data cabling associated with system panels and devices.
2. Division 27 Section "Communications Horizontal Cabling" for voice and data cabling associated with system panels and devices.

1.3 DEFINITIONS

A. BICSI: Building Industry Consulting Service International.

B. LAN: Local area network.

C. RCDD: Registered Communications Distribution Designer.

1.4 PERFORMANCE REQUIREMENTS

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified **and the unit will be fully operational after the seismic event**."

1.5 SUBMITTALS

A. Shop Drawings: For communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.
3. Grounding: Indicate location of grounding bus bar and its mounting detail showing standoff insulators and wall mounting brackets.

B. Qualification Data: For **Installer ,**qualified layout technician, installation supervisor, and field inspector.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of Shop Drawings shall be under the direct supervision of **RCDD**
2. Installation Supervision: Installation shall be under the direct supervision of **Registered Technician** who shall be present at all times when Work of this Section is performed at Project site.
3. Field Inspector: Currently registered by BICSI as **RCDD** to perform the on-site inspection.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.

D. Grounding: Comply with ANSI-J-STD-607-A.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install equipment frames and cable trays until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and work above ceilings is complete.

1.8 COORDINATION

A. Coordinate layout and installation of communications equipment with Owner's telecommunications and LAN equipment technology department. Coordinate service entrance arrangement with local exchange carrier.

1. Meet jointly with telecommunications and LAN equipment technology department, local exchange carrier representatives, and supervisors to exchange information and agree on details of equipment arrangements and installation interfaces.
2. Record agreements reached in meetings and distribute them to other participants.

3. Adjust arrangements and locations of distribution frames, cross-connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.
4. Adjust arrangements and locations of equipment with distribution frames, cross-connects, and patch panels of cabling systems of other communications, electronic safety and security, and related systems that share space in the equipment room.

B. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

PART 2 - PRODUCTS

2.1 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A.

B. Cable Support: NRTL labeled. Cable support brackets shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Cable tie slots fasten cable ties to brackets.

1. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.
2. Support brackets with cable tie slots for fastening cable ties to brackets.
3. Lacing bars, spools, J-hooks, and D-rings.
4. Straps and other devices.

C. Cable Trays:

1. Cable Tray Materials: Metal, suitable for indoors and protected against corrosion by **electroplated zinc galvanizing.**

D. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems." **Flexible metal conduit shall not be used**.

1. Outlet boxes shall be no smaller than 2 inches (50 mm) wide, 3 inches (75 mm) high, and 2-1/2 inches (64 mm) deep.

2.2 BACKBOARDS

A. Backboards: Plywood, **fire-retardant treated,** 3/4 by 48 by 96 inches (19 by 1220 by 2440 mm). Comply with requirements for plywood backing panels specified in Division 06 Section "Rough Carpentry."

2.3 EQUIPMENT FRAMES

A. Manufacturers: Subject to compliance with requirements, **provide products by one of the following**.
1. Cooper B-Line, Inc.

2. Hubbell Premise Wiring.
3. Leviton Voice & Data Division.
4. Panduit Corp.

B. General Frame Requirements:

1. Distribution Frames: Freestanding and wall-mounting, modular-steel units designed for telecommunications terminal support and coordinated with dimensions of units to be supported.
2. Module Dimension: Width compatible with EIA 310 standard, 19-inch (480-mm) panel mounting.
3. Finish: Manufacturer's standard, baked-polyester powder coat.

C. Floor-Mounted Racks: Modular-type,**steel** construction.

1. Vertical and horizontal cable management channels, top and bottom cable troughs, grounding lug.
2. Baked-polyester powder coat finish.

D. Modular Freestanding Cabinets:

1. Removable and lockable side panels.
2. Hinged and lockable front and rear doors.
3. Adjustable feet for leveling.
4. Screened ventilation openings in the roof and rear door.
5. Cable access provisions in the roof and base.
6. Grounding bus bar.
7. **Rack**-mounted, 550-cfm (260-L/s) fan with filter.
8. Power strip.
9. Baked-polyester powder coat finish.
10. All cabinets keyed alike.

E. Cable Management for Equipment Frames:

1. Metal, with integral wire retaining fingers.
2. Baked-polyester powder coat finish.
3. Vertical cable management panels shall have front and rear channels, with covers.
4. Provide horizontal crossover cable manager at the top of each relay rack, with a minimum height of two rack units each.

2.4 POWER STRIPS

A. Power Strips: Comply with UL 1363.

1. Rack mounting.
2. **Six**, **20-A, 120-V ac, NEMA WD 6, Configuration 5-20R** receptacles.
3. LED indicator lights for power and protection status.
4. LED indicator lights for reverse polarity and open outlet ground.

5. Protection modes shall be line to neutral, line to ground, and neutral to ground. UL 1449 clamping voltage for all 3 modes shall be not more than **330 V**.

2.5 GROUNDING

A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems." for grounding conductors and connectors.

B. Telecommunications Main Bus Bar:

1. Connectors: Mechanical type, cast silicon bronze, solderless **compression** -type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
2. Ground Bus Bar: Copper, minimum 1/4 inch thick by 4 inches wide (6 mm thick by 100 mm wide) with 9/32-inch (7.14-mm) holes spaced 1-1/8 inches (28 mm) apart.
3. Stand-Off Insulators: Comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

C. Comply with ANSI-J-STD-607-A.

2.6 LABELING

A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES

A. Contact telecommunications service provider and arrange for installation of demarcation point, protected entrance terminals, and a housing when so directed by service provider.

B. Install **underground** pathways complying with recommendations in TIA/EIA-569-A, "Entrance Facilities" Article.

C. Comply with NECA 1.

D. Comply with BICSI TDMM for layout and installation of communications equipment rooms.

E. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A-7.

F. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

3.2 FIRESTOPPING

A. Comply with requirements in Division 07 Section "Penetration Firestopping."Comply with TIA/EIA-569-A, Annex A, "Firestopping."

B. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.3 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

1. Bond the shield of shielded cable to the grounding bus bar in communications rooms and spaces.

3.4 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements in Division 26 Section "Identification for Electrical Systems."Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

B. See Division 27 Section "Communications Horizontal Cabling" for additional identification requirements. See Evaluations for discussion of TIA/EIA standard as it applies to this Section.Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for **Class 2**level of administration **including optional identification requirements of this standard**.

C. Labels shall be preprinted or computer-printed type.

END OF SECTION 271100

SECTION 271300 - COMMUNICATIONS BACKBONE CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. The building complex consists of a main MDF room in which the main communication and data system network is connected to the main service provider. From this room, individual 3" conduits with sweeping elbows will protect the 50/125 optical fiber cabling that will serve area IDF closets. These closets will house the patch panels and connecting blocks for the cat 6 voice and data cabling that will feed a multi-outlet/combo assembly consisting of 2 data and 2 voice jacks. The contractor is responsible for a complete and functional system.

B. Section Includes:

1. Pathways.
2. UTP cable.
3. **50/125**-micrometer, optical fiber cabling.
4. Cable connecting hardware, patch panels, and cross-connects.
5. Cabling identification products.

1.3 DEFINITIONS

A. BICSI: Building Industry Consulting Service International.

B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

C. EMI: Electromagnetic interference.

D. IDC: Insulation displacement connector.

E. LAN: Local area network.

F. RCDD: Registered Communications Distribution Designer.

G. UTP: Unshielded twisted pair.

1.4 BACKBONE CABLING DESCRIPTION

A. Backbone cabling system shall provide interconnections between communications equipment rooms, main terminal space, and entrance facilities in the telecommunications cabling system structure. Cabling system consists of backbone cables, intermediate and main cross-connects, mechanical terminations, and patch cords or jumpers used for backbone-to-backbone cross-connection.

B. Backbone cabling cross-connects may be located in communications equipment rooms or at entrance facilities. Bridged taps and splitters shall not be used as part of backbone cabling.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Backbone cabling system shall comply with transmission standards in TIA/EIA-568-B.1, when tested according to test procedures of this standard.

1.6 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
2. Cabling administration drawings and printouts.
3. Wiring diagrams to show typical wiring schematics including the following:

    a. Cross-connects.
    b. Patch panels.
    c. Patch cords.

4. Cross-connects and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.
5. Cable tray layout, showing cable tray route to scale, with relationship between the tray and adjacent structural, electrical, and mechanical elements. Include the following:

    a. Vertical and horizontal offsets and transitions.
    b. Clearances for access above and to side of cable trays.

    c. Load calculations to show dead and live loads as not exceeding manufacturer's rating for tray and its support elements.

C. Field quality-control reports.

D. Maintenance Data: For splices and connectors to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of Shop Drawings**, Cabling Administration Drawings, and field testing program development** by an RCDD.
2. Installation Supervision: Installation shall be under the direct supervision of **Registered Technician**, who shall be present at all times when Work of this Section is performed at Project site.
3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

B. Testing Agency Qualifications: An NRTL.

1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

C. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: **25**or less.
2. Smoke-Developed Index: **50** or less.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

E. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.

F. Grounding: Comply with ANSI-J-STD-607-A.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test optical fiber cable to determine the continuity of the strand end to end. Use **optical fiber flashlight or optical loss test set**
2. Test each pair of UTP cable for open and short circuits.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.10 COORDINATION

A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment technology department.

1.11 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Patch-Panel Units: **One** of each type.
2. Connecting Blocks: **One** of each type.

PART 2 - PRODUCTS

2.1 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A.

B. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.

1. Support brackets with cable tie slots for fastening cable ties to brackets.
2. Lacing bars, spools, J-hooks, and D-rings.
3. Straps and other devices.

C. Cable Trays:

1. Manufacturers: Subject to compliance with requirements,

a. Mono-systems, Inc.

D. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems." **Flexible metal conduit shall not be used.**

1. Outlet boxes shall be no smaller than 12 inches (50 mm) wide, 12 inches (75 mm) high, and 12 inches (64 mm) deep.

2.2 BACKBOARDS

A. Backboards: Plywood, **fire-retardant treated,** 3/4 by 48 by 96 inches (19 by 1220 by 2440 mm). Comply with requirements in Division 06 Section "Rough Carpentry" for plywood backing panels.

2.3 UTP CABLE

A. Manufacturers: Subject to compliance with requirements, **provide products by one of the following**,

1. Belden CDT Inc.; Electronics Division.
2. Genesis Cable Products; Honeywell International, Inc.
3. Mohawk; a division of Belden CDT.
4. 3M.

5. Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. Description: 100-ohm, 100 pair UTP, formed into 25-pair binder groups covered with a **gray** thermoplastic jacket **and overall metallic shield**.

1. Comply with ICEA S-90-661 for mechanical properties.
2. Comply with TIA/EIA-568-B.1 for performance specifications.
3. Comply with TIA/EIA-568-B.2, **Category 6**.
4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
   a. Communications, Plenum Rated: Type **MPP**, complying with NFPA 262.
   b. Multipurpose, Plenum Rated: Type MPP, complying with NFPA 262.

2.4 UTP CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, **provide products by one of the following**,

1. Hubbell Premise Wiring.
2. Leviton Voice & Data Division.
3. Panduit Corp.

B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

C. Connecting Blocks: **110-style IDC for Category 6** Provide blocks for the number of cables terminated on the block, plus **25** percent spare. Integral with connector bodies, including plugs and jacks where indicated.

D. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.

1. Number of Terminals per Field: **One** for each conductor in assigned cables.

E. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.

1. Number of Jacks per Field: One for each four-pair **conductor group of indicated cables, plus spares and blank positions adequate to suit specified expansion criteria**.

F. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.

G. Patch Cords: Factory-made, 4-pair cables in **48-inch (1200-mm)** lengths; terminated with 8-position modular plug at each end.

1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.

2.5 OPTICAL FIBER CABLE

A. Manufacturers: Subject to compliance with requirements, **provide products by one of the following**,

1. Corning Cable Systems.
2. Optical Connectivity Solutions Division; Emerson Network Power.
3. 3M.

B. Description: Multimode, **50/125**-micrometer, **24** fiber, **nonconductive,** tight buffer, optical fiber cable.

1. Comply with ICEA S-83-596 for mechanical properties.
2. Comply with TIA/EIA-568-B.3 for performance specifications.
3. Comply with **TIA/EIA-492AAAA-B** for detailed specifications.
   a. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262.

4. Conductive cable shall be **aluminum** armored type.
5. Maximum Attenuation: **3.50** > dB/km at 850 nm; **1.5** > dB/km at 1300 nm.
6. Minimum Modal Bandwidth: 160 MHz-km at 850 nm; 500 MHz-km at 1300 nm.

C. Jacket:

1. Jacket Color: **Aqua for 50/125-micrometer cable**.
2. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches (1000 mm).

2.6 OPTICAL FIBER CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, **provide products by one of the following**,

1. Corning Cable Systems.
2. Hubbell Premise Wiring.
3. Optical Connectivity Solutions Division; Emerson Network Power.

B. Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors.

1. Number of Connectors per Field: **One**for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to suit specified expansion criteria.

C. Patch Cords: Factory-made, dual-fiber cables in 36-inch (900-mm) lengths.

D. Cable Connecting Hardware:

1. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA/EIA-568-B.3.

2. Quick-connect, simplex and duplex, **Type LC** connectors. Insertion loss not more than 0.75 dB.
3. Type SFF connectors may be used in termination racks, panels, and equipment packages.

2.7 GROUNDING

A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems." for grounding conductors and connectors.

B. Comply with ANSI-J-STD-607-A.

2.8 IDENTIFICATION PRODUCTS

A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

2.9 SOURCE QUALITY CONTROL

A. Factory test cables on reels according to TIA/EIA-568-B.1.

B. Factory test UTP cables according to TIA/EIA-568-B.2.

C. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.

D. Cable will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES

A. Coordinate backbone cabling with the protectors and demarcation point provided by communications service provider.

3.2 WIRING METHODS

A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters **and except in accessible ceiling spaces, in attics, and in gypsum board partitions where unenclosed wiring method may be used**. Conceal raceway and cables except in unfinished spaces.

1. Install plenum cable in environmental air spaces, including plenum ceilings.
2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.3 INSTALLATION OF PATHWAYS

A. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A.

B. Comply with requirements for demarcation point, pathways, cabinets, and racks specified in Division 27 Section "Communications Equipment Room Fittings." Drawings indicate general arrangement of pathways and fittings.

C. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.

D. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.

E. Install manufactured conduit sweeps and long-radius elbows whenever possible.

F. Pathway Installation in Communications Equipment Rooms:

1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
2. Install cable trays to route cables if conduits cannot be located in these positions.
3. Secure conduits to backboard when entering room from overhead.
4. Extend conduits **3 inches (76 mm)** above finished floor.
5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

G. Backboards: Install backboards with 96-inch (2440-mm) dimension vertical. Butt adjacent sheets tightly, and form smooth gap-free corners and joints.

3.4 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Comply with TIA/EIA-568-B.1.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.

5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Use lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
10. In the communications equipment room, install a 10-foot- (3-m-) long service loop on each end of cable.
11. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

1. Comply with TIA/EIA-568-B.2.
2. Do not untwist UTP cables more than 1/2 inch (12 mm) from the point of termination to maintain cable geometry.

D. Optical Fiber Cable Installation:

1. Comply with TIA/EIA-568-B.3.
2. Cable may be terminated on connecting hardware that is rack or cabinet mounted.

E. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend UTP cable not in a wireway or pathway, a minimum of 8 inches (200 mm) above ceilings by cable supports not more than **60 inches (1524 mm)** apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

F. Group connecting hardware for cables into separate logical fields.

G. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA/EIA-569-A recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:

    a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches (127 mm).

b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches (300 mm).
c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches (610 mm).

3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:

a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches (64 mm).
b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches (150 mm).
c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches (300 mm).

4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:

a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches (76 mm).
c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches (150 mm).

5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches (1200 mm).
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches (127 mm).

3.5 FIRESTOPPING

A. Comply with requirements in Division 07 Section "Penetration Firestopping."Comply with TIA/EIA-569-A, Annex A, "Firestopping."

B. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.6 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.7 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

1. Administration Class: **1**.
2. Color-code cross-connect fields and apply colors to voice and data service backboards, connections, covers, and labels.

B. Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

C. See Division 27 Section "Communications Horizontal Cabling" for additional identification requirements. See Evaluations for discussion about TIA/EIA standard as it applies to this Section.Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for **Class 2** level of administration **including optional identification requirements of this standard**.

D. Comply with requirements in Division 27 Section "Communications Horizontal Cabling" for cable and asset management software.

E. Cable Schedule: Install in a prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.

F. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, **backbone pathways and cables, entrance pathways and cables,** terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors.

G. Cable and Wire Identification:

1. Label each cable within 4 inches (100 mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet (4.5 m).
4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

    a. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device with name and number of particular device as shown.

b. Label each unit and field within distribution racks and frames.

5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.

H. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA 606-A, for the following:

1. Cables use flexible vinyl or polyester that flexes as cables are bent.

3.8 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Visually inspect UTP and optical fiber jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-B.1.
2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
3. Test UTP copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.

a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

4. Optical Fiber Cable Tests:

a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
b. Link End-to-End Attenuation Tests:

1) Horizontal and multimode backbone link measurements: Test at 850 or 1300 nm in 1 direction according to TIA/EIA-526-14-A, Method B, One Reference Jumper.
2) Attenuation test results for backbone links shall be less than 2.0 dB. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-B.1.

C. Data for each measurement shall be documented. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

D. Remove and replace cabling where test results indicate that they do not comply with specified requirements.

E. End-to-end cabling will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION 271300

SECTION 271500 - COMMUNICATIONS HORIZONTAL CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. The building complex consists of a main MDF room in which the main communication and data system network is connected to the main service provider. From this room, individual 3" conduits with sweeping elbows will protect the 50/125 optical fiber cabling that will serve area IDF closets. These closets will house the patch panels and connecting blocks for the cat 6 voice and data cabling that will feed a multi-outlet/combo assembly consisting of 2 data and 2 voice jacks. The contractor is responsible for a complete and functional system.

B. Section Includes:

1. Pathways.
2. UTP cabling.
3. **50/125** micrometer, optical fiber cabling.
4. Coaxial cable.
5. Multiuser telecommunications outlet assemblies.
6. Cable connecting hardware, patch panels, and cross-connects.
7. Telecommunications outlet/connectors.
8. Cabling system identification products.
9. Cable management system.

C. Related Sections:

1. Division 27 Section "Communications Backbone Cabling" for voice and data cabling associated with system panels and devices.
2. Division 28 Section "Conductors and Cables for Electronic Safety and Security" for voice and data cabling associated with system panels and devices.

1.3 DEFINITIONS

A. Basket Cable Tray: A fabricated structure consisting of wire mesh bottom and side rails.

B. BICSI: Building Industry Consulting Service International.

C. Consolidation Point: A location for interconnection between horizontal cables extending from building pathways and horizontal cables extending into furniture pathways.

D. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

E. EMI: Electromagnetic interference.

F. IDC: Insulation displacement connector.

G. LAN: Local area network.

H. MUTOA: Multiuser telecommunications outlet assembly, a grouping in one location of several telecommunications outlet/connectors.

I. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.

J. RCDD: Registered Communications Distribution Designer.

K. UTP: Unshielded twisted pair.

1.4 HORIZONTAL CABLING DESCRIPTION

A. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.

1. TIA/EIA-568-B.1 requires that a minimum of two telecommunications outlet/connectors be installed for each work area.
2. Horizontal cabling shall contain no more that one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
3. Bridged taps and splices shall not be installed in the horizontal cabling.
4. Splitters shall not be installed as part of the optical fiber cabling.

B. The maximum allowable horizontal cable length is 295 feet (90 m). This maximum allowable length does not include an allowance for the length of 16 feet (4.9 m) to the workstation equipment. The maximum allowable length does not include an allowance for the length of 16 feet (4.9 m) in the horizontal cross-connect.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-B.1, when tested according to test procedures of this standard.

1.6 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
2. Cabling administration drawings and printouts.
3. Wiring diagrams to show typical wiring schematics, including the following:

    a. Cross-connects.
    b. Patch panels.
    c. Patch cords.

4. Cross-connects and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.
5. Cable tray layout, showing cable tray route to scale, with relationship between the tray and adjacent structural, electrical, and mechanical elements. Include the following:

    a. Vertical and horizontal offsets and transitions.
    b. Clearances for access above and to side of cable trays.
    c. Vertical elevation of cable trays above the floor or bottom of ceiling structure.
    d. Load calculations to show dead and live loads as not exceeding manufacturer's rating for tray and its support elements.

C. Qualification Data: For **Installer,** qualified layout technician, installation supervisor, and field inspector.

D. Source quality-control reports.

E. Field quality-control reports.

F. Maintenance Data: For splices and connectors to include in maintenance manuals.

G. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of Shop Drawings **and Cabling Administration Drawings** by an RCDD.
2. Installation Supervision: Installation shall be under the direct supervision of **Registered Technician**, who shall be present at all times when Work of this Section is performed at Project site.
3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

4. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: **25** or less.
2. Smoke-Developed Index: **50** or less.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.

E. Grounding: Comply with ANSI-J-STD-607-A.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test optical fiber cables to determine the continuity of the strand end to end. Use [**optical fiber flashlight or optical loss test set**.
2. Test optical fiber cables while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector; including the loss value of each. Retain test data and include the record in maintenance data.
3. Test each pair of UTP cable for open and short circuits.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.10 COORDINATION

A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

C. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Patch-Panel Units: **One** of each type.
2. Connecting Blocks: of each type.
3. Device Plates: **One** of each type.

4. Multiuser Telecommunications Outlet Assemblies: **One** > of each type.

PART 2 - PRODUCTS

2.1 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A.

B. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.

1. Support brackets with cable tie slots for fastening cable ties to brackets.
2. Lacing bars, spools, J-hooks, and D-rings.
3. Straps and other devices.

C. Cable Trays:

1. Manufacturers: Subject to compliance with requirements, [**provide products by one of the following**] [**available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**]:

a. Mono-systems, Inc.

2. Cable Tray Materials: Metal, suitable for indoors, and protected against corrosion by **electroplated zinc galvanized.**

2.2 BACKBOARDS

A. Backboards: Plywood, **fire-retardant treated,**3/4 by 48 by 96 inches (19 by 1220 by 2440 mm). Comply with requirements in Division 06 Section "Rough Carpentry" for plywood backing panels.

2.3 UTP CABLE

A. Manufacturers: Subject to compliance with requirements, [**provide products by one of the following**] [**available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**]:

1. Belden CDT Inc.; Electronics Division.
2. 3M.

B. Description: 100-ohm, 4-pair UTP, formed into 25-pair, binder groups covered with a blue thermoplastic jacket.

1. Comply with ICEA S-90-661 for mechanical properties.
2. Comply with TIA/EIA-568-B.1 for performance specifications.
3. Comply with TIA/EIA-568-B.2, **Category 6**.

4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
   a. Communications, Plenum Rated: Type CMP[**or MPP**], complying with NFPA 262.
   b. Multipurpose, Plenum Rated: Type MPP, complying with NFPA 262.

2.4 UTP CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, [**provide products by one of the following**,

1. Hubbell Premise Wiring.
2. Leviton Voice & Data Division.
3. Panduit Corp.

B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

C. Connecting Blocks: **110-style IDC for Category 6**. Provide blocks for the number of cables terminated on the block, plus **25** percent spare. Integral with connector bodies, including plugs and jacks where indicated.

D. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.

1. Number of Terminals per Field: **One** for each conductor in assigned cables.

E. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.

1. Number of Jacks per Field: **One** for each four-pair **conductor group of indicated cables, plus spares and blank positions adequate to suit specified expansion criteria**.

F. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.

G. Patch Cords: Factory-made, four-pair cables in **48-inch (1200-mm)**lengths; terminated with eight-position modular plug at each end.

1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.

2.5 OPTICAL FIBER CABLE

A. Manufacturers: Subject to compliance with requirements, [**provide products by one of the following**,

1. Corning Cable Systems.
2. Optical Connectivity Solutions Division; Emerson Network Power.
3. 3M.

B. Description: Multimode, **50/125**micrometer, **24**-fiber, **nonconductive,** tight buffer, optical fiber cable.

1. Comply with ICEA S-83-596 for mechanical properties.
2. Comply with TIA/EIA-568-B.3 for performance specifications.
3. Comply with [**TIA/EIA-492AAAA-B**] [**TIA/EIA-492AAAA-A**] for detailed specifications.
   a. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262.
4. Conductive cable shall be **aluminum** armored type.
5. Maximum Attenuation: **3.50** > dB/km at 850 nm; **1.5** dB/km at 1300 nm.
6. Minimum Modal Bandwidth: 160 MHz-km at 850 nm; 500 MHz-km at 1300 nm.

C. Jacket:

1. Jacket Color: **Aqua for 50/125-micrometer cable** .
2. Cable cordage jacket, fiber, unit, and group color shall be according to TIA/EIA-598-B.
3. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches (1000 mm).

2.6 OPTICAL FIBER CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, **provide products by one of the following**,

B.
1. Corning Cable Systems.
2. Hubbell Premise Wiring.

C. Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors.

1. Number of Connectors per Field: **One** for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to suit specified expansion criteria.

D. Patch Cords: Factory-made, dual-fiber cables in 36-inch (900-mm) lengths.

E. Cable Connecting Hardware:

1. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA/EIA-568-B.3.
2. Quick-connect, simplex and duplex, **Type LC** connectors. Insertion loss not more than 0.75 dB.
3. Type SFF connectors may be used in termination racks, panels, and equipment packages.

2.7 CONSOLIDATION POINTS

A. Manufacturers: Subject to compliance with requirements, **provide products by one of the following**,

1. Hubbell Premise Wiring.
2. Panduit Corp.

B. Description: Consolidation points shall comply with requirements for cable connecting hardware.

1. Number of Terminals per Field: **One** for each conductor in assigned cables.
2. Number of Connectors per Field:

    a. **One**for each four-pair UTP cable indicated.
    One for each four-pair conductor group of indicated cables, plus **25** percent spare positions.

3. Mounting: **Wall** .
4. NRTL listed as complying with UL 50 and UL 1863.
5. When installed in plenums used for environmental air, NRTL listed as complying with UL 2043.

2.8 MULTIUSER TELECOMMUNICATIONS OUTLET ASSEMBLY (MUTOA)

A. Manufacturers: Subject to compliance with requirements, **provide products by one of the following**,

1. Hubbell Premise Wiring.
2. Panduit Corp.

B. Description: MUTOAs shall meet the requirements for cable connecting hardware.

1. Number of Terminals per Field: **One** for each conductor in assigned cables.
2. Number of Connectors per Field:

    a. **One** for each four-pair UTP cable indicated.
    b. **One** for each four-pair conductor group of indicated cables, plus 25 percent spare positions.

3. Mounting: **Wall**.
4. NRTL listed as complying with UL 50 and UL 1863.
5. Label shall include maximum length of work area cords, based on TIA/EIA-568-B.1.
6. When installed in plenums used for environmental air, NRTL listed as complying with UL 2043.

2.9 TELECOMMUNICATIONS OUTLET/CONNECTORS

A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA/EIA-568-B.1.

B. Workstation Outlets: **Two** port-connector assemblies mounted in **multigang** faceplate.

1. Plastic Faceplate: High-impact plastic. Coordinate color with Division 26 Section "Wiring Devices."
2. For use with snap-in jacks accommodating any combination of UTP, and optical fiber.

    a. Flush mounting jacks, positioning the cord at a 45-degree angle.
3. Legend: Snap-in, clear-label covers and machine-printed paper inserts.

2.10 GROUNDING

A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.

B. Comply with ANSI-J-STD-607-A.

2.11 IDENTIFICATION PRODUCTS

A. Comply with TIA/EIA-606-A and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

B. Comply with requirements in Division 26 Section "Identification for Electrical Systems."

2.12 SOURCE QUALITY CONTROL

A. Factory test UTP and optical fiber cables on reels according to TIA/EIA-568-B.1.

B. Factory test UTP cables according to TIA/EIA-568-B.2.

C. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.

D. Factory-sweep test coaxial cables at frequencies from 5 MHz to 1 GHz. Sweep test shall test the frequency response, or attenuation over frequency, of a cable by generating a voltage whose frequency is varied through the specified frequency range and graphing the results.

E. Cable will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES

A. Coordinate backbone cabling with the protectors and demarcation point provided by communications service provider.

3.2 WIRING METHODS

A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters **and except in accessible ceiling spaces, in attics, and in gypsum board partitions where unenclosed wiring method may be used**. Conceal raceway and cables except in unfinished spaces.

1. Install plenum cable in environmental air spaces, including plenum ceilings.
2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.3 INSTALLATION OF PATHWAYS

A. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A-7.

B. Comply with requirements for demarcation point, pathways, cabinets, and racks specified in Division 27 Section "Communications Equipment Room Fittings." Drawings indicate general arrangement of pathways and fittings.

C. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.

D. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.

E. Install manufactured conduit sweeps and long-radius elbows whenever possible.

F. Pathway Installation in Communications Equipment Rooms:

1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
2. Install cable trays to route cables if conduits cannot be located in these positions.
3. Secure conduits to backboard when entering room from overhead.
4. Extend conduits **3 inches (76 mm)** above finished floor.

5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

G. Backboards: Install backboards with 96-inch (2440-mm) dimension vertical. Butt adjacent sheets tightly, and form smooth gap-free corners and joints.

3.4 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Comply with TIA/EIA-568-B.1.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. MUTOA shall not be used as a cross-connect point.
5. Consolidation points may be used only for making a direct connection to telecommunications outlet/connectors:

    a. Do not use consolidation point as a cross-connect point, as a patch connection, or for direct connection to workstation equipment.
    b. Locate consolidation points for UTP at least 49 feet (15 m) from communications equipment room.

6. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
7. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
8. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
9. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
10. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
11. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
12. In the communications equipment room, install a 10-foot- (3-m-) long service loop on each end of cable.
13. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

1. Comply with TIA/EIA-568-B.2.
2. Do not untwist UTP cables more than 1/2 inch (12 mm) from the point of termination to maintain cable geometry.

D. Optical Fiber Cable Installation:

1. Comply with TIA/EIA-568-B.3.
2. Cable may be terminated on connecting hardware that is rack or cabinet mounted.

E. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend UTP cable not in a wireway or pathway a minimum of 8 inches (200 mm) above ceilings by cable supports not more than [**60 inches (1524 mm)**] <**Insert dimension**> apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

F. Group connecting hardware for cables into separate logical fields.

G. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA/EIA-569-A for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:

    a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches (127 mm).
    b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches (300 mm).
    c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches (610 mm).

3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:

    a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches (64 mm).
    b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches (150 mm).
    c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches (300 mm).

4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:

    a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
    b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches (76 mm).
    c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches (150 mm).

5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches (1200 mm).
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches (127 mm).

3.5 FIRESTOPPING

A. Comply with requirements in Division 07 Section "Penetration Firestopping."

B. Comply with TIA/EIA-569-A, Annex A, "Firestopping."

C. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.6 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.7 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

1. Administration Class: **1**.
2. Color-code cross-connect fields. Apply colors to voice and data service backboards, connections, covers, and labels.

B. Using cable management system software specified in Part 2, develop Cabling Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable and label cable, jacks, connectors, and terminals to which it connects with same designation. At completion, cable and asset management software shall reflect as-built conditions.

C. Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

D. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for **Class 2** level of administration**, including optional identification requirements of this standard**.

E. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.

F. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, [**backbone pathways and cables,**] [**entrance pathways and cables,**] terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of TIA/EIA-606-A. Furnish electronic record of all drawings, in software and format selected by Owner.

G. Cable and Wire Identification:

1. Label each cable within 4 inches (100 mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet (4.5 m).
4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

    a. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
    b. Label each unit and field within distribution racks and frames.

5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.
6. Uniquely identify and label work area cables extending from the MUTOA to the work area. These cables may not exceed the length stated on the MUTOA label.

H. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-A.

1. Cables use flexible vinyl or polyester that flex as cables are bent.

3.8 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Visually inspect UTP and optical fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-B.1.
2. Visually confirm **Category 6,** marking of outlets, cover plates, outlet/connectors, and patch panels.
3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
4. Test UTP backbone copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.

    a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

5. Optical Fiber Cable Tests:

    a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
    b. Link End-to-End Attenuation Tests:

        1) Horizontal and multimode backbone link measurements: Test at 850 or 1300 nm in 1 direction according to TIA/EIA-526-14-A, Method B, One Reference Jumper.
        2) Attenuation test results for backbone links shall be less than 2.0 dB. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-B.1.

6. UTP Performance Tests:

    a. Test for each outlet and MUTOA. Perform the following tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.2:

        1) Wire map.
        2) Length (physical vs. electrical, and length requirements).
        3) Insertion loss.
        4) Near-end crosstalk (NEXT) loss.
        5) Power sum near-end crosstalk (PSNEXT) loss.
        6) Equal-level far-end crosstalk (ELFEXT).
        7) Power sum equal-level far-end crosstalk (PSELFEXT).
        8) Return loss.
        9) Propagation delay.
        10) Delay skew.

7. Optical Fiber Cable Performance Tests: Perform optical fiber end-to-end link tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.3.

8. Final Verification Tests: Perform verification tests for UTP **and optical fiber** systems after the complete communications cabling and workstation outlet/connectors are installed.

    a. Voice Tests: These tests assume that dial tone service has been installed. Connect to the network interface device at the demarcation point. Go off-hook and listen and receive a dial tone. If a test number is available, make and receive a local, long distance, and digital subscription line telephone call.
    b. Data Tests: These tests assume the Information Technology Staff has a network installed and is available to assist with testing. Connect to the network interface device at the demarcation point. Log onto the network to ensure proper connection to the network.

C. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

D. End-to-end cabling will be considered defective if it does not pass tests and inspections.

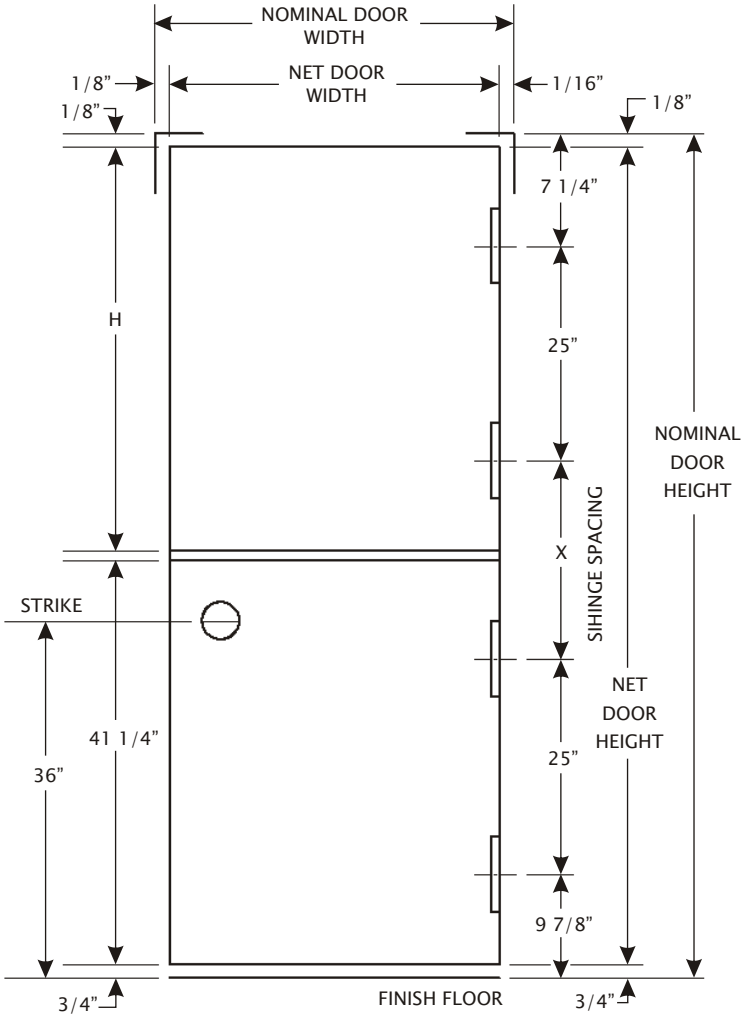
E. Prepare test and inspection reports.

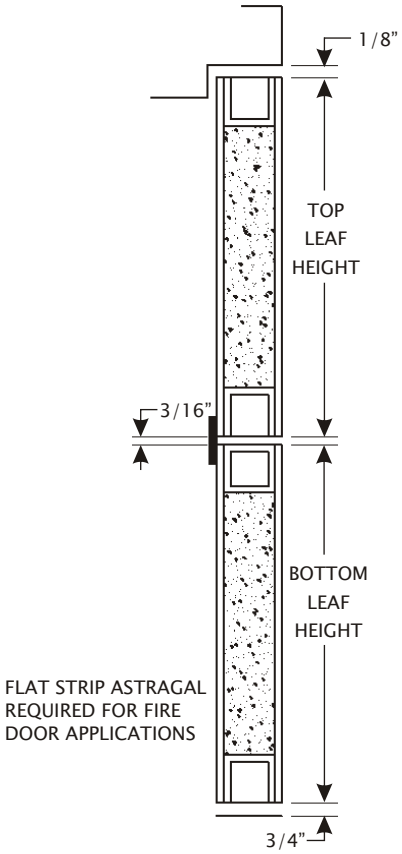
END OF SECTION 271500

TECHNICAL DATA SHEET

DS-106

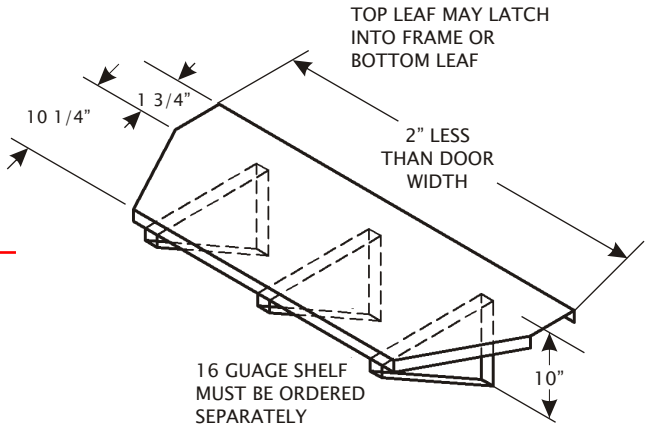
DUTCH DOORS





"X" AND "H" VARY WITH DOOR HEIGHT		
DOOR HEIGHT	H	X
6'-8"	3'-1 11/16"	12 7/8"
7'-0"	3'-5 11/16"	16 7/8"
7'-2"	3'-7 11/16"	18 7/8"

Flat strip astragal A2 latching for top leaf.



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FIRE INSULATED VAULT DOORS

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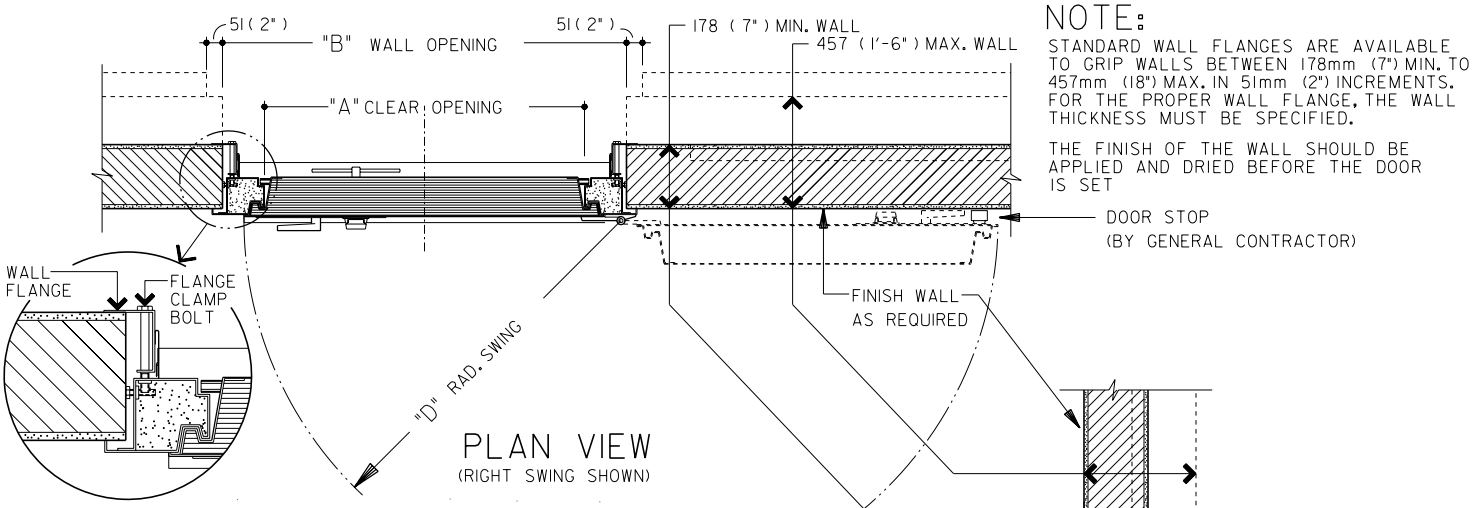
A228820

DIMENSIONS IN MILLIMETRES
(DIMENSIONS IN FEET-INCHES)

	MODEL	RATING	"A" CLEAR DOOR OPENING	"B" WALL OPENING	"C" FRONT FRAME	"D" RAD. SWING	SHIPPING WEIGHT	SPECIFY WALL THICKNESS
	1813	1 HR.	32" X 78"	42 1/2" X 83 1/2"	45 1/8" X 84 13/16"	39"	795	
	1814	1 HR.	40" X 78"	50 1/2" X 83 1/2"	53 1/8" X 84 13/16"	47"	995	
	1823	2 HR.	32" X 78"	42 1/2" X 83 1/2"	45 1/8" X 84 13/16"	39"	825	
X	1824	2 HR.	40" X 78"	50 1/2" X 83 1/2"	53 1/8" X 84 13/16"	47"	1,025	8" CMU
	1843	4 HR.	32" X 78"	42 1/2" X 83 1/2"	45 1/8" X 84 13/16"	39"	845	
	1844	4 HR.	40" X 78"	50 1/2" X 83 1/2"	53 1/8" X 84 13/16"	47"	1,040	
	1863	6 HR.	32" X 78"	42 1/2" X 83 1/2"	45 1/8" X 84 13/16"	39"	875	
	1864	6 HR.	40" X 78"	50 1/2" X 83 1/2"	53 1/8" X 84 13/16"	47"	1,070	

THIRD ANGLE PROJECTION

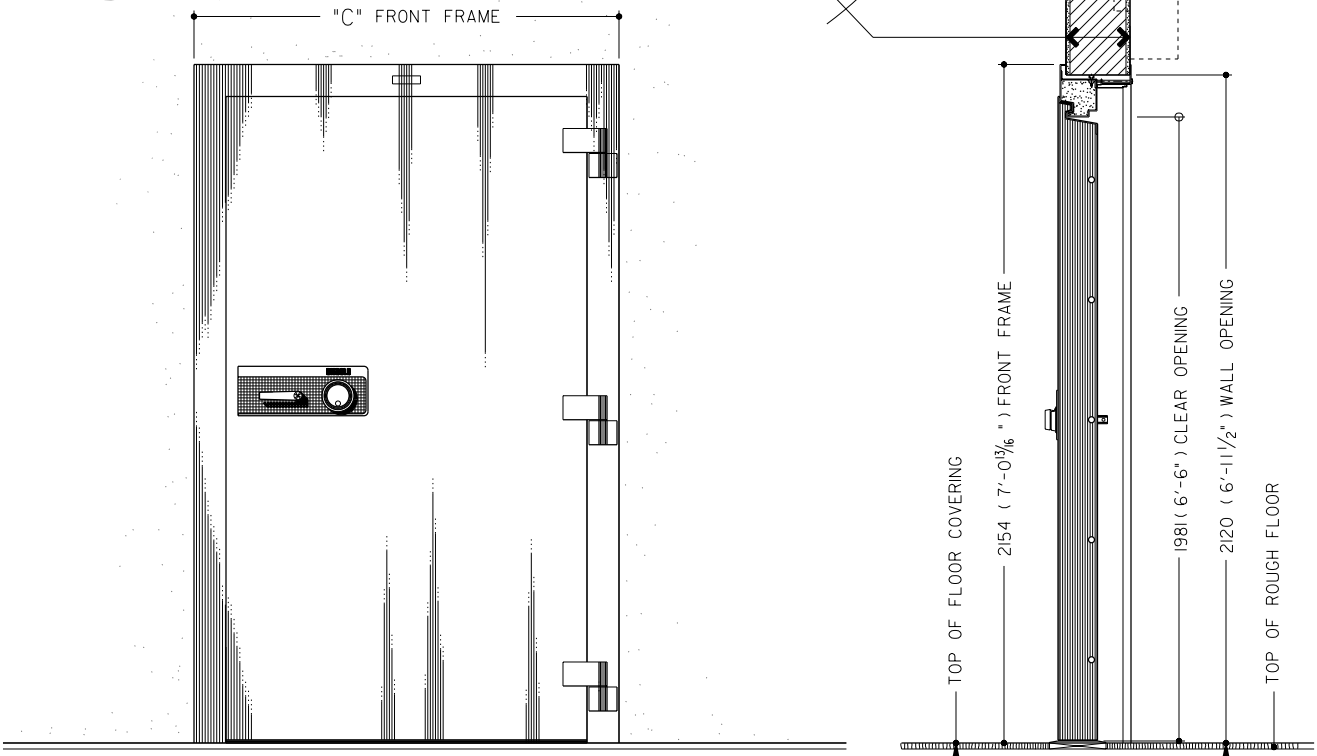


NOTE:

STANDARD WALL FLANGES ARE AVAILABLE TO GRIP WALLS BETWEEN 178mm (7") MIN. TO 457mm (18") MAX. IN 51mm (2") INCREMENTS. FOR THE PROPER WALL FLANGE, THE WALL THICKNESS MUST BE SPECIFIED.

THE FINISH OF THE WALL SHOULD BE APPLIED AND DRIED BEFORE THE DOOR IS SET

PLAN VIEW
(RIGHT SWING SHOWN)



ELEVATION

SECTION

DIMENSION SHOWN ARE TO TOP OF FLOOR COVERING (TOP OF CARPET, TILE, ETC.) ALLOW FOR THICKNESS OF FLOOR COVERING IN PREPARING THE OPENING. USE FILL UNDER SILL (BY OTHERS AT INSTALLATION) TO MAINTAIN CLEARANCE OF 10mm (3/8") FROM DOOR TO TOP OF FLOOR COVERING.

STANDARD ITEMS:

1. U.L. FIRE ENDURANCE, U.L. RELOCK, U.L. GROUP II COMBINATION LOCK.
2. PANIC ESCAPE MECHANISM: ALLOWS A PERSON LOCKED IN VAULT TO OPEN THE DOOR FROM THE INSIDE.
3. COLORS

- ☐ PLANTINUM
- ☐ DAWN
- ☐ GRAY I
- ☐ PLAZZA GRAY
- ☐ BLACK
- ☐ TOPAZ
- ☐ LIGHT CHARCOAL

OPTIONAL ITEMS:

1. KEYLOCKING BOLT THROW HANDLE.
2. KEYLOCKING DIAL.
3. DUAL CONTROL; SECOND COMBINATION LOCK.
4. DAYGATE (SEE BACK PAGE)
5. COLORS

- ☐ SILVER GRAY
- ☐ SEA GRAY
- ☐ AQUA
- ☐ WILLIAMSBURG GREEN
- ☐ BRITTANY BLUE
- ☐ TAN I
- ☐ NUTMEG
- ☐ ROSEWOOD
- ☐ WINEBERRY

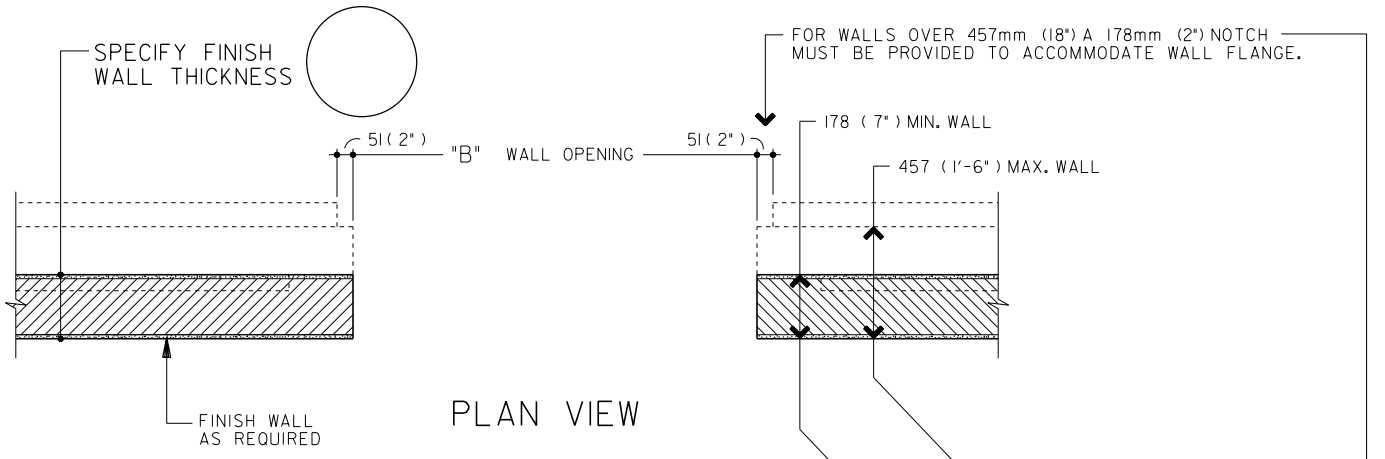
NOTE:

STANDARD WALL FLANGES ARE AVAILABLE TO GRIP WALLS BETWEEN 178mm (7") MIN. TO 457mm (18") MAX. IN 51mm (2") INCREMENTS. FOR THE PROPER WALL FLANGE, THE WALL THICKNESS MUST BE SPECIFIED.

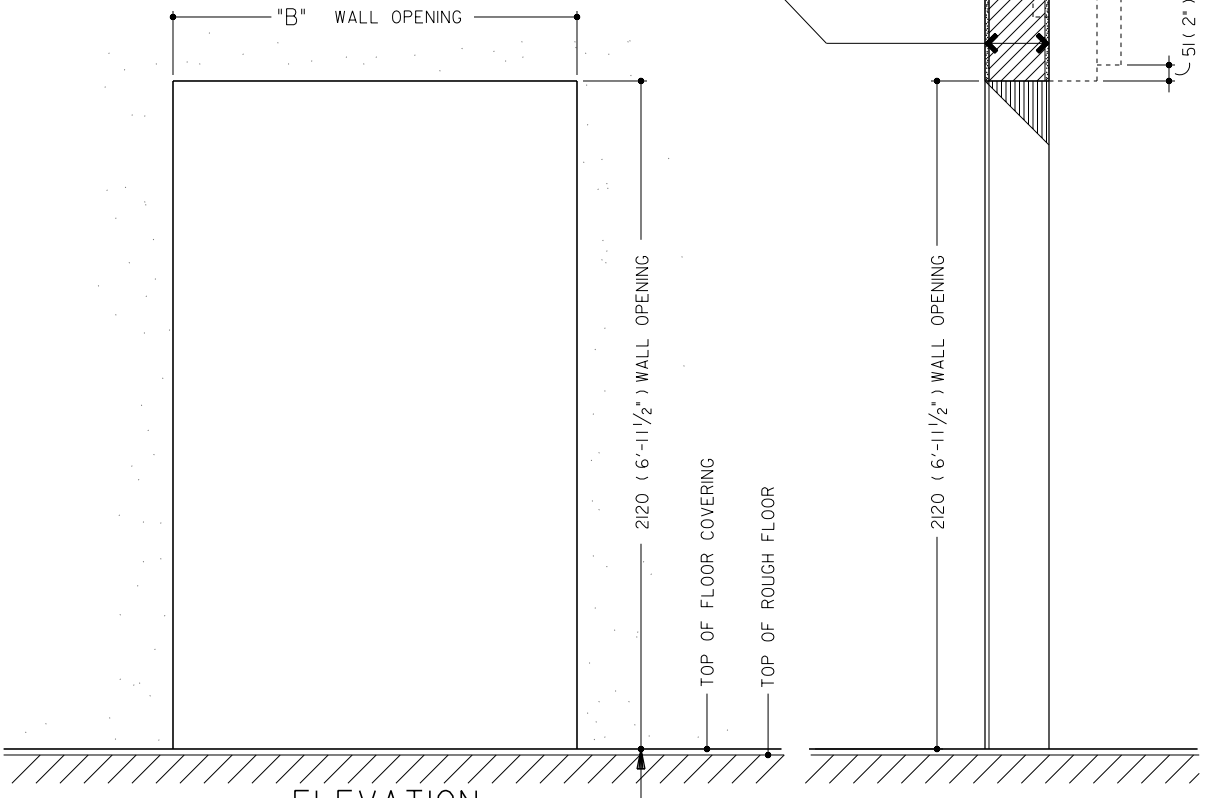
THE FINISH OF THE WALL SHOULD BE APPLIED AND DRIED BEFORE THE DOOR IS SET

DIMENSIONS IN MILLIMETRES (DIMENSIONS IN FEET-INCHES)

THIRD ANGLE PROJECTION



PLAN VIEW



ELEVATION

DIMENSION SHOWN ARE TO TOP OF FLOOR COVERING (TOP OF CARPET, TILE, ETC.) ALLOW FOR THICKNESS OF FLOOR COVERING IN PREPARING THE OPENING. USE FILL UNDER SILL (BY OTHERS AT INSTALLATION) TO MAINTAIN CLEARANCE OF 10mm (3/8") FROM DOOR TO TOP OF FLOOR COVERING.

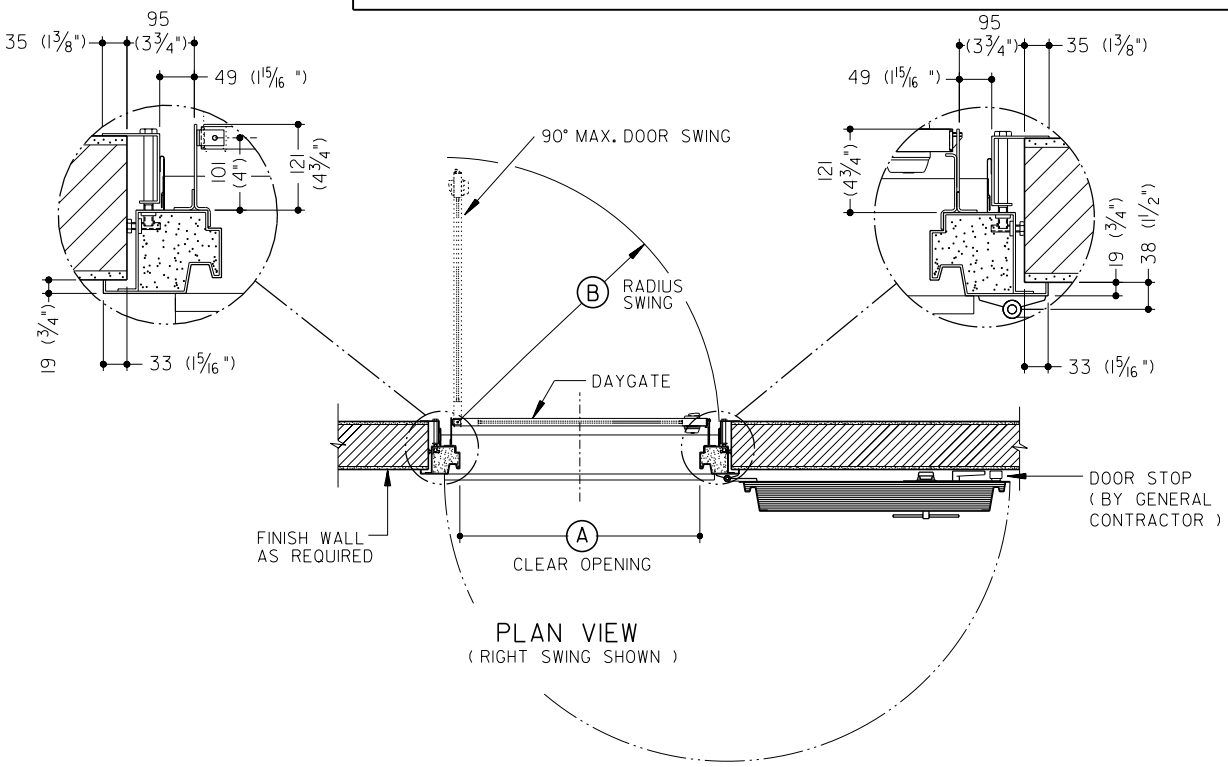
SECTION

DAYGATES
(FOR DIEBOLD INSULATED VAULT DOORS)

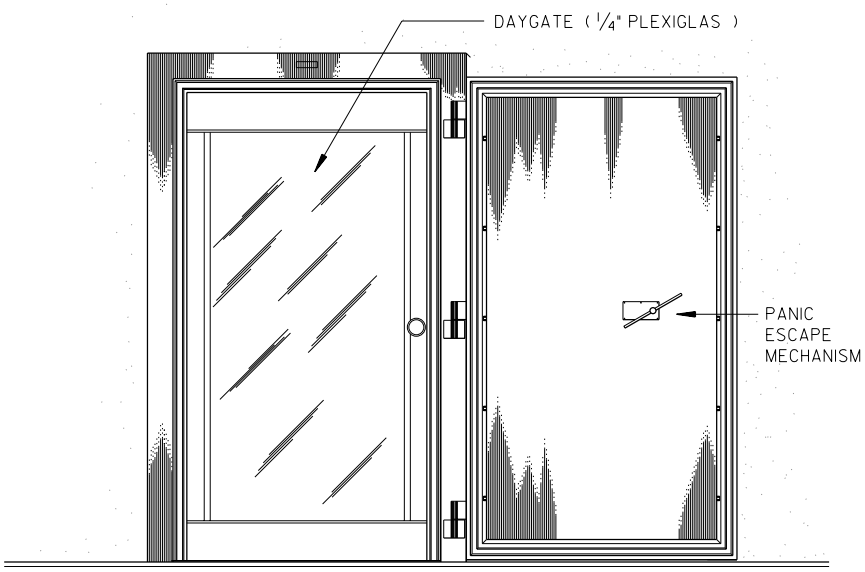
CALL 1-800-999-3600

DIMENSIONS IN MILLIMETRES
(DIMENSIONS IN FEET-INCHES)

THIRD ANGLE PROJECTION



PLAN VIEW
(RIGHT SWING SHOWN)



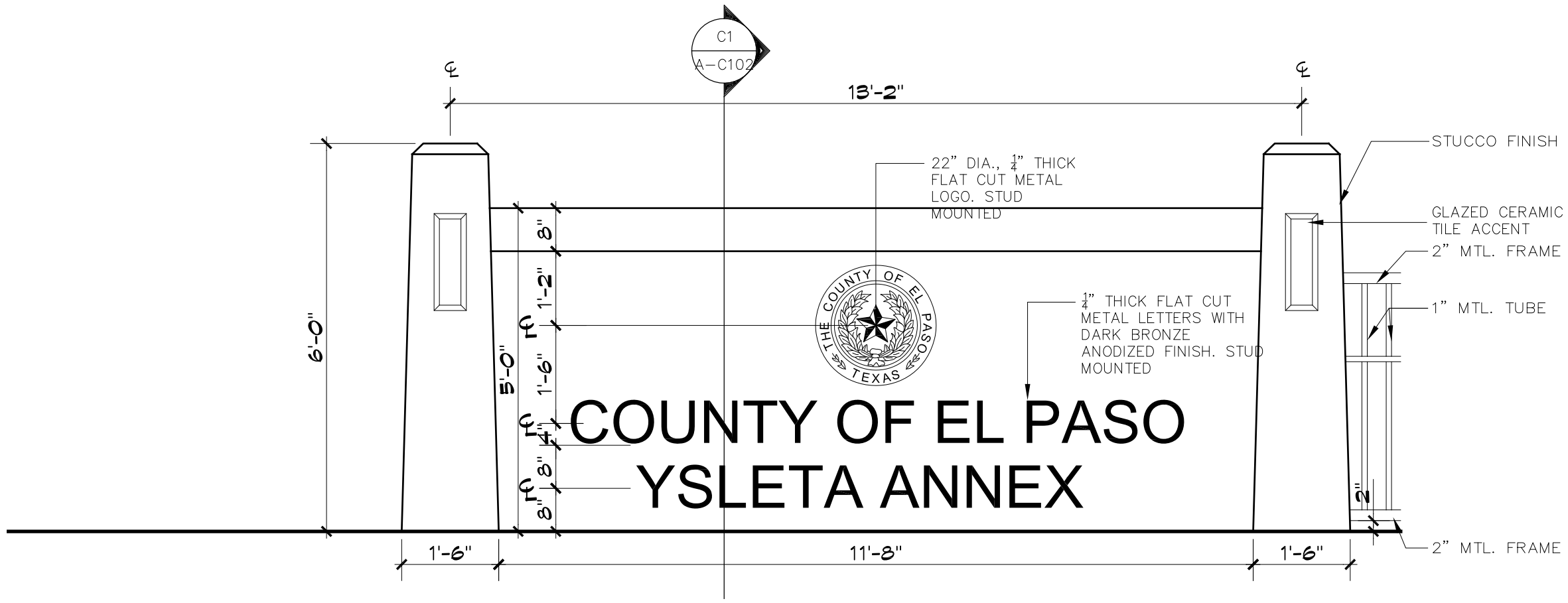
ELEVATION
(PLEXIGLAS DAYGATE)

OPTIONAL DAYGATE (SELECT APPROPRIATE MODEL)

	DAYGATE MODEL NUMBER	"A" DIMENSION	"B" DIMENSION	USED WITH VAULT DOOR MODEL NO.
	154-75 PLEXIGLAS	813 (2'-8")	854 (2'-9 5/8")	1813, 1823, 1843, 1863
	154-76 PLEXIGLAS	1016 (3'-4")	1057 (3'-5 5/8")	1814, 1824, 1844, 1864

ALL DIMENSIONS AND DESIGN CRITERIA SUBJECT TO CHANGE WITHOUT NOTICE.

FILE NO. 30-820 REV. 5



1 MONUMENTAL SIGN DETAIL TYP 1 OF 2

SCALE: 1/2" - 1'-0"

☑ Supplementary Drawing No. _____			Project: NEW YSLETA ANNEX BUILDING
☐ Change Order No. _____ Item. _____			Drawing Title: MONUMENTAL SIGN DETAIL TYP
☐ Addendum No. _____ Page. _____ Par. _____			
☐ _____			
Scale: 1/2" = 1' - 0"	Date: 02/27/2008	Drawn By: JR2	Checked By: JR

Wright & Dalbin Architects Inc.
2112 Murchison Dr., El Paso, Texas 79930 915/ 533-3777 Fax 915/ 532-7733

Sheet No. AD1.1

ROOM FINISH KEY

F1 FLOOR		B 2 BASE		W 1 WALLS		C 4 CEILING	
F1	CARPET TILE -- --	**B1**	RUBBER VINYL BASE -- --	**W1**	PAINT AND TEXTURE -- --	**C1**	2'x4' SUSPENDEN CEILING SYSTEM -- --
F2	LINOLIUM COMPOSITE TILE -- --	**B2**	CERAMIC BASE -- --	**W2**	CERAMIC WAINSCOAT -- --	**C2**	PAINTED GYPSUM BOARD -- --
F3	UNGLAZED CERAMIC TILE -- --	**B3**		**W3**		**C3**	
F4		**B4**		**W4**		**C4**	
F5		**B5**		**W5**		**C5**	

NOTES:

1. VERIFY COLORS WITH ARCHITECT. PAINT FIELD SAMPLES OF EACH COLOR FOR THE ARCHITECT'S APPROVAL. COLORS AND SAMPLES SHOWN ARE FOR BIDDING PROPOSES ONLY.

2. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

DOOR AND FRAME SCHEDULE

DOOR									FRAME						FIRE RATING LABEL	HARDWARE		NOTES	
MARK	SIZE			MATL	EL	GLZ	LOUVER		MATL	EL	GLZ	DETAIL				SET NO.	KEYSIDE RM NO		
	W	HT	THK				W	HT				HEAD	JAMB	SILL					
ALTERNATE OFFICE SPACE - 1																			
250A	6'	7'	1.75	ALUM	B	INS			ALUM	B	INS	C5	A4	A5		01		TINTED	BASE BID
250B	3'	7'	1.75	HM	D				HM	D		D1	C1	A5		02			BASE BID
250C	3'	7'	1.375	WOOD	D				HM	D		C4	B4			07			
250D	3'	7'	1.375	WOOD	D				HM	D		C4	B4			10			
250E	3'	7'	1.375	WOOD	D				HM	D		C4	B4			08			
250F	3'	7'	1.375	WOOD	D				HM	D		C4	B4			11			
250G	3'	7'	1.375	WOOD	D				HM	D		C4	B4			04			
250H	3'	7'	1.375	WOOD	D				HM	D		C4	B4			10			

DOOR SCHEDULE AND ROOM FINISH SCHEDULE

☑ Supplementary Drawing No. _____
☐ Change Order No. _____ Item. _____
☐ Addendum No. _____ Page. _____ Par. _____
☐ _____

Project: NEW YSLETA ANNEX BUILDING

Drawing Title: FLOOR PLAN - BUILDING "A"

Sheet No. AD1.2.1

Scale:	Date:	Drawn By:	Checked By:
1/8" = 1' - 0"	02/27/2008	JR2	JR

Wright & Dalbin Architects Inc.
2112 Murchison Dr., El Paso, Texas 79930 915/ 533-3777 Fax 915/ 532-7733

DOOR AND FRAME SCHEDULE

DOOR									FRAME						FIRE RATING LABEL	HARDWARE		NOTES	
MARK	SIZE			MATL	EL	GLZ	LOUVER		MATL	EL	GLZ	DETAIL				SET NO.	KEYSIDE RM NO		
	W	HT	THK				W	HT				HEAD	JAMB	SILL					
ALTERNATE OFFICE SPACE - 2																			
270A	6’	7’	1.75	ALUM	A	INS			ALUM	A	INS	C5	B5	A5		01		TINTED	BASE BID
270B	3’	7’	1.75	HM	D				HM	D		D1	C1	A5		02			BASE BID
270C	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270D	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270E	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270F	3’	7’	1.375	WOOD	D				HM	D		C4	B4			04			
270G	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270H	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270J	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270K	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270L	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270M	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270N	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270Q	3’	7’	1.375	WOOD	D				HM	D		C4	B4			11			
270P	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270Q	3’	7’	1.375	WOOD	D				HM	D		C4	B4			10			
270R	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
270S	3’	7’	1.375	WOOD	D	D			HM	D		A2	A3			11			
270T	3’	7’	1.375	WOOD	D	D			HM	D		A2	A3			11			
270V	3’	7’	1.375	WOOD	D				HM	D		C4	B4			10			
270W	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			

DOOR SCHEDULE

☑ Supplementary Drawing No. _____
☐ Change Order No. _____ Item. _____
☐ Addendum No. _____ Page. _____ Par. _____
☐ _____

Scale:	Date:	Drawn By:	Checked By:
1/8" = 1' - 0"	02/27/2008	JR2	JR

Project: NEW YSLETA ANNEX BUILDING

Drawing Title: FLOOR PLAN - BUILDING "A"

Wright & Dalbin Architects Inc.
2112 Murchison Dr., El Paso, Texas 79930 915/ 533-3777 Fax 915/ 532-7733

Sheet No. AD1.2.2

ALTERNATE OFFICE SPACE - 3																			
290A	6’	7’	1.75	ALUM	A	INS			ALUM	A	INS	C5	B5	A5		01		TINTED	BASE BID
290B	3’	7’	1.75	HM	D				HM	D		D1	C1	A5		02			BASE BID
290C	3’	7’	1.375	WOOD	D				HM	D		C4	B4			07			
290D	3’	7’	1.375	WOOD	D				HM	D		C4	B4			11			
290E	3’	7’	1.375	WOOD	D				HM	D		C4	B4			10			
290F	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
290G	3’	7’	1.375	WOOD	D				HM	D		C4	B4			08			
290H	3’	7’	1.375	WOOD	D				HM	D		C4	B4			04			
290J	3’	7’	1.375	WOOD	D				HM	D		C4	B4			10			

DOOR SCHEDULE

☑ Supplementary Drawing No. _____
☐ Change Order No. _____ Item. _____
☐ Addendum No. _____ Page. _____ Par. _____
☐ _____

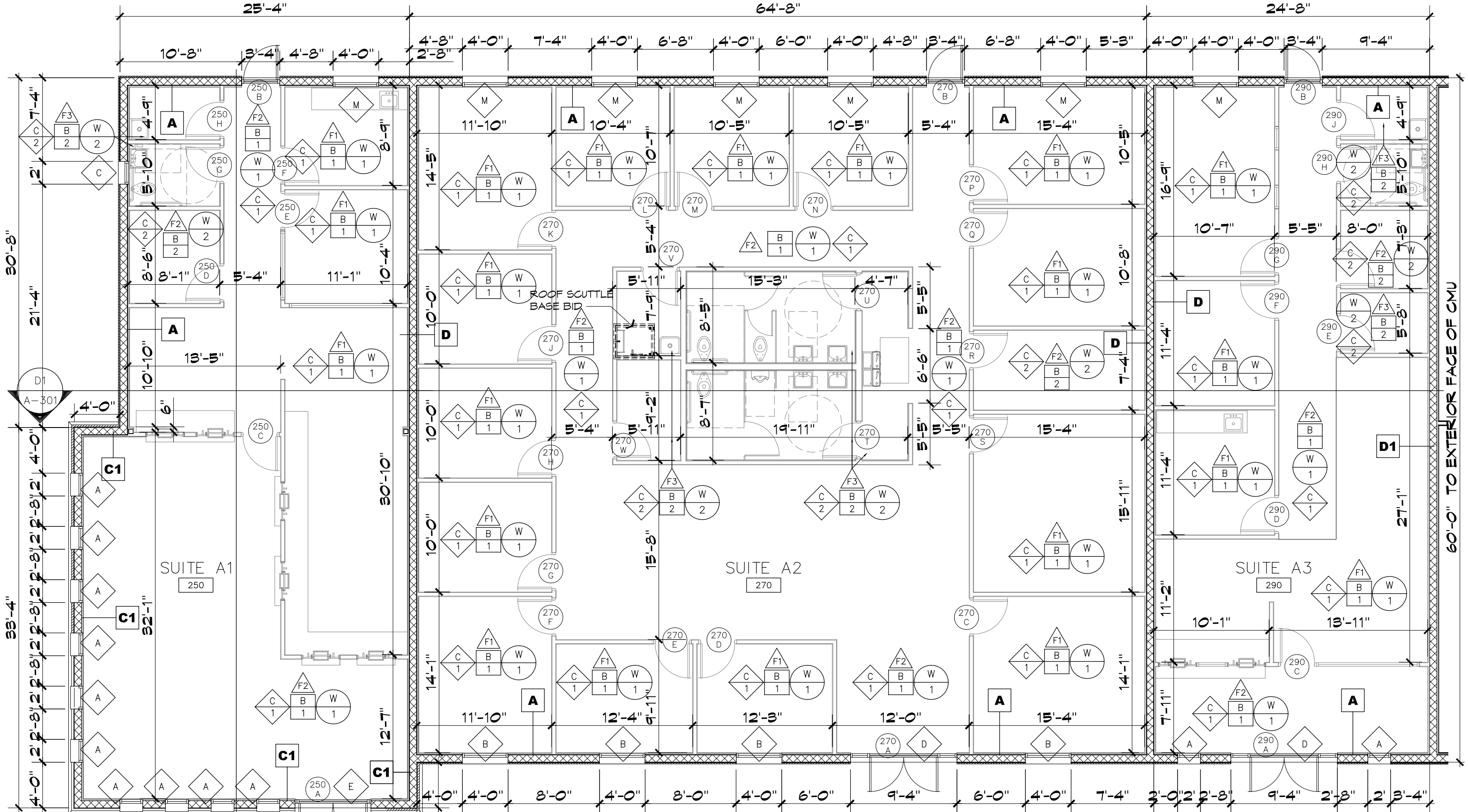
Scale:	Date:	Drawn By:	Checked By:
1/8" = 1' - 0"	02/27/2008	JR2	JR

Project:
NEW YSLETA ANNEX BUILDING

Drawing Title:
FLOOR PLAN - BUILDING "A"

Wright & Dalbin Architects Inc.
2112 Murchison Dr., El Paso, Texas 79930 915/ 533-3777 Fax 915/ 532-7733

Sheet No.
AD1.2.3

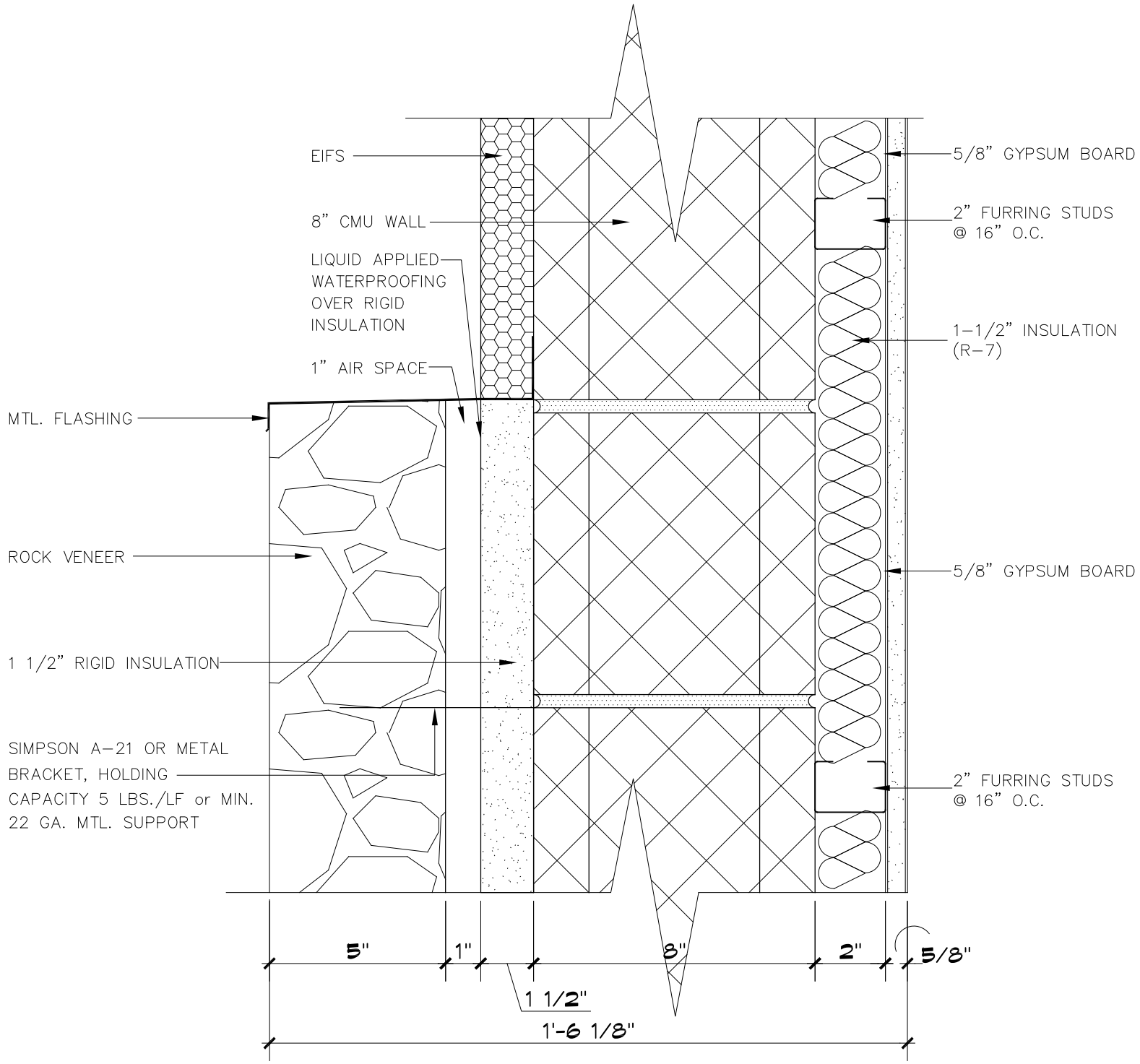


FLOOR PLAN - BUILDING "A" ALTERNATE No. 1a, 1b & 1c

SCALE: 1/8" = 1' - 0"

☑ Supplementary Drawing No.		Project: NEW YSLETA ANNEX BUILDING	Sheet No.
☐ Change Order No. ____ Item. ____		Drawing Title: FLOOR PLAN - BUILDING "A" ALTERNATE No. 1a, 1b & 1c	AD1.2
☐ Addendum No. ____ Page. ____ Par. ____			
☐ ____			
Scale: 1/8" = 1' - 0"	Date: 02/20/2008	Drawn By: JR2	Checked By: JR

Wright & Dalbin Architects Inc.
2112 Murchison Dr., El Paso, Texas 79930 915/ 533-3777 Fax 915/ 532-7733



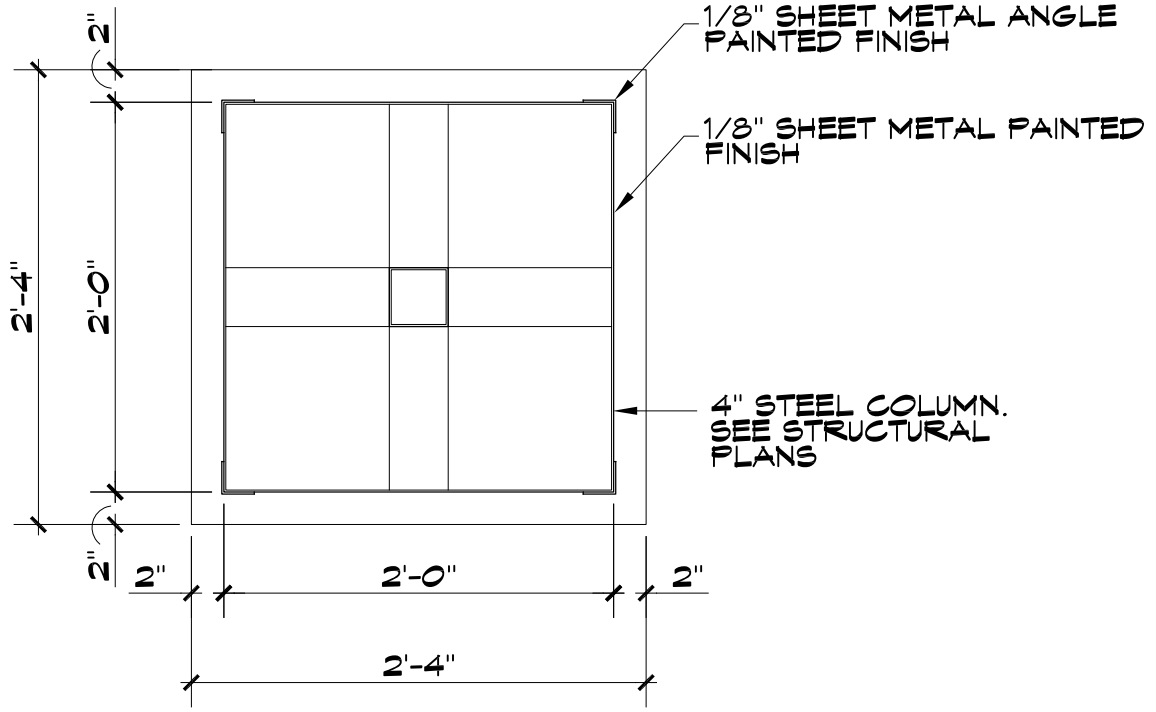
1 FLASHING DETAIL

SCALE: 3" = 1' - 0"

☑ Supplementary Drawing No. _____			Project: NEW YSLETA ANNEX BUILDING
☐ Change Order No. _____ Item. _____			Drawing Title: FLASHING DETAIL
☐ Addendum No. _____ Page. _____ Par. _____			
☐ _____			
Scale: 3" = 1' - 0"	Date: 02/27/2008	Drawn By: JR2	Checked By: JR

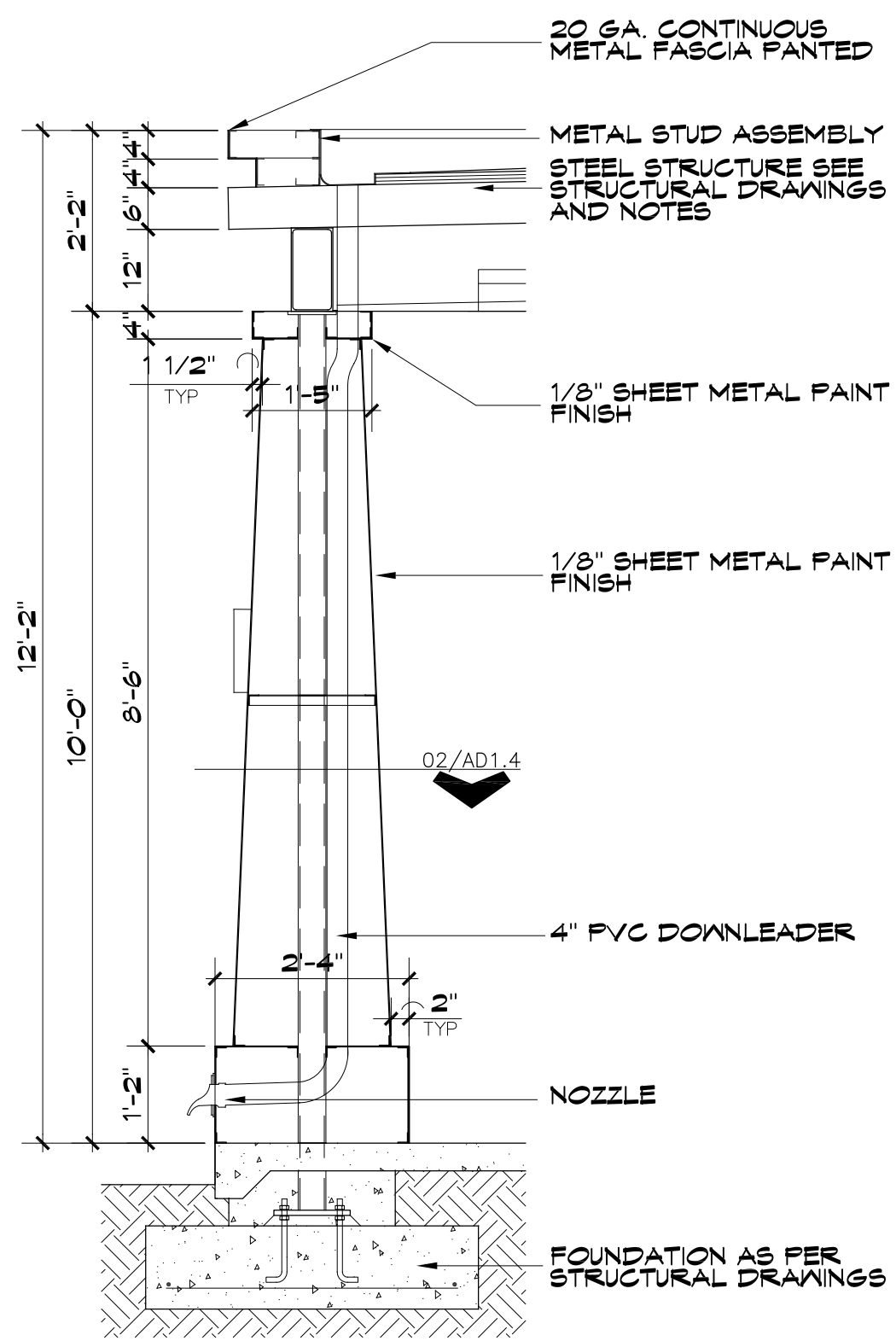
Wright & Dalbin Architects Inc.
2112 Murchison Dr., El Paso, Texas 79930 915/ 533-3777 Fax 915/ 532-7733

Sheet No. AD1.3



02 STEEL COLUMN SECTION

SCALE: 1" = 1' - 0"

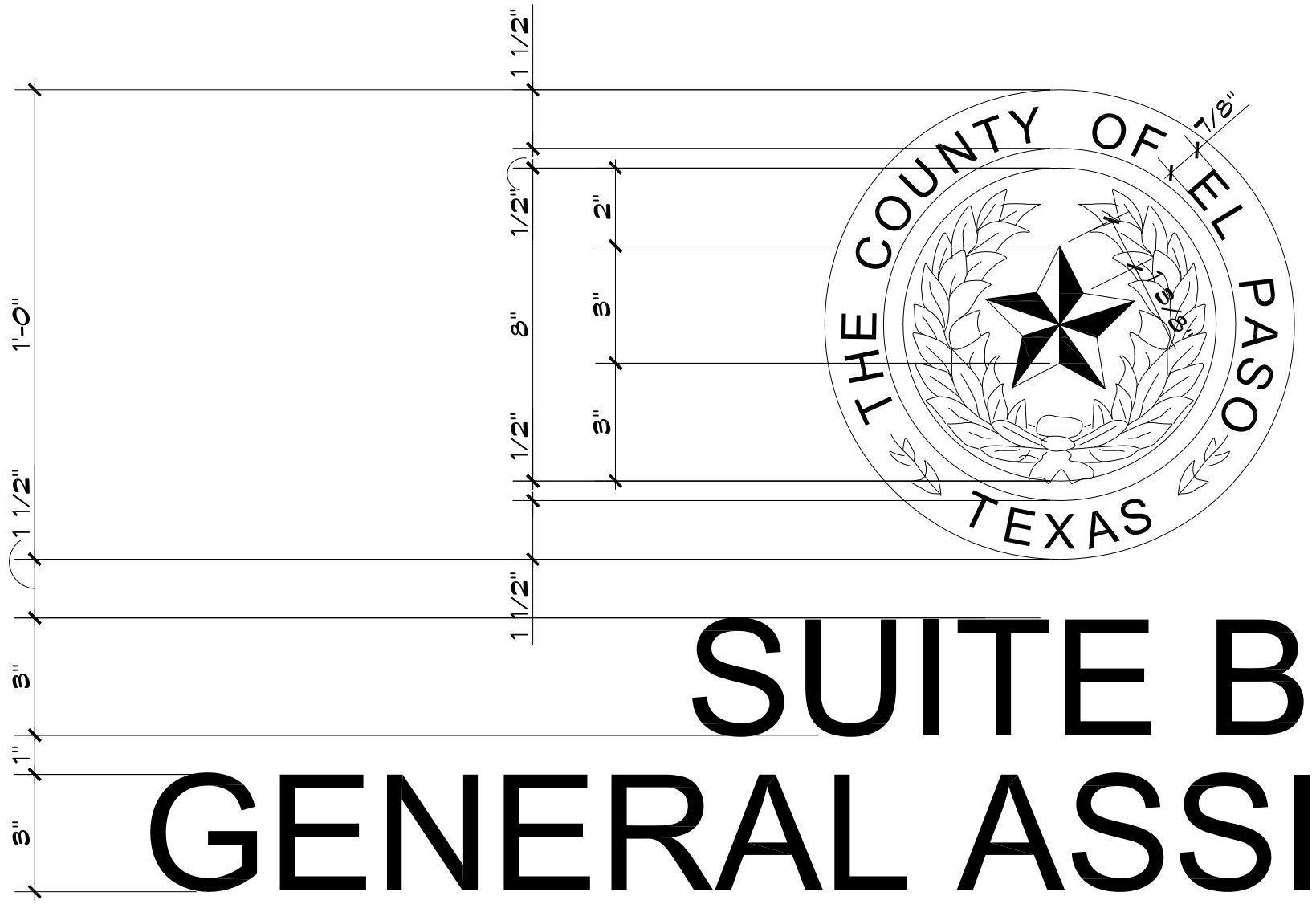


01 STEEL COLUMN DETAIL

SCALE: 1/2" = 1' - 0"

☑ Supplementary Drawing No. _____		Project: NEW YSLETA ANNEX BUILDING	Sheet No.
☐ Change Order No. _____ Item. _____			
☐ Addendum No. _____ Page. _____ Par. _____		Drawing Title: STEEL COLUMN DETAIL	AD1.4
☐ _____			
Scale: 1/2" = 1' - 0"	Date: 02/27/2008	Drawn By: JR2	Checked By: JR

Wright & Dalbin Architects Inc.
2112 Murchison Dr., El Paso, Texas 79930 915/ 533-3777 Fax 915/ 532-7733



SUITE B-1
GENERAL ASSISTANCE

1 DECAL SIGN AT FRONT ENTRANCE DOORS TYPICAL IN ALL DEPARTMENTS

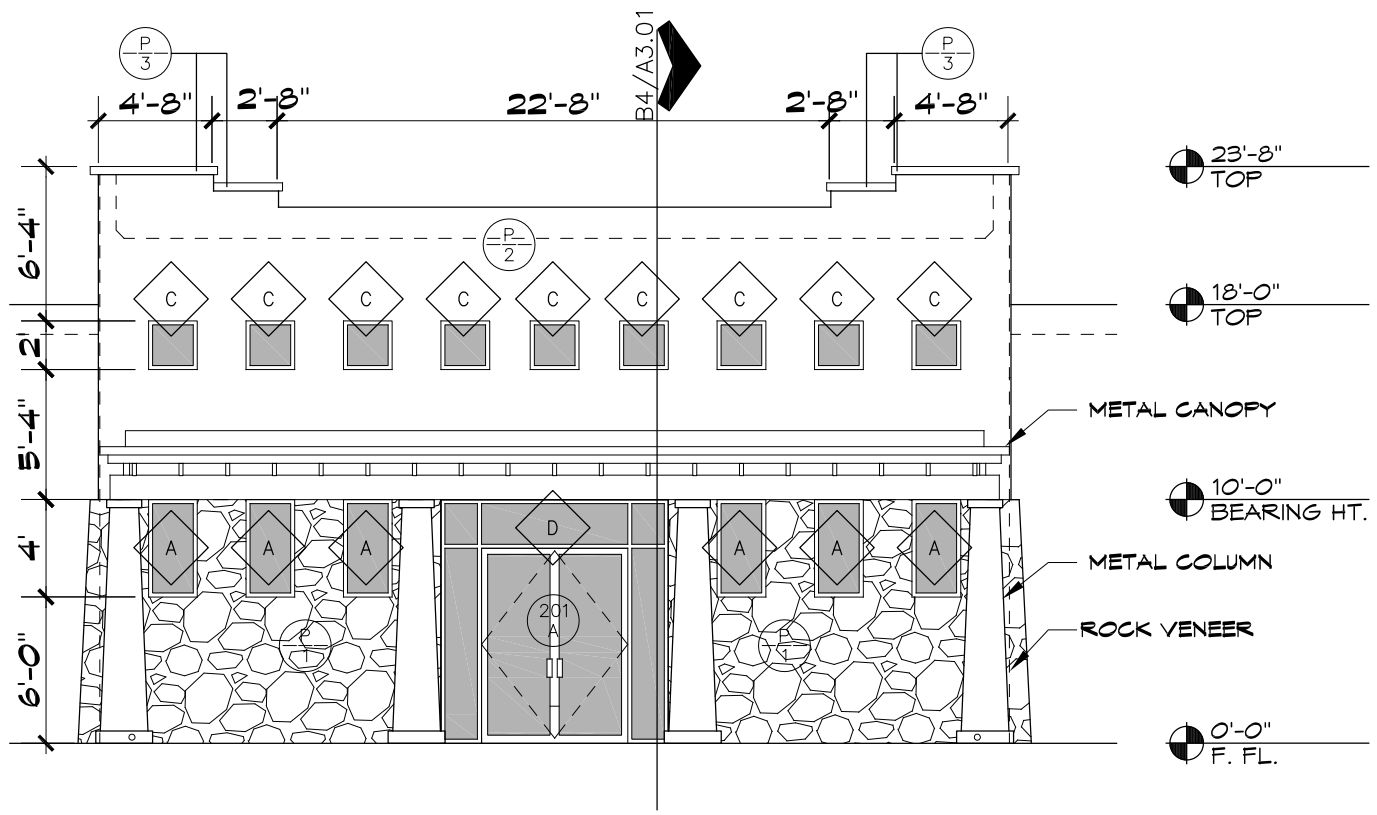
SCALE: 3" = 1' - 0"

NOTE:
SUITE NUMBER AND ROOM NAME VARIES ACCORDING TO SPACE, SEE SHEET A-114 FOR REFERENCE
COORDINATE WITH OWNER FOR FINAL APPROVAL

☑ Supplementary Drawing No. _____			Project: NEW YSLETA ANNEX BUILDING
☐ Change Order No. _____ Item. _____			Drawing Title: DECAL SIGN AT FRONT ENTRANCE DOORS
☐ Addendum No. _____ Page. _____ Par. _____			
☐ _____			
Scale: 3" = 1' - 0"	Date: 02/27/2008	Drawn By: JR2	Checked By: JR

Wright & Dalbin Architects Inc.
2112 Murchison Dr., El Paso, Texas 79930 915/ 533–3777 Fax 915/ 532–7733

Sheet No.
AD1.5



D1 EXTERIOR ELEVATION

SCALE: 1/8" = 1' - 0"

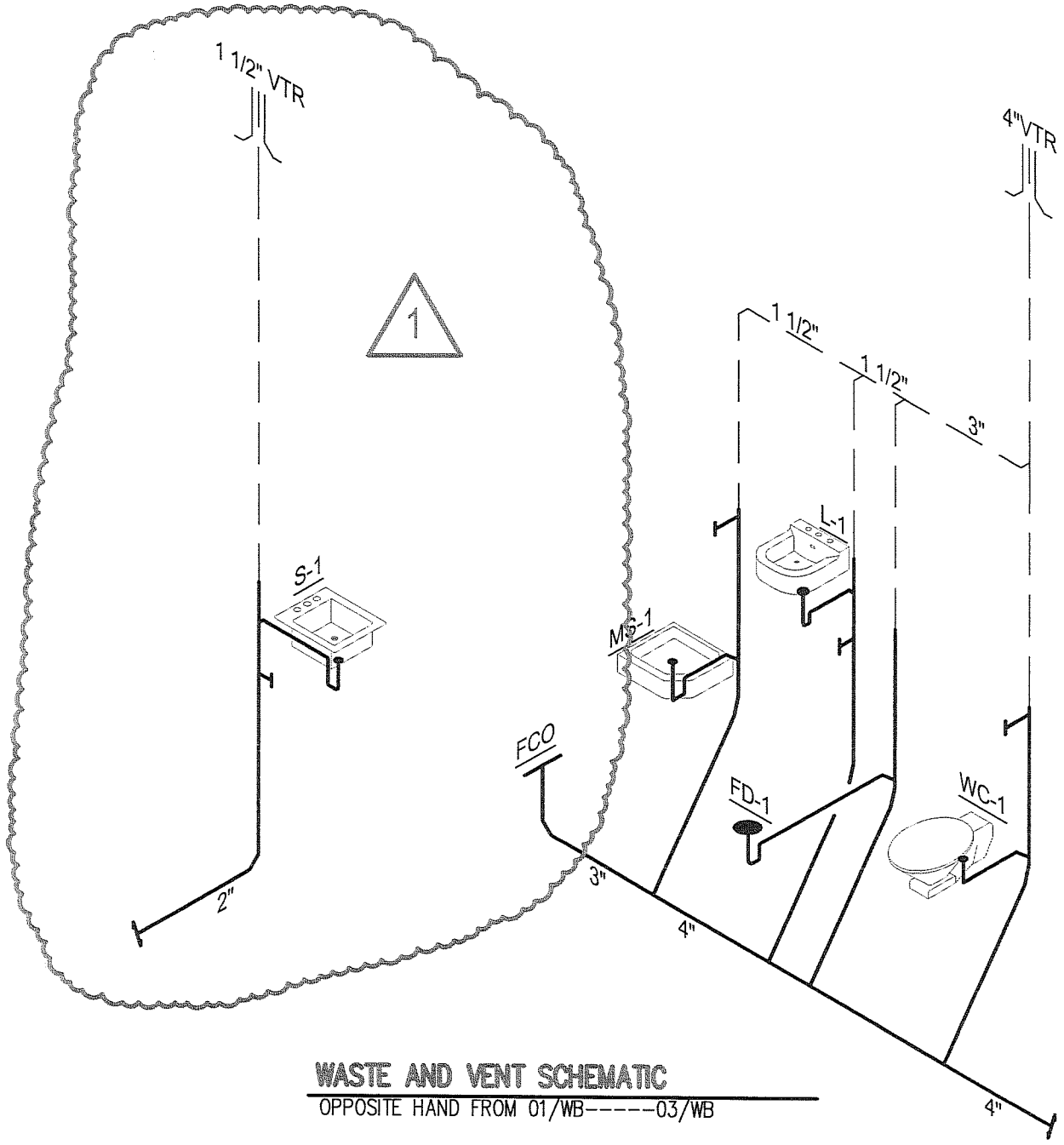
☑ Supplementary Drawing No. _____			
☐ Change Order No. _____ Item. _____			
☐ Addendum No. _____ Page. _____ Par. _____			
☐ _____			
Scale: 1/8" = 1' - 0"	Date: 02/27/2008	Drawn By: JR2	Checked By: JR

Project: NEW YSLETA ANNEX BUILDING

Drawing Title: EXTERIOR ELEVATION - BUILDING "A"

Wright & Dalbin Architects Inc.
2112 Murchison Dr., El Paso, Texas 79930 915/ 533-3777 Fax 915/ 532-7733

Sheet No. AD1.6



WASTE AND VENT SCHEMATIC

OPPOSITE HAND FROM 01/WB-----03/WB

1 02-26-08
ATTACH TO SHEET
P3.00

07.02.10 YSLETA ANNEX

Consultant

Trinity consulting

DRAWING COORDINATION

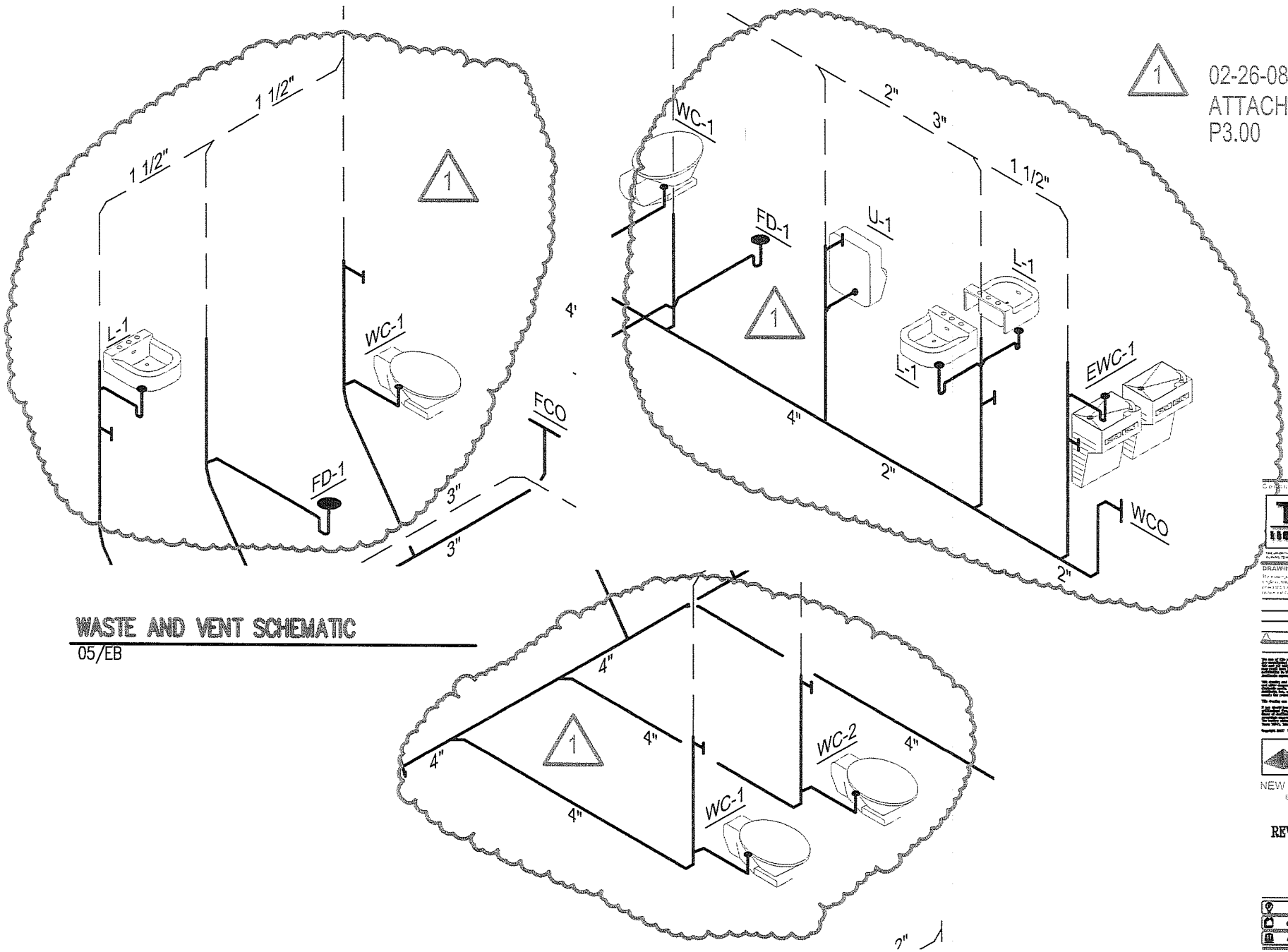
WRIGHT & DARBIN

NEW YSLETA ANNEX BUILDING

EL PASO, TEXAS - SOCORRO ROAD

REVISED PLUMBING SCHEMATIC

R1



1 02-26-08
ATTACH TO SHEET
P3.00

07.02.19 YSLETA ANNEX

WASTE AND VENT SCHEMATIC
05/EB

Trinity mep consulting

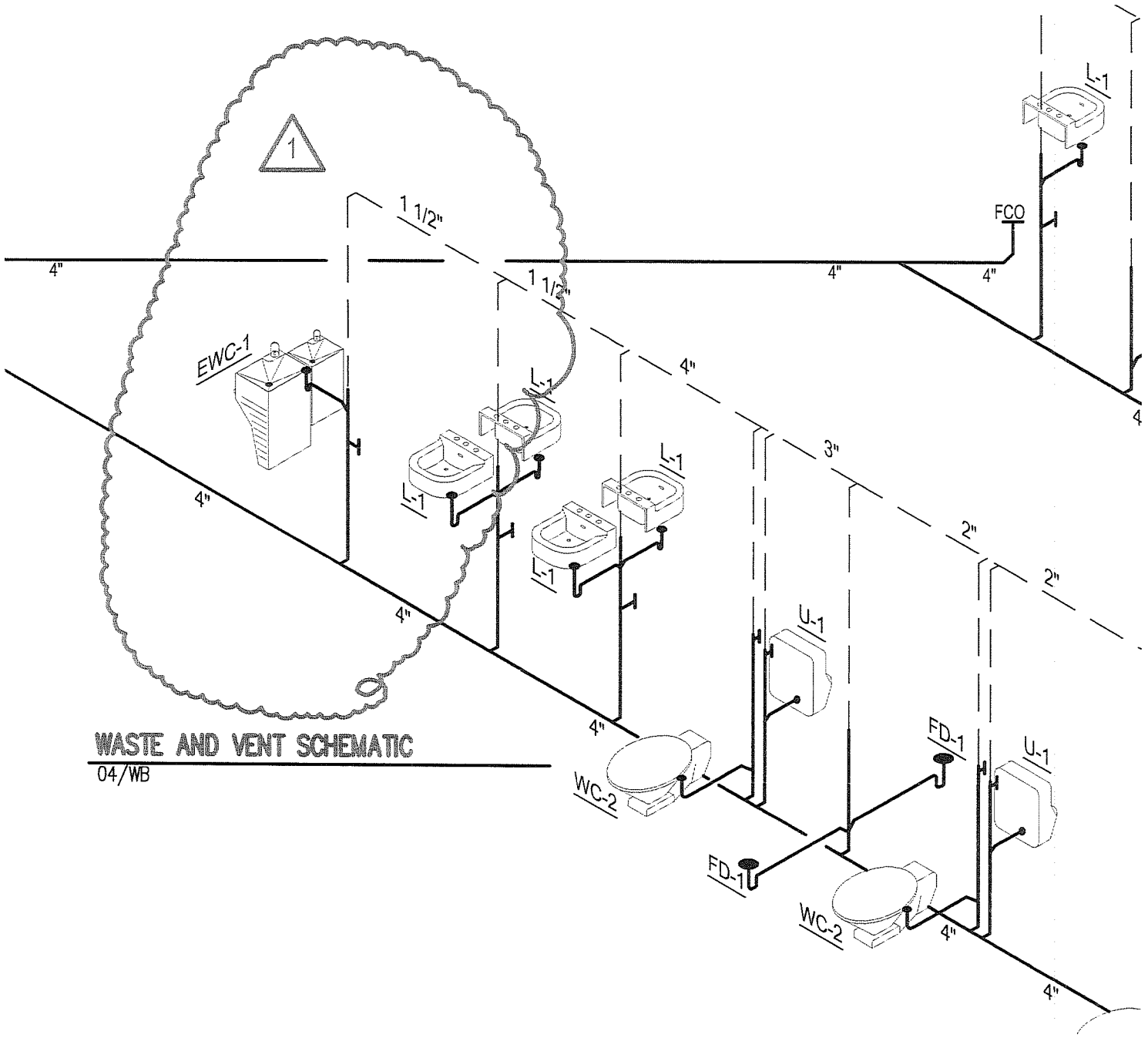
DRAWING COORDINATION

WRIGHT & TABBIN W&D

NEW YSLETA ANNEX BUILDING
EL PASO, TEXAS - SOCORRO ROAD

REVISED PLUMBING SCHEMATIC

R2



WASTE AND VENT SCHEMATIC

04/WB

1 02-26-08
ATTACH TO SHEET P3.00

07.02.19 YSLETA ANNEX

Consultant

Trinity mconsulting

DRAWING COORDINATION

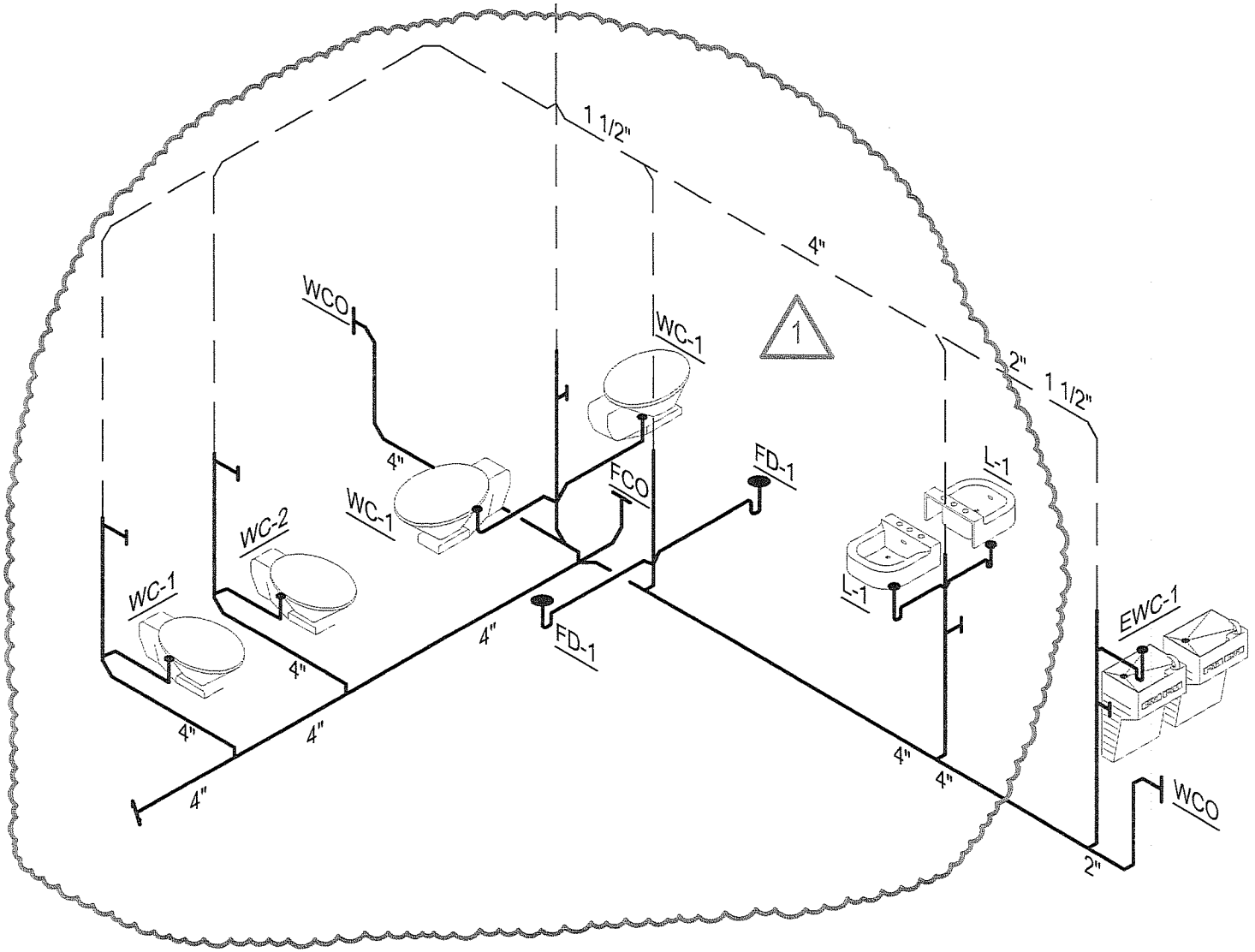
WRIGHT & DARBIN W&D

NEW YSLETA ANNEX BUILDING

EL PASO, TEXAS - GOODRICH ROAD

REVISED PLUMBING SCHEMATIC

R3



WASTE AND VENT SCHEMATIC

06/EB

1 02-26-08
ATTACH TO SHEET P3.00

07.02.19 YSLETA ANNEX

Consultant

Trinity mconsulting

DRAWING COORDINATION

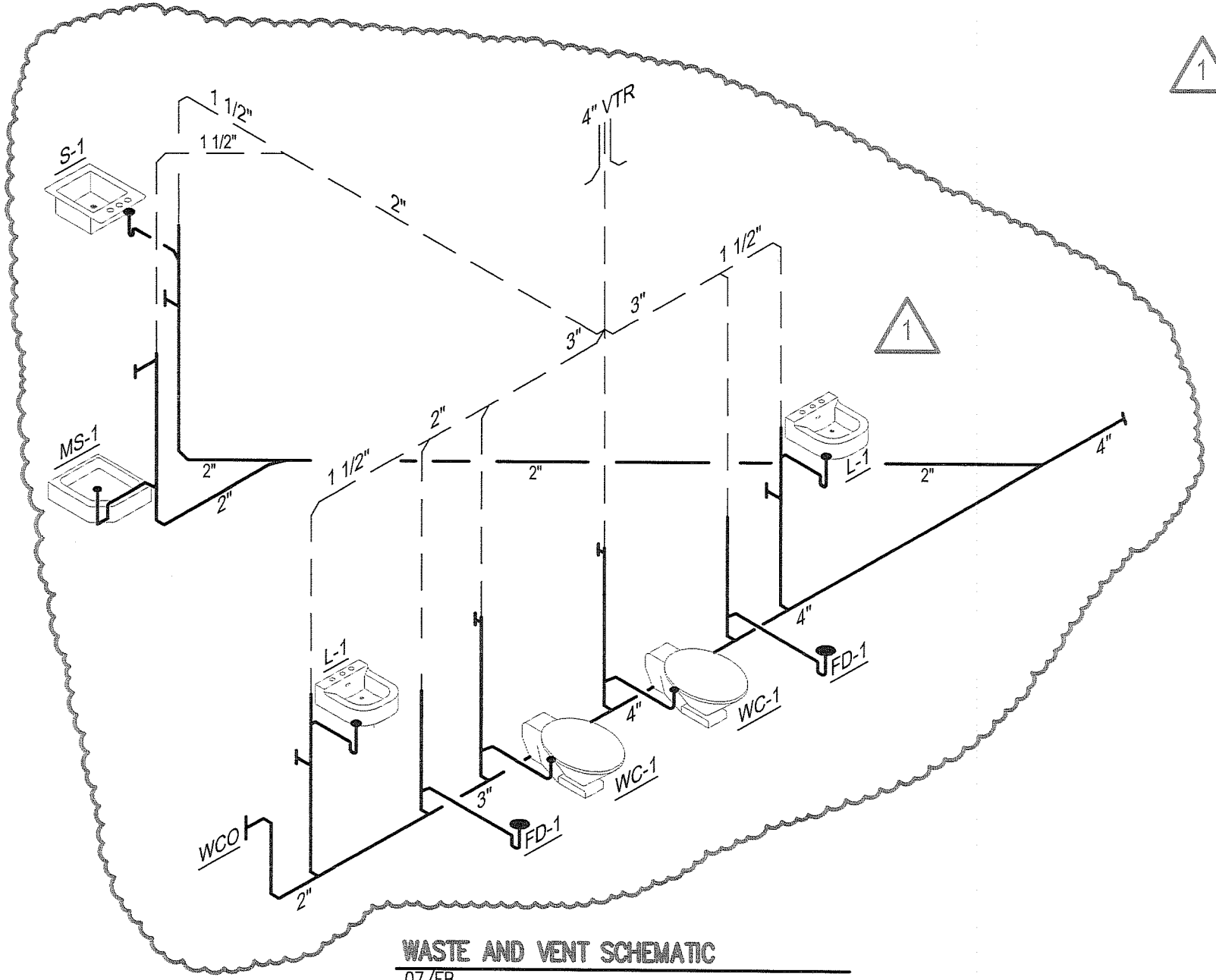
WRIGHT & PAIBIN W&P

NEW YSLETA ANNEX BUILDING

EL PASO, TEXAS - SOCORRO ROAD

REVISED PLUMBING SCHEMATIC

R4



WASTE AND VENT SCHEMATIC

07/EB

1 02-26-08
ATTACH TO SHEET
P3.00

07.02.19 YSLETA ANNEX

Consultant

Trinity consulting

DRAWING COORDINATION

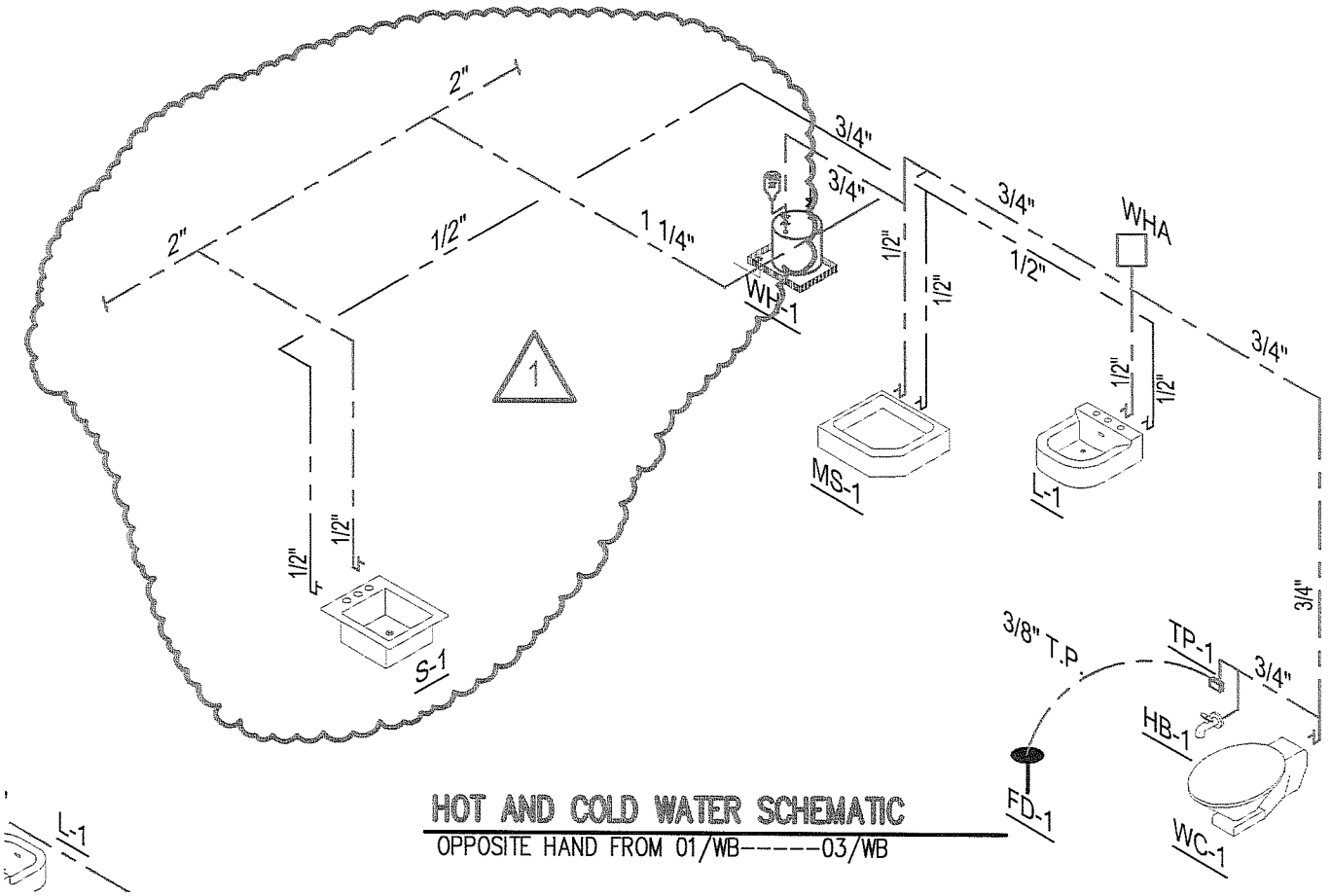
WRIGHT & DAUBIN

NEW YSLETA ANNEX BUILDING

EL PASO, TEXAS - SOCORRO ROAD

REVISED PLUMBING SCHEMATIC

R5



HOT AND COLD WATER SCHEMATIC

OPPOSITE HAND FROM 01/WB-----03/WB

L-1

1 02-26-08
ATTACH TO SHEET P3.01

07.02.10 YSLETA ANNEX

Consultant
Trinity Mconsulting

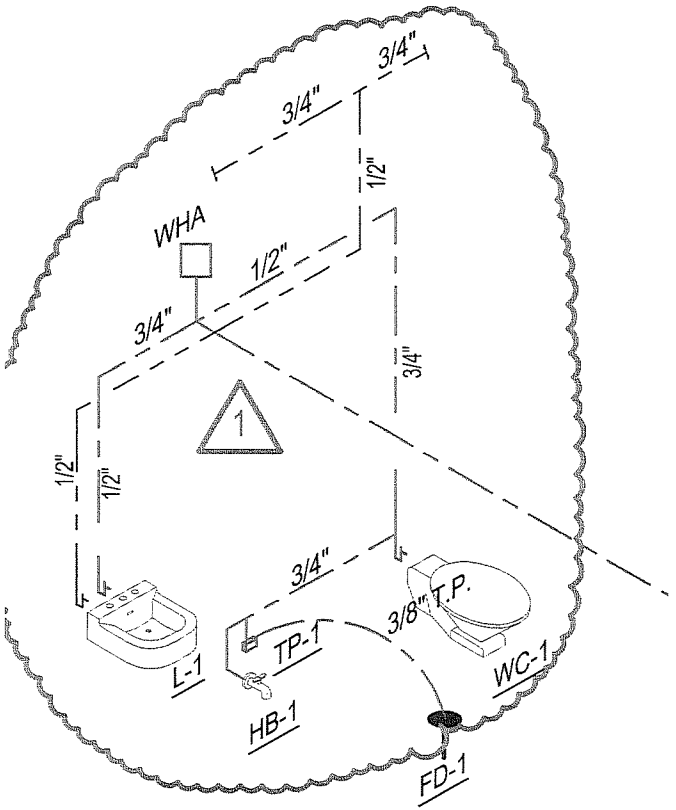
DRAWING COORDINATION

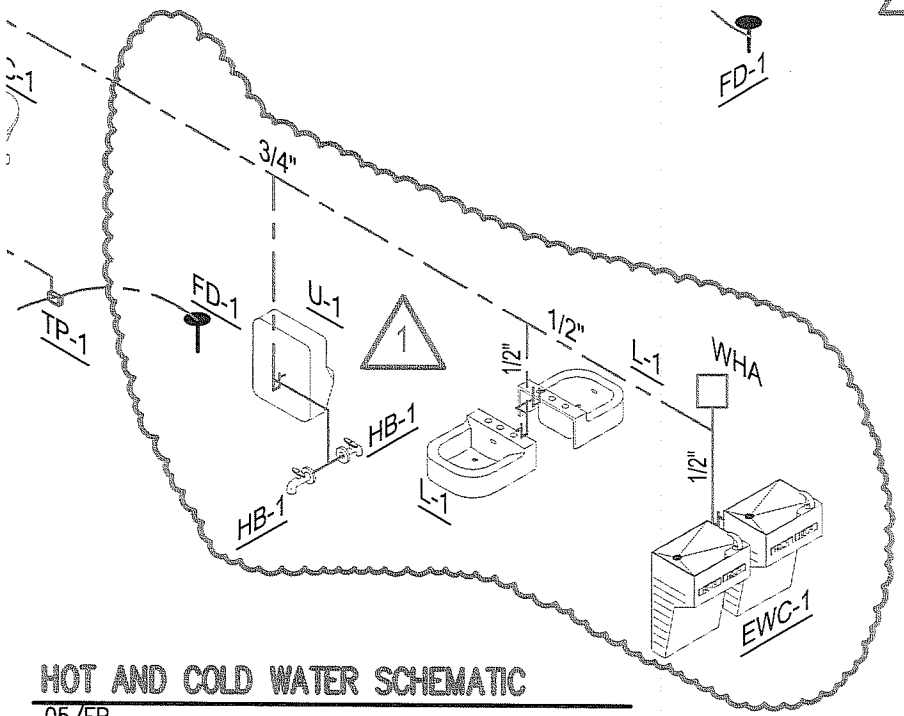
WRIGHT & DARBIN

NEW YSLETA ANNEX BUILDING
EL PASO, TEXAS - SOCORRO ROAD

REVISED PLUMBING SCHEMATIC

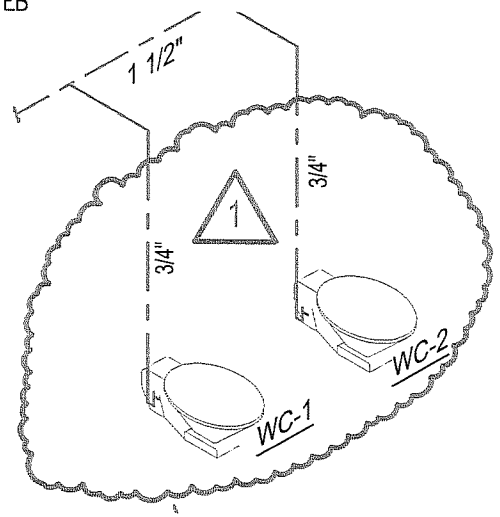
R6





HOT AND COLD WATER SCHEMATIC

05/EB



1 02-26-08
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07.02.19 YSLETA ANNEX

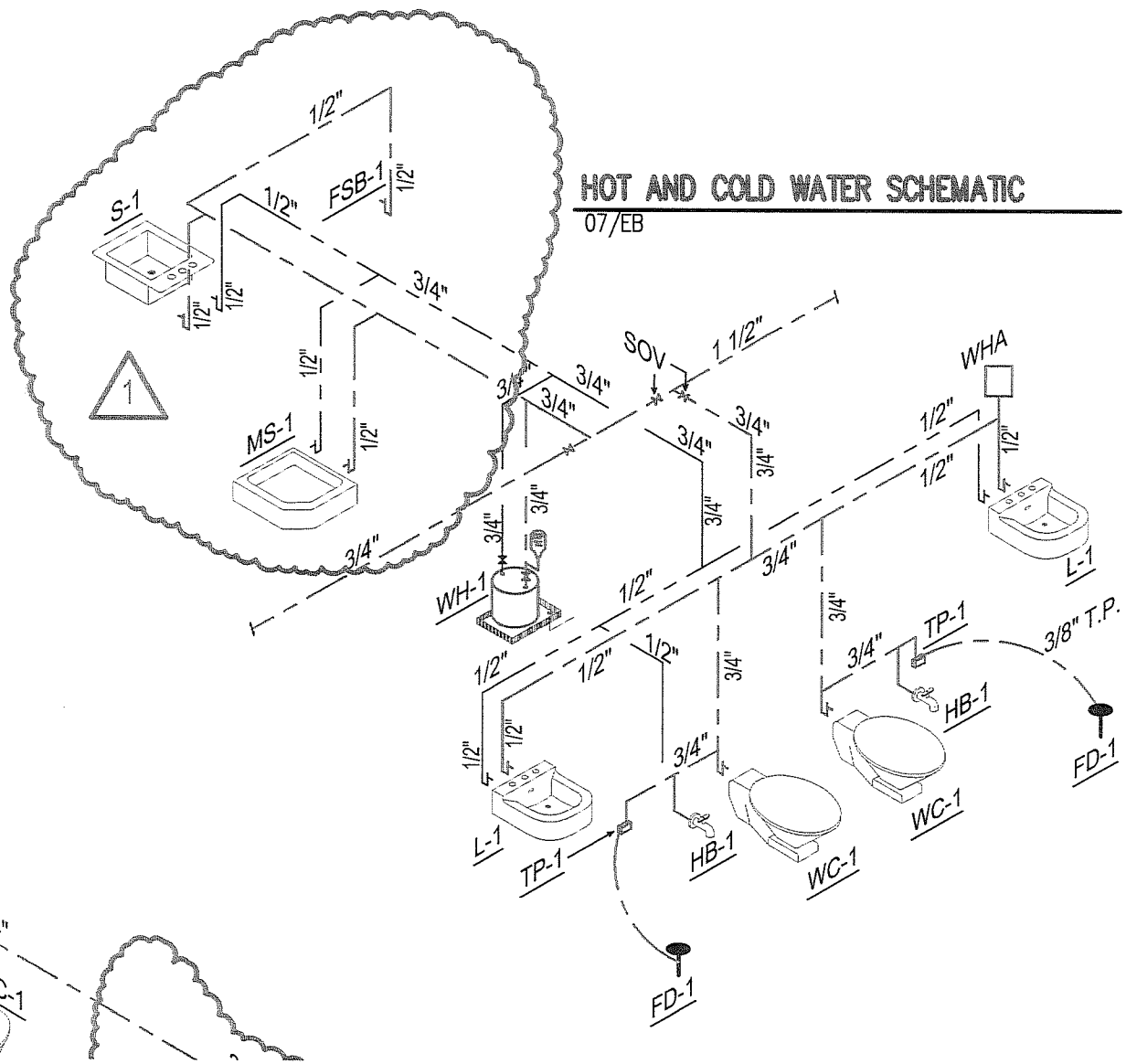
Consultant
Trinity consulting

DRAWING COORDINATION

NEW YSLETA ANNEX BUILDING
EL PASO, TEXAS - SOCORRO ROAD

REVISED PLUMBING SCHEMATIC

R7



HOT AND COLD WATER SCHEMATIC

07/EB

1 02-26-08
ATTACH TO SHEET
P3.01

07.02.10-YSLETA ANNEX

Trinity consulting

DRAWING COORDINATION

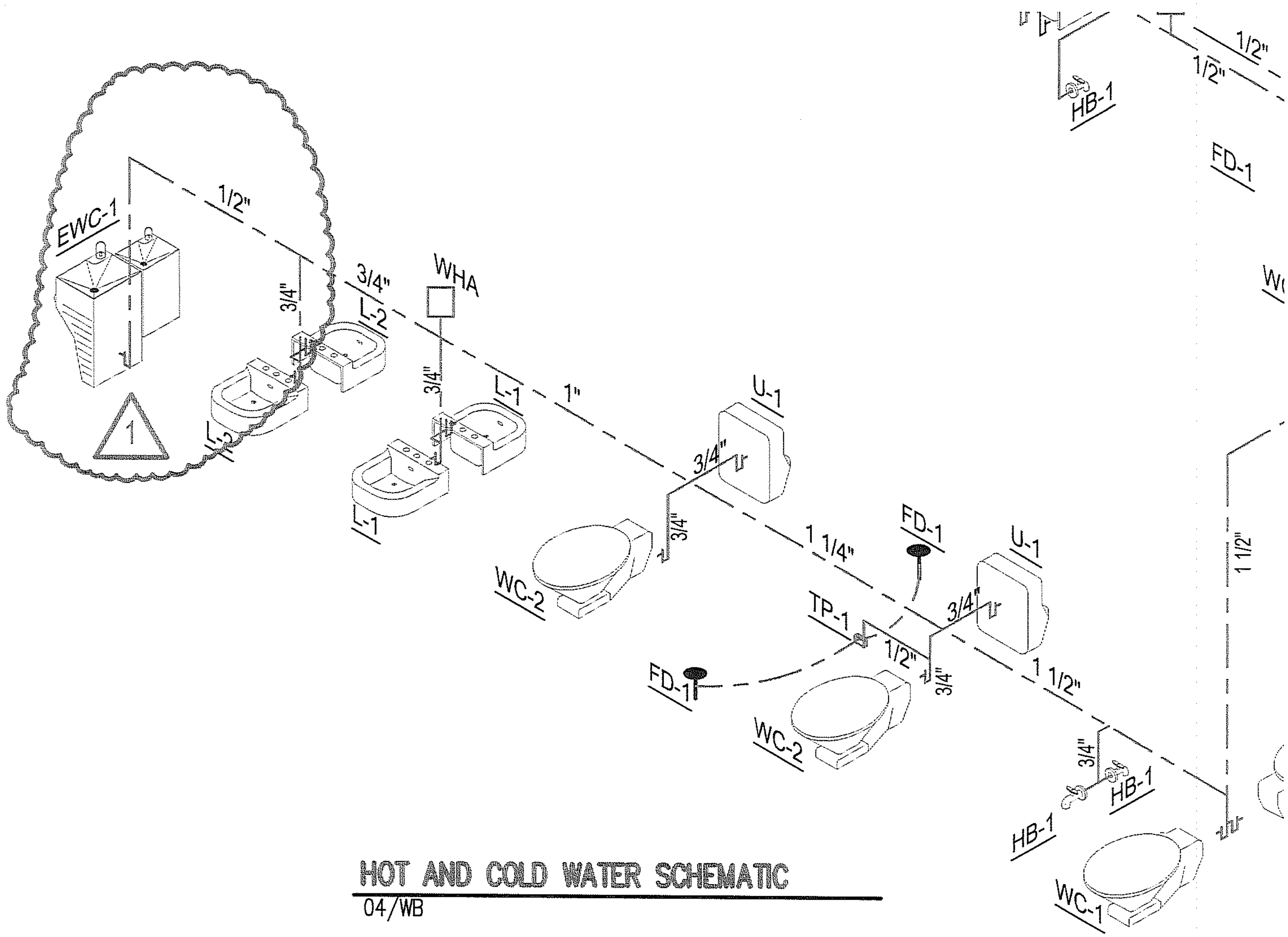
WRIGHT & DARDEN

NEW YSLETA ANNEX BUILDING

EL PASO, TEXAS - SOCORRO ROAD

REVISED PLUMBING SCHEMATIC

R8



HOT AND COLD WATER SCHEMATIC
04/WB

02-26-08
ATTACH TO SHEET
P3.01

07.02.10 YSLETA ANNEX

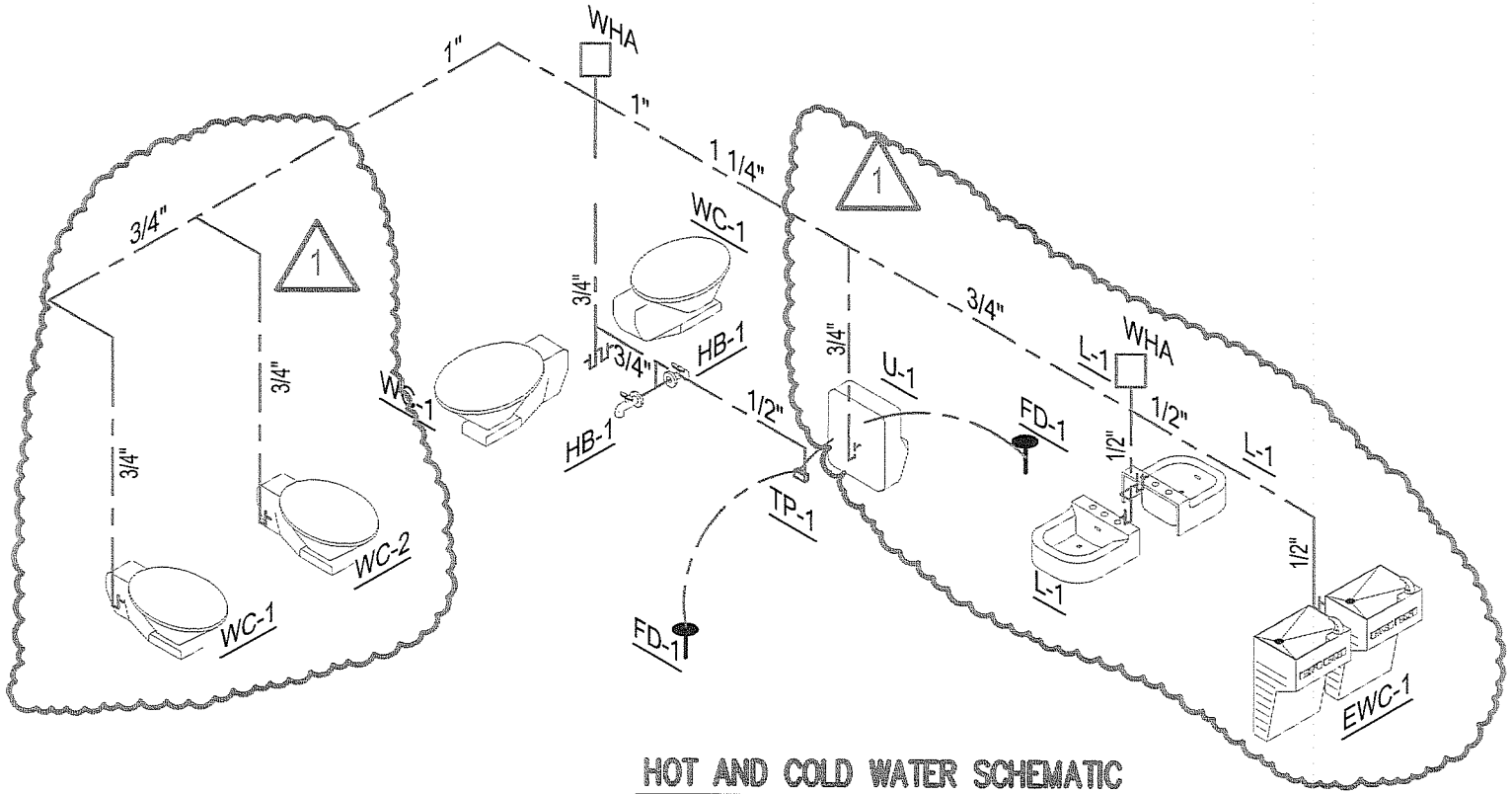
Trinity consulting

DRAWING COORDINATION

NEW YSLETA ANNEX BUILDING
EL PASO, TEXAS · SOCORRO ROAD

REVISED PLUMBING
SCHEMATIC

R9



HOT AND COLD WATER SCHEMATIC

06/EB

1 02-26-08
ATTACH TO SHEET P3.01

07.02.19 YSLETA ANNEX

Consultant

Trinity mconsulting

DRAWING COORDINATION

WRIGHT & DARBY

NEW YSLETA ANNEX BUILDING

EL PASO, TEXAS - SOCORRO ROAD

REVISED PLUMBING SCHEMATIC

R10

1 02-26-08
ATTACH TO SHEET
E5.01

07.02.10 YSLETA ANNEX

LIGHT FIXTURE SCHEDULE

O	MANUFACTURER #	# LAMPS/TYPE	MOUNTING	VOLTS	REMARKS
A	LITHONIA # RTS3080F POLE	400 W. MH	POLE	480	(2)#KVR2400MSYMC-RPVD09
B	LITHONIA # DMS248HOARDP	60 W. 800 mA	SIGN COVE	277	
C	LUMUX # LLF800MH100	100 W. MH	WALL	277	FLUSH MOUNT WITH WALL
D	LITHONIA # RSS85B POLE	250 W. MH	POLE	277	(1)#FKL3HPMYK
E	ANTIQUE # EM17STGCFSR2 ANBK	100 W. MH	WALL	277	EAL4WB ARM
F	LITHONIA # WST150MFT	100 W. MH	WALL	277	
G	LITHONIA # 2SPG332A12	3 F32 T8	LAY IN	277	
H	LITHONIA # 2SPG232A12	2 F32 T8	LAY IN	277	
I	LITHONIA # 2SPG2U31A12	2 U31 T8	LAY IN	277	
J	LITHONIA # AF218DTT6AR	2 18 DTT	RECESSED	277	
K	LITHONIA # LHQMSW3RN	-	WALL	277	SELF-CONTAINED
L	LITHONIA # ELM	-	WALL	277	SELF-CONTAINED
M	LUMUX # LLF800PL18	18 W. PL	WALL	277	FLUSH MOUNT WITH WALL,EMERGENCY BALLAST
N	LITHONIA # SPE232A12	2 F32 T8	FLUSH	277	
O	LITHONIA # LB232	2 F32 T8	SURFACE	277	

1

CABLE TRAY SCHEDULE

O	MANUFACTURER #	MATERIAL	RUNG SPACING	RUNG HEIGHT	LENGTH	TRAY WIDTH	REMARKS
CT	MONO-SYSTEMS INC. # 1234325	GALV. STEEL	12"	4"	12'	24"	PROVIDE ALL HANGERS SUPPORTS, CONNECTIONS, DEVICES, ETC. FOR A COMPLETE SYSTEM

Consultant
Trinity mconsulting

NEW YSLETA ANNEX BUILDING
EL PASO, TEXAS - SOCORRO ROAD

REVISED ELEC. SCHEDULE

RE1

FOR REGULATORY APPROVAL, PERMITTING, OR CONSTRUCTION

LICON ENGINEERING CO.

File No. P07212
October 22, 2007

Mr. Fred Dalbin, AIA
Wright & Dalbin Architects, Inc.
2112 Murchison
El Paso, Texas 79930

Re: Ysleta Annex Building Addition Complex
Geotechnical Engineering Study
El Paso, Texas

Dear Mr. Dalbin,

Thank you for the opportunity to present the enclosed geotechnical engineering report for the above referenced project. The information we are presenting herein describes the procedures utilized for field and laboratory investigation, along with the results of our study. It also includes our evaluation of the data obtained and geotechnical engineering recommendations for general site preparation, foundation bearing capacity values, subsurface soil pressure values, soil class data for stable slopes, and general guidelines for foundation construction.

It was a pleasure to work with you on this phase of your project, and we look forward to assisting you during the design and construction phases of this project. If you have any questions regarding the information we present herein, please call us.

Respectfully submitted,

LICON ENGINEERING CO., INC.

STATE OF TEXAS
GERARDO ALBERTO LICON
79169
10/22/07
LICENSED
PROFESSIONAL ENGINEER

Gerardo A. Licón, P.E.

Copies: Above (3)

J:\BGPROJ\P07214\Report folder\Yarbrough-MontanaWaterTransmissionline-cover letter.doc

2101 E. Missouri Ave
El Paso, TX 79903

www.lec-group.com

TEL. (915) 781-1LEC
FAX (915) 781-1190

TABLE OF CONTENTS

1.0 INTRODUCTION

We have completed the geotechnical engineering study for the design and construction of the addition of two new buildings to the Ysleta Annex located at the intersection of Socorro Road and Loop 375, in the Lower Valley of El Paso, Texas. We were authorized to conduct this study by Mr. Fred Dalbin, AIA, representing our client, Wright and Dalbin Architects, Inc.

2.0 PROJECT DESCRIPTION AND OBJECTIVE

The project consists of the design and construction of the addition of two new buildings to the Ysleta Annex located at the intersection of Socorro Road and Loop 375, in the lower valley of El Paso, Texas. The planned buildings will be single-story structures with a total approximate area of 24,000 square feet, consisting of a concrete slab and concrete masonry unit (CMU) walls. The development includes parking areas for light vehicular traffic with a maximum of 110 parking spaces.

This report includes recommendations for general site preparation, foundation design recommendations, flexible pavement recommendations, and general guidelines for foundation and pavement construction.

3.0 ENGINEERING INVESTIGATION

3.1 Field Exploration

In the field exploration phase of the study, we drilled twelve soil borings to a maximum depth ranging from 5 feet to 20 feet within the subject property. We drilled the borings in general accordance with ASTM D 6151 and D 1586 procedures, using a truck-mounted CME-75 rig. The boring locations are shown in the Boring Plan included in the Appendix as Sheet A-1.

We prepared a log of each boring to delineate the soil strata studied at the site. The boring logs have approximate horizontal and vertical controls. Horizontal coordinates are in SI units, and are given in a decimal degree format. These values were obtained by using a Global Positioning System (GPS) device.

The boring logs are included in the Appendix as Sheets A-2 through A-13. A key to soil terminology and soil symbols is included in Sheets A-16 and A-17, respectively.

We conducted a total of thirty nine (39) Standard Penetration Tests (SPT) at representative soil strata in the borings to determine the relative density or consistency of the resident soils.

Standard Penetration Tests (SPT) conducted at each representative soil strata in the borings were used to determine the relative density or consistency of the resident soils. The SPT is a widely recognized procedure

that provides a numerical value of the soil strata being tested, indicating the number of blows that it takes for a standard 140-pound weight hammer with a standard 30-inch free fall drop to penetrate 12 inches into the soil. The SPT values for the soil strata in the borings are included in the boring logs.

As part of our field exploration, we collected representative soil samples from the borings at regular depth intervals using a standard two-inch outside diameter split spoon sampler. We identified and labeled the samples according to boring number and depth, visually classifying them, and placing them in moisture-proof containers for transportation to the laboratory for further evaluation and testing.

Unless we receive prompt notification from the client, the samples collected from the field investigation will be in storage in our laboratory for a period of 30 days from the date of this report, after which time we will discard the samples.

3.2 Geotechnical Laboratory Testing

In the laboratory, we determined the moisture content, percent passing the No. 200 sieve, and Atterberg Limits of selected samples. We conducted these tests to determine the physical and engineering properties of representative soils at the site. These tests also allowed us to properly classify the native soils in accordance with the Unified Soil Classification System (USCS). The results of our tests are included in the boring logs, adjacent to the depth at which the samples were recovered.

We also conducted on California Bearing Ration (CBR) test to determine the inundated strength of a representative roadbed soil specimen. Results of the CBR test are included in sheet A-15 in the Appendix. The soil specimen was molded and compacted using the moisture-density data included in Sheet A-14 in the Appendix.

4.0 GENERAL SITE CONDITIONS

4.1 Area Geology

The project site is located at the intersection of Socorro Road and Loop 375, in the lower valley of El Paso, Texas. According to the Soil Conservation Service of El Paso County, the soils in this area correspond to the Harkey-Glendale association, which is described as deep, nearly level soils that have very fine loamy sand soils to silty clay loamy soils, in the Rio Grande flood plain.

4.2 Site Topography

The proposed project site for the Ysleta Annex building addition project is relatively level.

4.3 Site Vegetation

The proposed project site has vegetation consistent of small bushes typical of the climate of that area throughout the surface.

4.4 Soil Stratigraphy

The soils we encountered in the borings can be divided into three generalized soil strata as follows:

Stratum A, consisting of fine grained silty sand, is encountered in borings 1, 2, 6 and 7, from ground surface elevation to the maximum depth drilled ranging from 10 feet to 16 ½ feet. This soil ranges is dry to moist, light brown to brown, at a loose to medium dense relative density, and can be classified as SM in accordance with the USCS.

Stratum B, consisting of clayey sand soils, is encountered in borings 3, 4, 5, 8, 10 and 12, from ground surface elevation to a maximum depth drilled ranging from 5 feet of 20 feet. These soils range are moist to wet, light brown to brown and at a soft to very stiff relative density. These soils can be classified as CL in accordance with the USCS. A representative sample from this stratum has a maximum liquid limit of 38 and a maximum Plasticity Index of 21.

Stratum C, consisting of silty soils, is encountered in borings 9 and 11, from ground surface elevation to a maximum depth drilled of 5 feet. These soils are moist, and at a firm relative density, light brown. Soils in this stratum can be classified as ML in accordance with the USCS.

4.5 Groundwater

Groundwater was encountered in borings 1, 2, 4, 5 and 6, during the time of our field exploration. The groundwater table at the site was encountered at an approximate depth of 16.5 feet.

5.0 ENGINEERING EVALUATION

5.1 Site Preparation

The soils in Stratum B and Stratum C are not suitable for use as structural fill material. We recommend having these soils excavated and replaced with structural fill material as described in section 5.6 of this report.

Based on the soil conditions described in section 4.4 above, we recommend a foundation system consisting of shallow spread and/or continuous footings.

We recommend that the shallow foundation system be supported on a minimum of 24 inches of compacted structural fill or compacted subgrade soils that meet the criteria for structural fill. Floor slabs should be built on a minimum of 24 inches of compacted structural fill or compacted subgrade soils that meet the criteria for structural fill.

Depending on the site grading and drainage plans, it may be necessary to sub-excavate the subgrade soils to accommodate the required thickness of structural fill. The horizontal limits of soil excavation should extend a minimum of 24 inches beyond the edge of the foundation and slab line.

The surface on which the foundation or floor slab structures will be placed should be scarified and organic matter completely removed prior to foundation and slab construction.

Subgrade soils should be cleared of vegetation, organic matter, and deletereous substances. The surface should be scarified, moisture conditioned, and compacted to a minimum 95 percent of ASTM D1557.

We calculated the Potential Vertical Rise (PVR) of a theoretically dry soil profile, in accordance with Texas Department of Transportation (TxDOT) method Tex 124-E. The PVR value is 1/3 inches. This value confirms that these clay soils have a low to moderate shrink/swell potential.

5.2 Foundation Recommendations

Individual spread and/or continuous footings may be dimensioned using a net allowable bearing capacity of 1,400 pounds per square foot, with a minimum footing width of 18 inches. Footings should bear at a minimum depth of 12 inches below the lowest adjacent finished grade, on a minimum of 24 inches of compacted structural fill or compacted subgrade soils that meet the criteria for structural fill.

The above recommended foundation system should experience a total settlement less than one inch. The foundation system designed in accordance with the above criteria considers a factor of safety of 3.

Positive surface drainage should be provided during and after construction by sloping the ground surface a minimum of two percent graded away from the foundation structures for a minimum distance of 20 feet. Ponding of water, including irrigated planters should not be allowed adjacent to the structures. Ponding areas should be located a minimum distance of 20 feet away from the structures. Underground water and sewer lines should be avoided underneath the structures to reduce the possibility of moisture infiltration in the event of plumbing leaks.

5.3 Flexible Pavement Recommendations

We understand the parking areas and driveways contemplated in this project will be constructed using a flexible pavement structure. We used traffic loading of 269,000 equivalent single-axle load (ESAL) applications. This parameter is estimated based on average daily light automobile traffic. For comparative purposes, the following table shows the assumed ESAL value for the pavement structure in relation to the parameters used in the design procedure included in the *Subdivision Ordinance of the City of El Paso, Texas* for city dedicated streets.

PAVEMENT THICKNESS DESIGN PROCEDURE			
Street Classification	**Aver. Daily Traffic E.A.L (20 yrs)**	**Roadway Width (ft)**	**R.O.W Width (ft)**
Major Residential Access	500 (45,000)	28	44
Ysleta Annex Buildings Addition	(269,000)	N/A	N/A
Residential sub-collector	3,000 (269,000)	36	52

A California Bearing Ratio (CBR) value of 9 was used for pavement design calculations. This value was obtained from one CBR test conducted on a representative roadbed soil sample

Flexible pavements for the parking areas and driveways in this project should consist of the minimum thickness recommendations as follows:

Equivalent Single-Axle Load (20 years) = 269,000

Design CBR Value = 9

Pavement Component	***Minimum Thickness (inches)***
Hot Mix Asphaltic Concrete	1 ½
Crushed Stone Base Course	6
Compacted Structural Fill	8

The Crushed Stone Base Course (CSBC) should be Item 247, Type A, Grade 2 in accordance with the Texas Department of Transportation (TxDOT) Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges. CSBC materials should be placed in loose lifts not exceeding 6 inches in compacted thickness, and compacted to a minimum 100 percent of maximum dry density and a moisture content within plus or minus 2 percent, in accordance with ASTM D 1557.

The HMAC material should conform to Item 340, Type D, in accordance with the above reference standard. The HMAC mix should have a minimum 1500 pounds of Marshall stability, when compacted at 75 blows in accordance with ASTM D 1559, and should have a flow between 8 and 16. The HMAC course should be placed at a target density of at least 98 percent.

5.4 Rigid Pavement Recommendations

A rigid pavement section may be required in some sections subjected to heavy-duty vehicular traffic. Based on our rigid pavement design calculations and the traffic loading conditions used to generate the flexible pavement sections, a jointly reinforced concrete slab with a thickness of 7 inches will be able to support a traffic loading of 1,500,000 equivalent single-axle load (ESAL) applications considering concrete with a minimum 28-day compressive strength of 3000 psi.

The jointed-reinforced concrete slab should be built on a minimum of 24 inches of compacted structural fill or subgrade soils that meet the criteria for structural fill material

5.5 Floor Slabs

Floor slabs should be built on a minimum of 42 inches of compacted structural fill or compacted subgrade soils that meet the criteria for structural fill. A modulus of subgrade reaction of 150 pcf should be used in the design of concrete floor slabs.

5.6 Structural Fill

The structural fill material or native subgrade soils used to support the foundation system or pavement structures should be granular, cohesion-less, and free of deleterious material and particles over 4 inches in greatest dimension. Soils proposed for use as fill materials should be classified in accordance with ASTM D 2487. The following soils classified in accordance with the Unified Soil Classification System (USCS) can be considered satisfactory for use as structural fill.

> GM, GC, GW-GM, GW-GC, GP-GM and GP-GC, SM, SC, SW-SM, SW-SC, SP-SM, SW-SC and SC-SM.

The following USCS-classified soils are not considered satisfactory for use as structural fill.

> CH, CL, MH, ML, OH, OL and PT, or soils that exceed a liquid limit of 40 and a plasticity index of 15.

The soils in Stratum A are suitable for use as structural fill based on the above criteria. Soils in Strata B and C are not considered suitable for use as structural fill, based on the above criteria.

Structural fill should be placed in uniform layers not exceeding 8 inches in compacted thickness, moisture-conditioned to add the amount of moisture required for optimum compaction and compacted to a minimum of 95 percent of maximum density in accordance with ASTM D1557 (modified Proctor) procedures. The moisture content should be at plus or minus 3 percent of optimum moisture content in accordance with ASTM D1557. This compaction requirement also applies to the subgrade soils that will receive structural fill.

Compaction of the fill material and subgrade soils should be conducted with approved types of pneumatic, power or tamping equipment. Determination of density in the field should be conducted in accordance with ASTM D2922 or D1556.

6.0 ADDITIONAL CONSIDERATIONS

6.1 Construction Monitoring

We recommend that the client retain the geotechnical engineer (Licon Engineering Co., Inc.) during the construction phase of this project to verify the findings of our geotechnical engineering study, and to provide supplemental recommendations to this study in the event that site conditions vary from those described in this report.

The geotechnical engineer should observe the pipeline installation work to verify that the soils encountered in the excavations are similar to those reported in our boring logs.

The geotechnical engineer should also conduct testing of fill materials at the rate of three field densities per each lift of fill, one per 2500 square feet of fill, or one per 300 lineal feet of pipe installation, whichever yields the larger number of tests, in accordance with ASTM D2922 or D1556. Additionally, one moisture-density curve should be obtained for each type of material used in accordance with ASTM D1557, and one sieve analysis and one plasticity index for each type of imported material used, according to ASTM C136, and D4318.

6.2 Limitations

We have performed our professional services, have obtained the data presented in this report, and have prepared our recommendations in accordance with generally accepted engineering principles and practices. Our conclusions and recommendations are based on the data obtained from twelve test borings and laboratory testing conducted on representative samples and on our knowledge of the project conditions at the time of our geotechnical engineering study.

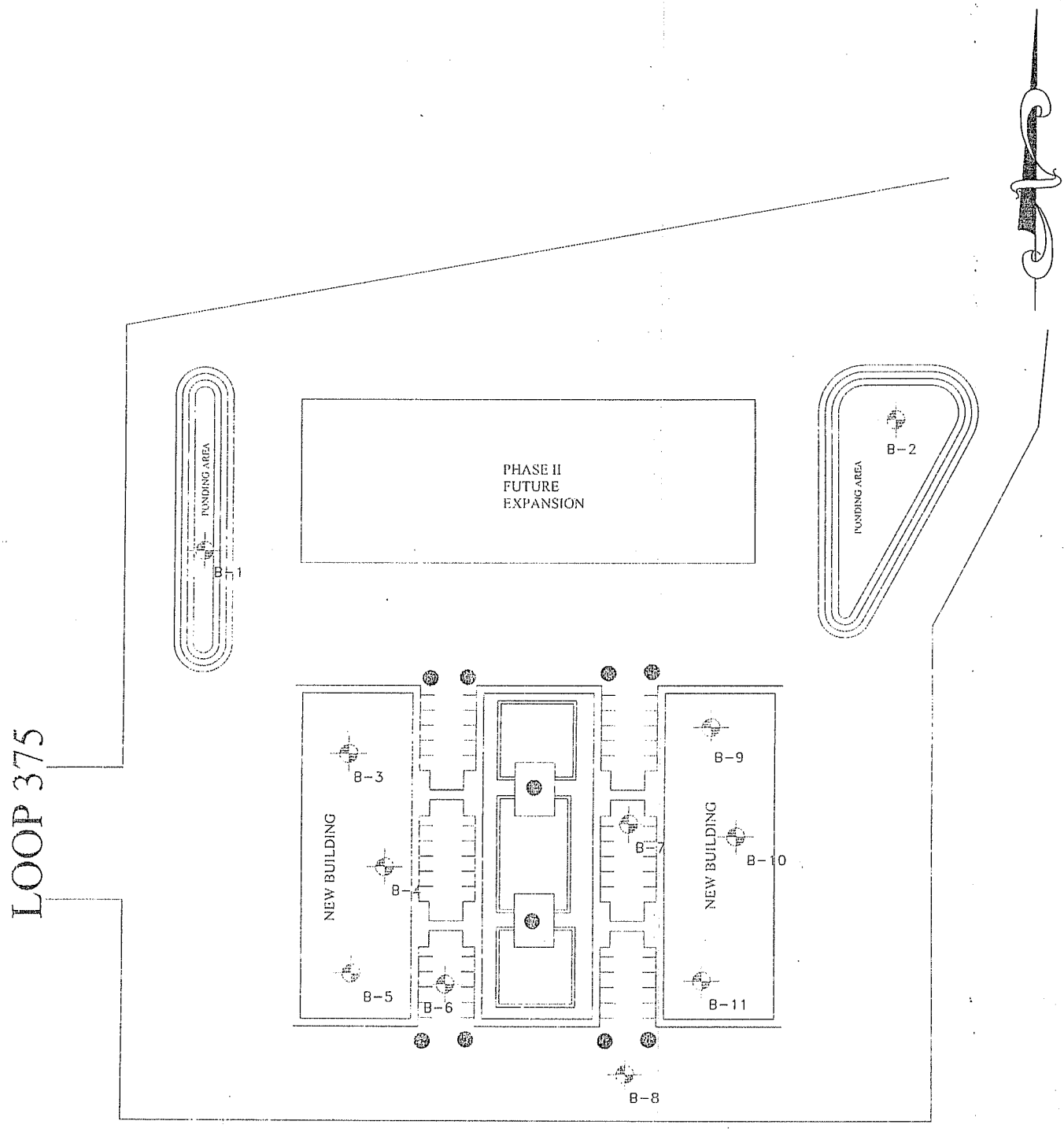
The data in this report reflects subsurface soil conditions only at the specific sampling locations, time of sampling, and to the depths indicated in our report.

We recommend that the client notify Licon Engineering Co., Inc. of any changes to the project conditions considered in this report, so that we may provide pertinent modifications to our recommendations if deemed necessary.

Additionally, once construction commences, we should be notified of any unusual site conditions that appear to vary from those reported herein, so that we may conduct further investigations and prepare supplemental recommendations if deemed necessary.

We conducted this investigation for the purpose of defining the subsurface soil conditions at the site for the design and construction for the addition of the new Ysleta Annex Buildings project. Use of this information for projects other than the one described herein will not be adequate.

APPENDIX



KEY

B-1 APPROXIMATE BORING LOCATION AND NUMBER

LICON ENGINEERING Co.

DRAWING TITLE
BORING PLAN

PROJECT NAME
YSLETA ANNEX
BUILDING ADDITION

DRAWN BY	REVIEWED BY	APPROVED BY	SCALE
J.C.V.	F.C.	G.A.L.	N.T.S.
PROJECT No.	FILE NAME	DATE	SHEET No.
P07212	YSLETA ANNEX BUILDING ADDITION	10/08/07	A-1

LOG OF TEST BORING No. 1

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6769 degrees N 106.3147 degrees W
Surface elevation: 3680 feet.
Date drilled: 10/04/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symboi	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
3680 0			SAND, fine grained, silty, brown, loose, moist.		7.1	26.0	NV	NV	NP	5	
3675 5			-medium dense from 5 feet to 10 feet	SM						15	
3670 10			-loose from 10 feet to 15 feet							7	
3665 15			-medium dense below a5 feet							21	
			Termination Depth at 16.5 feet								
3660 20											
3655 25											
3650 30											

Groundwater Table Data

Depth	Date	Time
16.5	10/04/07	

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-2

LOG OF TEST BORING No. 2

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6772 degrees N 106.3150 degrees W
Surface elevation: 3684 feet
Date drilled: 10/04/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
0			SAND, fine grained, silty, brown, loose, moist.	SM	3.9	26.0	NV	NV	NP	5	
3680 5			-medium dense from 5 feet to 10 feet							17	
3675 10			-loose below 10 feet							8	
3670 15										5	
			Termination Depth at 16.5 feet								
3665 20											
3660 25											
3655 30											

Groundwater Table Data

Depth	Date	Time
16.5	10/04/07	
N/A		

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-3

LOG OF TEST BORING No. 3

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6772 degrees N 106.3147 degrees W
Surface elevation: 3687 feet
Date drilled: 10/04/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
0 / 3685			CLAY, light brown, soft, wet.	CL	25.7	80.0	23	16	7	7	
5 / 3680			-stiff from 5 feet to 15 feet.							13	
10 / 3675										13	
15 / 3670										7	
20 / 3665			Termination Depth at 20 feet							8	
25 / 3660											
30											

Groundwater Table Data

Depth	Date	Time
N/A		
N/A		

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-4

LOG OF TEST BORING No. 4

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6766 degrees N 106.3141 degrees W
Surface elevation: 3702 feet
Date drilled: 10/04/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
0 / 3700			CLAY, light brown, stiff, wet.	CL	9.7	90.0				11	
5 / 3695										13	
10 / 3690										13	
15 / 3685										9	
			Termination Depth at 16.5 feet								
20 / 3680											
25 / 3675											
30											

Groundwater Table Data

Depth	Date	Time
16.5 feet	10/04/07	

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-5

LOG OF TEST BORING No. 5

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6766 degrees N 106.3141 degrees W
Surface elevation: 3695 feet
Date drilled: 10/04/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
3695 0			CLAY, light brown, stiff, wet.	CL	11.0	62.0	38	17	21	9	
3690 5										14	
3685 10			-very stiff from 10 feet to 15 feet							19	
3680 15										9	
			Termination Depth at 16.5 feet								
3675 20											
3670 25											
3665 30											

Groundwater Table Data

Depth	Date	Time
16.5 feet	10/04/07	

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-6

LOG OF TEST BORING No. 6

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6819 degrees N 106.3013 degrees W
Surface elevation: 3665 feet
Date drilled: 10/04/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
3665 0			SAND, fine grained, silty, brown, loose , moist.	SM	9.3	6.0	NV	NV	NP	6	
3660 5										6	
3655 10			-tan below 10 feet							5	
3650 15										6	
			Termination Depth at 16.5 feet								
3645 20											
3640 25											
3635 30											

Groundwater Table Data

Depth	Date	Time
16.5 feet	10/04/07	

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-7

LOG OF TEST BORING No. 7

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6769 degrees N 106.3127 degrees W
Surface elevation: 3651 feet
Date drilled: 10/04/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
3650 (0)			SAND, fine grained, silty, light brown, medium dense, dry.	SM	3.3	5.0	NP	NP	NV	17	
3645 (5)			-loose below 8.5 feet							11	
3640 (10)			Termination Depth at 10 feet							8	
3635 (15)											
3630 (20)											
3625 (25)											
(30)											

Groundwater Table Data

Depth	Date	Time
N/A		
N/A		

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-8

LOG OF TEST BORING No. 8

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6767 degrees N 106.3141 degrees W
Surface elevation: 3666 feet
Date drilled: 10/05/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value CURVE (10 30 50)
3665 / 0			CLAY, light brown, very stiff, moist.	CL	6.7	86.0				17	
5 / 3660			-stiff from 5 feet to 8.5 feet							11	
			-firm below 8.5 feet							8	
10 / 3655			Termination Depth at 10 feet								
15 / 3650											
20 / 3645											
25 / 3640											
30											

Groundwater Table Data

Depth	Date	Time
N/A		
N/A		

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-9

LOG OF TEST BORING No. 9

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6766 degrees N 106.3143 degrees W
Surface elevation: 3684 feet
Date drilled: 10/05/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
0											
			SILT, light brown, firm, moist.	ML	10.3	63.0	NV	NV	NP	8	
3680			-stiff below 3.5 feet							13	
5			Termination Depth at 5 feet								
3675											
10											
3670											
15											
3665											
20											
3660											
25											
3655											
30											

Groundwater Table Data

Depth	Date	Time
N/A		
N/A		

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-10

LOG OF TEST BORING No. 10

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6766 degrees N 106.3147 degrees W
Surface elevation: 3695 feet
Date drilled: 10/05/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
3695 0											
			CLAY, light brown, firm, moist.	CL	14.2	61.0	23	7	16	6	
			-stiff below 3.5 feet							14	
3690 5			Termination Depth at 5 feet								
3685 10											
3680 15											
3675 20											
3670 25											
3665 30											

Groundwater Table Data

Depth	Date	Time
N/A		
N/A		

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-11

LOG OF TEST BORING No. 11

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6769 degrees N 106.3152 degrees W
Surface elevation: 3680 feet
Date drilled: 10/05/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
3680 0											
			SILT, light brown, firm, moist.	ML	14.3	69.0	NV	NV	NP	7	
			-stiff below 3.5 feet							12	
3675 5			Termination Depth at 5 feet								
3670 10											
3665 15											
3660 20											
3655 25											
3650 30											

Groundwater Table Data

Depth	Date	Time
N/A		
N/A		

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

Sheet No. A-12

LOG OF TEST BORING No. 12

Project name: Ysleta Annex Building Addition
File No.: P07212
Boring location: 31.6763 degrees N 106.3150 degrees W
Surface elevation: 3691 feet
Date drilled: 10/05/07

LICON ENGINEERING CO.

Elevation and Depth (ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value: Blows per foot (N)	SPT N-Value: CURVE (10 30 50)
0 / 3690			CLAY, brown, firm, moist.	CL	12.3	62.0				7	
5 / 3685			Termination Depth at 5 feet							6	
10 / 3680											
15 / 3675											
20 / 3670											
25 / 3665											
30											

Groundwater Table Data

Depth	Date	Time
N/A		
N/A		

Sample Type
- Auger cutting
- 2" O.D. split spoon
- 3" O.D. split tube
- Thin-walled Shelby tube

Rig type: CME-75
Boring type: 5 1/2" O.D. Hollow
Logger: F.C.

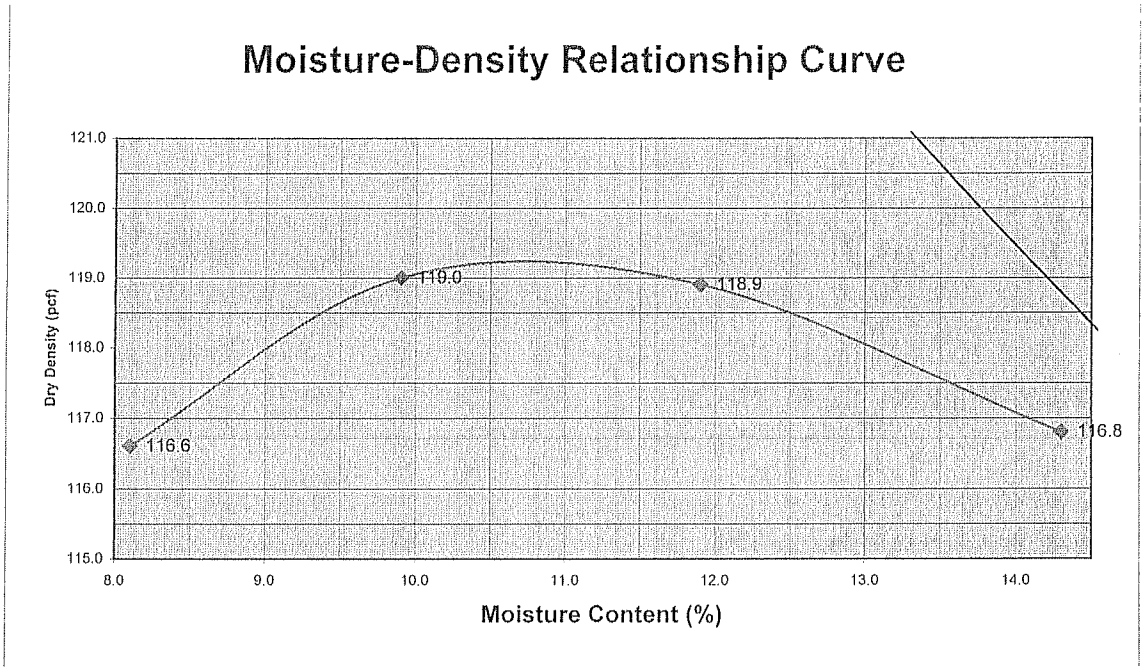
Sheet No. A-13

REPORT OF MOISTURE-DENSITY RELATIONSHIP, SIEVE ANALYSIS, AND PLASTICITY INDEX

Project Name: Ysleta Annex Building Addition
Project Number: P07212
Client: Wright & Dalbin Architects, Inc.
Sample Date: 10/04/07
Sample Location: Boring 3
Soil Classification (ASTM D2487): Clayey sand, (SC)
Sample Number:

Moisture-Density Relationship (in general accordance with ASTM D 1557)
Method Used: B
Preparation: Dry
Rammer: Mechanical
Specific Gravity: 2.62 (estimated)
As Received Water Content: n/a

Modified Maximum Dry Unit Weight: 119.2 pcf
Modified Optimum Water Content: 10.8 %



CALIFORNIA BEARING RATIO TEST

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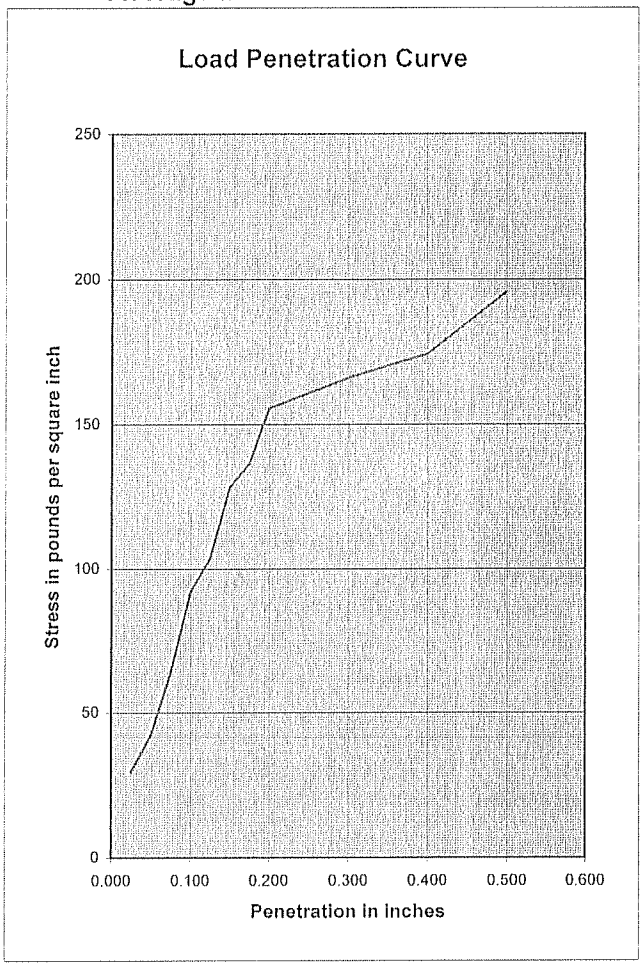
Project Name: Ysleta Annex Building Addition
Project Number: P07212
Sample Date: 10/04/07
Sample Location: Boring 3
Soil Description: Brown clayey sand, (SC)

MOISTURE-DENSITY DATA:
ASTM Test Method: ASTM D-1557
Max. dry density: 119.2 pounds per cubic foot
Unit weight before: 121.1 pounds per cubic foot
Unit weight after: 118.9 pounds per cubic foot
Swell index: N/A

Sample condition: Soaked/unsoaked
Optimum moisture content: 10.8%
Moisture content before: 11.9%
Moisture content after: 13.0%
Top 1in. layer moisture after 12.9%
Average moisture after: 11.6%

CBR TEST DATA:

Penetration inches	Load lbs.	Stress psi
0.025	90	30
0.050	128	42
0.075	195	64
0.100	280	92
0.125	315	104
0.150	390	128
0.175	415	137
0.200	473	156
0.300	505	166
0.400	530	174
0.500	595	196



Corrected 0.1 inch penetration: N/A
Corrected 0.2 inch penetration: N/A

CBR Value at 0.1 inch: 9
CBR Value at 0.2 inch: 10

This test was performed in general accordance with ASTM D 1883-99 "Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils"

SOIL TERMINOLOGY

COARSE GRAINED SOILS: More than 50 percent retained on No. 200 sieve. Includes fine, medium, or coarse grained (depending on grain size) gravel and sand, and silty and/or clayey gravel and sand. Density is described according to relative density measured in the laboratory, or sampler resistance in the field as follows:

Penetration Resistance* (Blows per Foot)	Descriptive Term	Relative Density** (Percent)
0 - 10	Loose	0 - 40
10 - 30	Medium Dense	40 - 70
30 - 50	Dense	70 - 90
More than 50	Very Dense	90 - 100

* From Standard Penetration Test with 140-pound hammer, 30 inch drop.

** From relative density tests on undisturbed sand sample.

FINE GRAINED SOILS: More than 50 percent passing through the No. 200 sieve. Includes organic and inorganic silt and clay, gravelly and/or sandy silt and clay, silty clay, and clayey silt. Consistency is described according to shear strength, from unconfined compression tests in the laboratory, penetrometer tests in the field or laboratory, or sampler resistance in the field as follows:

Compressive Strength* (Tons per Square Foot)	Descriptive Term	Penetration Resistance** (Blows per Foot)
Less than 0.25	Very Soft	Less than 2
0.25 - 0.50	Soft	2 - 4
0.50 - 1.00	Firm	5 - 8
1.00 - 2.00	Stiff	9 - 15
2.00 - 4.00	Very Stiff	16 - 50
4.00 and higher	Hard	50 and higher

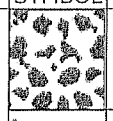
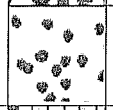
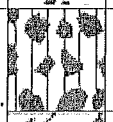
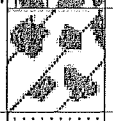
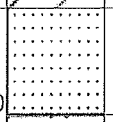
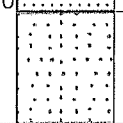
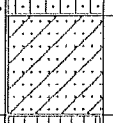
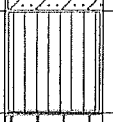
* From unconfined compression strength test.

** From Standard Penetration Test with 140-pound hammer, 30 inch drop.

Slickensided: With inclined planes of weakness of slick and glassy appearance.
Fissured: With shrinkage cracks that are frequently filled with fine sand.
Laminated: With thin layers of varying colors and texture.
Interbedded: With alternate layers of different soil types.
Calcareous: With noticeable quantities of calcium carbonate.
Sensitive: Applies to cohesive soils that are subject to loss of strength when remolded.
Well graded: With wide range in grain sizes and good distribution of intermediate particle sizes.
Poorly graded: With one predominant grain size, or a poor distribution with intermediate sizes missing.

SOIL SYMBOLS

Identification of the major soil divisions used to distinguish the change of a different stratum. For their combinations and a more detailed description, see UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487-00)

MAJOR SOIL DIVISIONS			SOIL SYMBOL	USCS SYMBOL	TYPICAL NAME
Coarse-Grained Soils (< 50% pass No. 200 sieve)	GRAVELS (<50% pass No. 4 sieve)	Clean Gravels (< 5% pass No. 200 sieve)		**GW**	Well-Graded Gravels
				**GP**	Poorly-Graded Gravels
		Gravels with fines (> 12% pass No. 200 sieve)		**GM**	Silty Gravels
				**GC**	Clayey Gravels
	SANDS (> 50% pass No. 4 sieve)	Clean Sands (< 5% pass No. 200 sieve)		**SW**	Well-Graded Sands
				**SP**	Poorly-Graded Sands
		Sands with fines (> 12% pass No. 200 sieve)		**SM**	Silty Sands
				**SC**	Clayey Sands
Fine-Grained Soils (> 50% pass No. 200 sieve)	SILTS	Silts of Low Plasticity (*LL < 50)		**ML**	Inorganic Silts (slightly plastic)
		Silts of High Plasticity (*LL > 50)		**MH**	Inorganic Silts (elastic)
	CLAYS	Clays of Low Plasticity (*LL < 50)		**CL**	Inorganic Clays (lean clays)
		Clays of High Plasticity (*LL > 50)		**CH**	Inorganic Clays (Fat clays)

* Liquid Limit of the soil

LICON ENGINEERING CO.

PROJECT MEMORANDUM

Date: December 14, 2007

To: Mr. Fred Dalbin, AIA
Wright & Dalbin Architects

From: Gerardo A. Licon, P.E. 12/17/07

Subject: Ysleta Annex Building Addition
Supplemental Foundation Recommendations
El Paso, Texas

Thank you for the opportunity to present this memorandum on the above referenced project. This memorandum includes supplemental recommendations to section 5.2 of our Geotechnical Engineering Study (File No. P07212) dated October 22, 2007.

Individual spread and/or continuous footings may be alternatively dimensioned using a net allowable bearing capacity of 2,200 pounds per square foot, with a minimum footing width of 24 inches. Footings should bear at a minimum depth of 12 inches below the lowest adjacent finished grade, on a minimum of 24 inches of compacted structural fill or compacted subgrade soils that meet the criteria for structural fill.

Structural fill material should be placed, moisture-conditioned and compacted in accordance with recommendations in section 5.6 of the geotechnical engineering report referenced above.

It was a pleasure to assist you on this subject. If you have any questions regarding the information we present herein, please call us.

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