BEATY PALMER ARCHITECTS
ADDENDUM

Date: 04.05.16
Project No. 1538
Page 1 of 1

ADDENDUM NO. 01

To the drawings and specifications for

DSD Staff parking Lot
1902 S. Alamo Street
San Antonio, TX 78204

San Antonio, Texas
Beaty Palmer Architects, Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205

This addendum is hereby made a part of the contract documents to the same extent as though it were originally included therein. This addendum shall take precedence over the original drawings and specifications where its provisions apply.

CONTRACTOR QUESTIONS

Item 1.1 Plan sheet A4 shows a detail LP1 –Light Pole Pier Footing, showing a depth of 10'-0"; detail 2/E2.1 indicates a depth of 6'-0". Which detail should we use?

For Light Pole Pier Footing detail, reference supplemental detail Sheet S1.1 from Beicker Consultants, LLC dated 03.11.16, attached to Sheet A4. Reference detail 2/E2.1 for electrical components to the Light Pole Footing Detail.

Item 1.2 Plan sheet C3 has two notes on top, indicating that there needs to be a retaining wall designed and possibly pedestrian barriers; this is also indicated in the legend. Plan sheet C5 also has a retaining wall in the legend. We could not find the locations of the retaining walls on the plans. Could you please indicate where the retaining walls go, if any, and also show a cross section for us to provide an accurate estimate?

There are no retaining walls in the scope of this project. The notes shown were general notes and have been removed. Refer to the revised Civil Sheets from Macina, Bose, Copeland and Associates, Inc. dated 04.05.16.

Item 1.3 Will there be a staging area other than the parking lot itself?

All staging, storage, parking, etc. shall be contained within the project limits.

Item 1.4 Plan sheet C6 indicates to install an aluminum pedestal and footing, a pedestrian signal head and pedestrian detector push button; we could not find a detail for these items nor technical specifications. Please indicate where to find the required details and technical specifications.

Refer to the attached detail Sheet C8 from Macina, Bose, Copeland and Associates, Inc. dated 04.05.16.

Item 1.5 Will there be any hazardous material on site to remove?

No.

Item 1.6 Will there be any restrictions on working hours?

No special restrictions. Refer to General, Supplementary, and Special Conditions.

GENERAL

Item 1.7 This parking area is for employee parking only. During peak hours the barrier gate arms will be open to allow free flow traffic. The parking area will have signage addressing staff only parking and will have security oversight.

Item 1.8 Construction personnel are to park all vehicles on site. Parking across the street at Development Services or on neighboring business properties is prohibited.

Item 1.9 Supplement the existing temporary construction fencing around the entire site perimeter as required.

Item 1.10 Allow the sum of $10,000 for the coordination with CPS to relocate/install the existing utility pole and transformer, conduits, etc. to provide power to the project / Refer to Specification Section 012100 Allowances.

Item 1.11 Revised 020 Bid Forms and 010 Formal Invitation for Bids forms have been revised and are located on the City's website / Ref. Attachments.

SPECIFICATIONS

Item 1.12 Add Architectural Specification Section 012100 Allowances.

Item 1.13 Add Architectural Specification Section 012300 Alternates.

Item 1.14 Add Electrical Specifications Section 260500 General Requirements for Electrical Work.

Item 1.15 Add Electrical Specifications Section 260519 Low-Voltage Electrical Power Conductors and Cables.

Item 1.16 Add Electrical Specifications Section 260526 Grounding and Bonding for Electrical Systems.

Item 1.17 Add Electrical Specifications Section 260534 Conduit.

Item 1.18 Add Electrical Specifications Section 260537 Boxes.

Item 1.19 Add Electrical Specifications Section 262416 Panelboards.

Item 1.20 Add Electrical Specifications Section 262726 Wiring Devices.

Item 1.21 Add Electrical Specifications Section 265600 Exterior Lighting.

Item 1.22 Add Geotechnical Study, from Fugro Consultants, Inc. dated 03.04.16, to the Project Specifications Manual / Ref. Attachments.

ARCHITECTURAL DRAWINGS

Item 1.23 Revise/Add dimensions to the ornamental fence details / Ref. Sheet A4 from Beaty Palmer Architects dated 04.05.16.

CIVIL DRAWINGS

Item 1.24 Refer to Attachments from Macina, Bose, Copeland and Associates, Inc. dated 04.05.16.

ELECTRICAL DRAWINGS
Item 1.25 Refer to Attachments from MS2 Consulting Engineers dated 04.05.16.

Attachments:

8.5"x11": Specification Sections 012100-Allowances and 012300-Alternates from Beaty Palmer Architects.

Narrative and Specification Sections-260500 General Requirements for Electrical Work; 260519-Low-Voltage Electrical Power Conductors and Cables; 260526-Grounding and Bonding for Electrical Systems; 260534-Conduit; 260537-Boxes; 262416-Panelboards; 262726-Wiring Devices; and 265600-Exterior Lighting from MS2 Consulting Engineers.

Geotechnical Study from Fugro Consultants, Inc.

020 Bid Form, 010 Formal Invitation for Bids, and Addendum Acknowledgement Form from City of San Antonio.

22"x34": Revised Sheet A4 from Beaty Palmer Architects.

Revised Sheets C1, C2, C3, C4, C5, C6, C7 and added Sheet C8 from Macina, Bose, Copeland and Associates, Inc.

Revised Sheet E2.1 from MS2 Consulting Engineers.

REGISTERED ARCHITECT
TERRY PALMER
16751
STATE OF TEXAS

4.5.16

Terry Palmer AIA
Beaty Palmer Architects, Inc.

MS2
CONSULTING ENGINEERS

ADDENDUM

4/5/2016

STATE OF TEXAS
RYAN A. ROYAL
94773
LICENSED
PROFESSIONAL ENGINEER

ADDENDUM: 1

DATE: April 5, 2016

PROJECT: DSD Staff Parking Lot

PROJECT NO.: 52580.00

SPECIFICATIONS

ELECTRICAL:

Item 1. Section 26 0500 – General Requirements for Electrical Work:
A) Include section in its entirety.

Item 2. Section 26 0519 – Low-Voltage Electrical Power Conductors and Cables:
A) Include section in its entirety.

Item 3. Section 26 0526 – Grounding and Bonding for Electrical Systems:
A) Include section in its entirety.

Item 4. Section 26 0534 – Conduit:
A) Include section in its entirety.

Item 5. Section 26 2416 – Panelboards:
A) Include section in its entirety.

Item 6. Section 26 2726 – Wiring Devices:
A) Include section in its entirety.

Item 7. Section 26 5600 – Exterior Lighting:
A) Include section in its entirety.

DRAWINGS

ELECTRICAL:

Item 1. Sheet E2.1 – Electrical One-Line Diagram / Schedules / Details:
A) Revise Pole Footing Detail to reference structural engineered detail for dimensions, rebar, and concrete type. Refer to revised Drawing.
B) Revise note on lighting controller to avoid conflict with General Electrical Note 3 on Sheet E1.1.

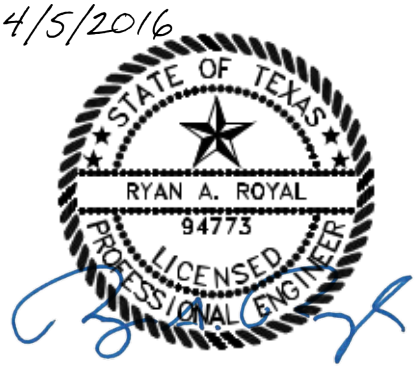
Attachment: Sheet E2.1, revised 4/5/2016

8200 IH-10 West, Suite 312, San Antonio, Texas 78230
Phone: 210 736-4265 Texas Firm Reg. No., F-465
www.ms2-inc.com

DIVISION 26 – ELECTRICAL

SECTION NUMBER	TITLE	PAGES
260500	General Requirements for Electrical Work	260500 -1 thru 6
260519	Low-Voltage Electrical Power Conductors and Cables	260519 -1 thru 7
260526	Grounding and Bonding for Electrical Systems	260526 -1 thru 4
260534	Conduit	260537 -1 thru 7
260537	Boxes	260535 -1 thru 4
262416	Panelboards	262416 -1 thru 6
262726	Wiring Devices	262726 -1 thru 3
265600	Exterior Lighting	265600 -1 thru 5

4/5/2016



SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Lump-sum allowances.

1.2 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.3 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.4 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include freight**,** and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.7 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Lump-Sum Allowance: Include the sum of $10,000.00: Include a lump sum allowance of $10,000.00 for the relocation and/or installation of the electrical power service including utility poles, transformers, conduits required to establish electrical service for the project .

1. This allowance includes coordination, demolition/removal, CPS fees, material cost, receiving, handling, and installation and Contractor overhead and profit.

END OF SECTION 012100

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Geogrid.

1. Base Bid: The Base Bid includes the pavement construction section for Automobile w/ Occasional Truck that general consist of 2 inches of Hot Mix Asphaltic Concrete over 8 inches of Item 200, Type A, Grade 1, Crush Limestone Base Material as described in the Geotechnical Study TO-106 Development Services Parking Lot by Fugro Consultants, Inc. and dated March 4, 2016. The Base Bid does not include a Geogrid to be included in the section.

2. Alternate: For Alternate No. 1, include the amount added to the Base Bid to add a Geogrid as a method to mitigate flexible pavement distress from shrink/swell movements. The Geogrid should consist of BX Type 1. The Geogrid should be placed between the compacted subgrade and the crushed limestone base material (CLBM). Install geogrid in accordance with the manufactures recommendations. The geogrid should have a minimum overlap of 2 feet or as recommended by the manufacturer, whichever is greater.

END OF SECTION 012300

SECTION 260500 - GENERAL REQUIREMENTS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The work covered by the Electrical Sections of the Specifications includes the furnishing of all materials, labor, transportation, tools, permits, fees, utilities, and incidentals necessary for the complete installation of all electrical work required in the Contract Drawings.

B. It is the intent of the Contract Documents to provide an installation complete in every respect.

C. The Contractor shall be responsible for the coordination and proper relation of his work to the building structure and to the work of all trades. The Contractor shall visit the premises and thoroughly familiarize himself with the existing site conditions, all details of the work and the working conditions, and verify all dimensions in the field. The Contractor shall advise the Architect of any discrepancy prior to bidding. The submission of bids shall be deemed evidence of the Contractor's site visit, the coordination of all existing conditions, and the inclusion of all consideration of existing conditions.

1.2 DRAWINGS AND SPECIFICATIONS

A. The Specifications are accompanied by Drawings that indicate the locations of equipment and materials of construction. The Drawings and Specifications are complementary, and what is required by one is as binding as if required by both.

B. Should the Drawings or Specifications be in conflict, the better quality or greater quantity of work or materials shall be provided.

C. Items specifically mentioned in the Specifications but not shown on the Drawings or items shown on the Drawings but not specifically mentioned in the Specifications shall be provided as if they were both specified and shown in the Drawings.

D. Division 26 Specifications are written in imperative and streamlined format. This imperative language is directed to the Contractor. The words "shall be" shall be included by inference where a colon (:) is used within sentences and phrases.

E. Where utilized in these Specifications, the following definitions apply:
   1. Install: To set in place in position for service.
   2. Furnish: To supply.
   3. Provide: To furnish, and set in place for service

1.3 CODES AND STANDARDS

A. Work shall comply with the local city codes and ordinances, the regulations of state authorities having lawful jurisdiction and the codes, statutes and reference standards

identified within these Specifications. These Specifications shall not be construed as negating the regulations or requirements of lawful jurisdictions.

B. Where Specifications require materials or equipment exceeding the minimum requirements of applicable codes and ordinances, the requirements of these Specifications shall take precedence.

1.4 UTILITIES

A. The Contract Documents reflect the general location and routing of utilities required for this project. Visit the site, and coordinate and confirm the exact requirements with the serving utilities, including electric, telephone, cable and other as included in the Contract. Refer to Division 1.

1.5 RECORD DOCUMENTS

A. Prepare and deliver to the Architect, record documents in accordance with the requirements in Division 1. Drawings shall clearly indicate the following installed conditions:
   1. Raceway system; size and location, of service entrance and feeder conductors, exterior and interior.
   2. Identify and indicate the installed locations of distribution and control equipment.
   3. Identify the branch circuit serving each outlet and each unit of utilization equipment and appliance.
   4. One line diagrams, illustrating the installed configuration of the power distribution system and each supervisory and control system provided under this Division.
   5. Locations and invert elevations of underground installations.
   6. Identify modifications of the original Construction Documents implemented by value engineering, change order, supplemental instruction or other authorized directive.

1.6 BUILDING CONSTRUCTION AND LAYOUT OF WORK

A. General: It shall be the responsibility of the Contractor to consult the Architectural and Engineering Drawings and Details so as to thoroughly familiarize himself with the type and quality of construction to be provided on this project.

B. The Electrical Drawings are diagrammatic in nature and do not show every connection in detail or every line or conduit in its exact location.
   1. These details are subject to the requirements of all codes and ordinances as well as all structural and architectural conditions. The Contractor shall carefully investigate structural and finish conditions and shall coordinate the separate trades in order to avoid interference between the various phases of work.

C. The approximate location of electrical items is indicated on the Electrical Drawings. Exact locations are to be determined by actual field measurements and will in all cases be subject to the approval of the Architect/Engineer. The Architect/Engineer reserves the right to make any reasonable changes in the indicated locations prior to installation at no additional cost.

PART 2 - PRODUCTS

2.1 GENERAL MATERIALS AND EQUIPMENT REQUIREMENTS

A. Materials and equipment shall conform to National Electrical Code requirements and shall be listed by Underwriters Laboratories, Inc. (UL). UL listing will be accepted as evidence that the material or equipment conform to the standards of that agency. In lieu of this listing, submit a statement from a nationally recognized testing agency, indicating that products have been tested in accordance with UL criteria and that the materials and equipment comply with Contract requirements.

2.2 STANDARD PRODUCTS

A. Materials and equipment: Standard catalog products of manufacturers regularly engaged in the manufacture of products conforming to these Specifications, and essential duplicates of materials and equipment that have been in satisfactory use at least two years prior to the date of receipt of bids. Custom fabricated items shall be fully described using Drawings and technical data sufficient to demonstrate compliance with the Contract Documents.

2.3 MANUFACTURER'S INSTRUCTIONS

A. Install materials and equipment in accordance with these Specifications and the manufacturer's recommendations and instructions.
   1. Request advice and supervisory assistance from equipment manufacturers as required to ensure proper installation, operation, and start-up of equipment.

B. Notify the Architect in writing of conflicts between the Contract Documents and the manufacturer's recommendations prior to proceeding with the work.

2.4 RUST PREVENTION

A. Protect ferrous metallic materials against corrosion. Provide ferrous metallic equipment and component parts with factory applied rust inhibiting treatment and painted, hot dip galvanized, electro-galvanized or equivalent rust inhibiting finish. Reference individual Division 26 sections for specific requirements pertaining to equipment and materials specified herein.

2.5 STORAGE AT SITE

A. Do not receive material or equipment at the site until ready for installation or unit suitable space is provided to properly protect equipment from the elements and physical damage.

2.6 CONDITION OF MATERIALS AND APPURTENANCES

A. Materials shall be new and unused. Material and equipment damaged in transit, during delivery to premises, while in storage, while being erected and installed, or while being tested, prior to final acceptance, shall be removed and acceptable material installed in place thereof.

PART 3 - EXECUTION

3.1 SPACE AND EQUIPMENT ARRANGEMENT

A. Install equipment and components in a manner to permit access to parts requiring service, and to permit removal for service without disassembly of adjacent equipment.

B. Completed installation shall provide minimum working clearances as required by NEC.

3.2 SUBMITTAL AND REVIEW OF MATERIALS

A. Submittal Time: Within the time period and in quantity specified in Division 1, submit Shop Drawings and technical data as required by the individual specification sections.

B. Submittals: Indicate on the front cover or the cover sheet of each binder the following: The title of the submittal; the name and location of the project; the names of the Architect and Engineer; Contractor's name; and the date of the submittal.
   1. Arrangement of Items: Subdivide items according to specification sections, with each section clearly divided to denote the section and referencing the appropriate paragraphs of the Specifications. Index as follows:
      a. General Index: Located behind the title sheet indexing the entire submittal by section (divider).
      b. Section Index: Located at each section divider, identifying included item.
   2. Manufacturer's Data: Descriptive literature, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts. Manufacturer's name, trade name, catalog or model, nameplate data, physical dimensions, specification references, applicable industry, and other information necessary to establish Contract compliance.
   3. Shop Drawings: Shop Drawings indicating types, sizes, accessories, elevations, floor plans, sectional views, installation details, elementary diagrams, and wiring diagrams as necessary to demonstrate compliance. Wiring diagrams shall identify circuit terminals and the internal wiring for each item of equipment and the interconnection between the items. Drawings shall also indicate adequate NEC working clearance and access to the working space.

C. Compliance Statement: Include with each submittal, a signed compliance statement as required by Division 1. certifying that each item submitted complies with the Specifications, and is physically compatible with the appropriate to the installed location. Unless so certified, documents will be returned without review. Certification shall be in the following format.

I herby certify that the attached submittal has been checked prior to submission and that it complies in all respects (except as noted*) with the requirements of the Contract Documents.
(Name of Contractor) _____
Signed: _____
Date: _____
* Refer to exception requirements herein.

D. Substitutions: Refer to Division 1.

E. Submittal Processing Time: In accordance with Division 1.
1. Allow three (3) weeks for submittal processing exclusive of transmittal time.
2. Submittal(s) marked resubmit or with comments requiring resubmittal shall be resubmitted within two (2) weeks following receipt. If an acceptable material is not submitted within the two-week period, the Architect reserves the right to require that specified material be provided.

F. Submittal Review:
1. Review and comment is performed for general compliance with the intent of the Contract Documents. Review and comments do not relieve the Contractor of the responsibility of compliance with the requirements of the Contract Documents.
2. The omission of any specified or reasonably implied characteristic, function, capacity, or component, on any item submitted, is inferred to indicate, by virtue of the Contractor's compliance statement, that the item complies with the intent of the Contract Documents.
3. The Architect/Engineer reserves the right to require submittal information, including samples, as considered necessary to accomplish review.
4. The Architect/Engineer reserves the right to reject any item or material, because of deceptive submittal material, and to require that any item found by field observation to be deficient in the represented characteristics, capacity and function, be removed from the site and that specified items be provided.

G. Owner's Records: Submit for the Owners records two (2) sets of complete "Final Review" submittals prior to final project acceptance.

3.3 OPERATING AND MAINTENANCE MANUAL

A. Furnish two (2) copies of bound, indexed operating and maintenance manuals with complete technical data for each electrical system. Deliver to the Architect prior to the time that system and equipment acceptance tests are performed. Include the following information:
1. Manufacturer's installation instructions.
2. Manufacturer's local representative and/or distributor's name and address.
3. Manufacturer's operating and maintenance instructions.
4. Manufacturer's internal wiring diagrams.
5. Contractor's installation wiring diagrams.
6. Control system installation wiring diagrams.
7. Control system installation Drawings.
8. Replacement part number listings and descriptions.

9. Warranties and guarantees.

3.4 TESTS

A. Perform system testing, verification and demonstration and provide Owner instruction in maintenance and operation as specified within each individual Specification section.

3.5 CONDITIONS OF EQUIPMENT AT FINAL ACCEPTANCE

A. Lighting fixtures and controls are operating as intended, and lenses and reflectors are free of dust, debris, and fingerprints.

B. Conductors within panelboards and control panels are neatly formed, bundled, and made-up tight. Equipment enclosure interiors are vacuum cleaned and exterior surfaces cleaned free of stray paint, dust, grease, and fingerprints. Circuit directories are neatly typed and in place.

C. Touch-up scratched surfaces using paint matching the factory applied finish. Where paint cannot be matched, the entire surface shall be repainted in a color and manner approved by the Architect.

3.6 GUARANTEE

A. Guarantee materials and workmanship for a period of not less than twelve (12) months or as otherwise required by Division 1 or individual specification sections after the final acceptance of work.

END OF SECTION

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Single conductor building wire.

B. Wiring connectors.

C. Electrical tape.

D. Heat shrink tubing.

E. Wire pulling lubricant.

1.2 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013.

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011.

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010 (Reapproved 2014).

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2014).

E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2010.

F. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

G. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; National Electrical Manufacturers Association; 2009 (ANSI/NEMA WC 70/ICEA S-95-658).

H. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

J. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

K. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

L. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

M. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.

N. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

1.3 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.1 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

2.2 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B 787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.

H. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.
      a. Exceptions:

1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.

2. Control Circuits: 14 AWG.

I. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

J. Conductor Color Coding:
1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
2. Color Coding Method: Integrally colored insulation.
a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
3. Color Code:
a. 240/120 V, 1 Phase, 3 Wire System:
1) Phase A: Black.
2) Phase B: Red.
3) Neutral/Grounded: White.
b. Equipment Ground, All Systems: Green.
c. For control circuits, comply with manufacturer's recommended color code.

2.3 SINGLE CONDUCTOR BUILDING WIRE

A. Manufacturers:
1. Copper Building Wire:
a. Cerro Wire LLC: www.cerrowire.com.
b. Encore Wire Corporation: www.encorewire.com.
c. Southwire Company: www.southwire.com.

B. Description: Single conductor insulated wire.

C. Conductor Stranding:
1. Feeders and Branch Circuits: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation:
1. Copper Building Wire: Type THHN/THWN-2 or XHHW-2, except as indicated below.
a. Installed Underground: Type XHHW-2 or THHN/THWN-2.
b. Damp and Wet Locations: XHHW-2 or THHN/THWN-2.
c. Feeders: XHHW-2 or THHN/THWN-2.
d. Service Entrance Below Grade: XHHW-2.

2.4 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Wiring Connectors for Splices and Taps:
   1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
   2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.

C. Wiring Connectors for Terminations:
   1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
   2. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
   3. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
   4. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.

D. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.

E. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.

F. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
   1. Manufacturers:
      a. 3M: www.3m.com.
      b. Ideal Industries, Inc: www.idealindustries.com.
      c. NSI Industries LLC: www.nsiindustries.com.

G. Mechanical Connectors: Provide bolted type or set-screw type.
   1. Manufacturers:
      a. Burndy: www.burndy.com.
      b. Ilsco: www.ilsco.com.
      c. Thomas & Betts Corporation: www.tnb.com.

H. Compression Connectors: Provide circumferential type or hex type crimp configuration.
   1. Manufacturers:
      a. Burndy: www.burndy.com.
      b. Ilsco: www.ilsco.com.
      c. Thomas & Betts Corporation: www.tnb.com.

2.5 WIRING ACCESSORIES

A. Electrical Tape:
   1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant

to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.

2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
3. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.

B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.

C. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that work likely to damage wire and cable has been completed.

B. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.3 INSTALLATION

A. Circuiting Requirements:
1. Unless dimensioned, circuit routing indicated is diagrammatic.
2. When circuit destination is indicated and routing is not shown, determine exact routing required.
3. Arrange circuiting to minimize splices.
4. Include circuit lengths required to install connected devices within 10 ft of location shown.
5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
6. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are shown as separate, combining them together in a single raceway is permitted, under the following conditions:
   a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
   b. Increase size of conductors as required to account for ampacity derating.
   c. Size raceways, boxes, etc. to accommodate conductors.

7. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer's instructions.

C. Install conductors and cable in a neat and workmanlike manner in accordance with NECA 1.

D. Installation in Raceway:
1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
2. Pull all conductors and cables together into raceway at same time.
3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

E. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

F. Install conductors with a minimum of 12 inches of slack at each outlet.

G. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet of slack.

H. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

I. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

J. Make wiring connections using specified wiring connectors.
1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
3. Do not remove conductor strands to facilitate insertion into connector.
4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

K. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
   1. Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
      a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
      b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.
   2. Wet Locations: Use heat shrink tubing.

L. Insulate ends of spare conductors using vinyl insulating electrical tape.

M. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.

N. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

END OF SECTION

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Connectors for grounding and bonding.

D. Ground rod electrodes.

E. Ground access wells.

1.2 RELATED REQUIREMENTS

A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.

B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

C. Section 265600 - Exterior Lighting: Additional grounding and bonding requirements for pole-mounted luminaires.

1.3 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

B. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; National Electrical Manufacturers Association; 2007.

C. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; International Electrical Testing Association; 2013 (ANSI/NETA ATS).

D. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.

PART 2 PRODUCTS

2.1 GROUNDING AND BONDING REQUIREMENTS

A. Do not use products for applications other than as permitted by NFPA 70 and product listing.

B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

D. Grounding Electrode System:
   1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
      a. Provide continuous grounding electrode conductors without splice or joint.
      b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
   2. Ground Rod Electrode(s):
      a. Provide two electrodes unless otherwise indicated or required.
      b. Space electrodes not less than 10 feet from each other and any other ground electrode.
      c. Provide ground access well for each electrode.

E. Bonding and Equipment Grounding:
   1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
   2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
   3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
   4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
   5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
   6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

F. Pole-Mounted Luminaires: Also comply with Section 265600.

2.2 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
   1. Provide products listed, classified, and labeled as suitable for the purpose intended.
   2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 260526:
   1. Use insulated copper conductors unless otherwise indicated.
      a. Exceptions:
         1) Use bare copper conductors where installed underground in direct contact with earth.
         2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
   1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
   2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
   3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

D. Ground Rod Electrodes:
   1. Comply with NEMA GR 1.
   2. Material: Copper-bonded (copper-clad) steel.
   3. Size: 3/4 inch diameter by 10 feet length, unless otherwise indicated.

E. Ground Access Wells:
   1. Description: Open bottom round or rectangular well with access cover for testing and inspection; suitable for the expected load at the installed location.
   2. Size: As required to provide adequate access for testing and inspection, but not less than minimum size requirements specified.
   3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 10 inches.
   4. Cover: Factory-identified by permanent means with word "GROUND".

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.

B. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install grounding and bonding system components in a neat and workmanlike manner in accordance with NECA 1.

C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.

D. Make grounding and bonding connections using specified connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
   2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
   3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
   4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
   5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

E. Identify grounding and bonding system components in accordance with Section 260553.

3.3 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.13.

D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.

E. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION

SECTION 260534 - CONDUIT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Intermediate metal conduit (IMC).

C. PVC-coated galvanized steel rigid metal conduit (RMC).

D. Liquidtight flexible metal conduit (LFMC).

E. Rigid polyvinyl chloride (PVC) conduit.

F. Conduit fittings.

G. Accessories.

1.2 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.

B. Section 260529 - Hangers and Supports for Electrical Systems.

1.3 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2005.

B. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit (EIMC); 2005.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); National Electrical Contractors Association; 2013.

E. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); National Electrical Contractors Association; 2003.

F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; National Electrical Manufacturers Association; 2012 (ANSI/NEMA FB 1).

G. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit; National Electrical Manufacturers Association; 2005.

H. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; National Electrical Manufacturers Association; 2013.

I. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; National Electrical Manufacturers Association; 2015.

J. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

L. UL 360 - Liquid-Tight Flexible Steel Conduit; Current Edition, Including All Revisions.

M. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

N. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

O. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.

PART 2 PRODUCTS

2.1 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.

C. Underground:
   1. Exterior, Direct-Buried: Use galvanized steel rigid metal conduit, intermediate metallic conduit (IMC), PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.
   2. Exterior, Embedded Within Concrete: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.
   3. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.
   4. Where rigid polyvinyl (PVC) conduit larger than 1 inch trade size is provided, use galvanized steel rigid metal conduit elbows for bends.
   5. Where steel conduit is installed in direct contact with earth where soil has a resistivity of less than 2000 ohm-centimeters or is characterized as severely corrosive based on soils report or local experience, use corrosion protection tape

to provide supplementary corrosion protection or use PVC-coated galvanized steel rigid metal conduit.

6. Where steel conduit emerges from concrete into soil, use corrosion protection tape to provide supplementary corrosion protection for a minimum of 4 inches on either side of where conduit emerges or use PVC-coated galvanized steel rigid metal conduit.

D. Exposed, Exterior: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or PVC-coated galvanized steel rigid metal conduit.

E. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

F. Connections to Vibrating Equipment:
1. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.

2.2 CONDUIT REQUIREMENTS

A. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Minimum Conduit Size, Unless Otherwise Indicated:
1. Branch Circuits: 3/4 inch (21 mm) trade size.
2. Control Circuits: 1/2 inch (16 mm) trade size.
3. Flexible Connections to Luminaires: 1/2 inch (16 mm) trade size.
4. Underground, Exterior: 1 inch (27 mm) trade size.

D. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.3 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:
1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.
   a. Do not use die cast zinc fittings.
3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.4 INTERMEDIATE METAL CONDUIT (IMC)

A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
      a. Do not use die cast zinc fittings.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.5 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.

B. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil.

C. PVC-Coated Fittings:
   1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
   2. Non-Hazardous Locations: Use fittings listed and labeled as complying with UL 514B.
   3. Material: Use steel or malleable iron.
   4. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil.

D. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil.

2.6 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
      a. Do not use die cast zinc fittings.

2.7 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

B. Fittings:
   1. Manufacturer: Same as manufacturer of conduit to be connected.
   2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.8 ACCESSORIES

A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil.

B. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.

C. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.

D. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as shown on drawings.

B. Verify that mounting surfaces are ready to receive conduits.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install conduit in a neat and workmanlike manner in accordance with NECA 1.

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Install intermediate metal conduit (IMC) in accordance with NECA 101.

E. Install PVC-coated galvanized steel rigid metal conduit (RMC) using only tools approved by the manufacturer.

F. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.

G. Conduit Routing:
   1. Unless dimensioned, conduit routing indicated is diagrammatic.
   2. When conduit destination is indicated and routing is not shown, determine exact routing required.
   3. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.

H. Conduit Support:

1. Secure and support conduits in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
2. Use conduit strap to support single surface-mounted conduit.
   a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
3. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
4. Use of wire for support of conduits is not permitted.

I. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
7. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

J. Provide grounding and bonding in accordance with Section 260526.

3.3 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

C. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or abrasions, repair in accordance with manufacturer's instructions.

D. Correct deficiencies and replace damaged or defective conduits.

3.4 CLEANING

A. Clean interior of conduits to remove moisture and foreign matter.

3.5 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

SECTION 260537 - BOXES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.

B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

C. Underground boxes/enclosures.

1.2 RELATED REQUIREMENTS

A. Section 260529 - Hangers and Supports for Electrical Systems.

1.3 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; National Electrical Contractors Association; 2010.

C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; National Electrical Manufacturers Association; 2012 (ANSI/NEMA FB 1).

D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2014.

E. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. SCTE 77 - Specification for Underground Enclosure Integrity; Society of Cable Telecommunications Engineers; 2013 (ANSI/SCTE 77).

G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

I. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.

J. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, boxes for hazardous (classified) locations, floor boxes, and underground boxes/enclosures.

PART 2 PRODUCTS

2.1 BOXES

A. General Requirements:
   1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
   2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
   3. Provide products listed, classified, and labeled as suitable for the purpose intended.
   4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
   5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
   1. Use cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
   2. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
   1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
   2. NEMA 250 Environment Type, Unless Otherwise Indicated:
   3. Junction and Pull Boxes Larger Than 100 cubic inches:
      a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

D. Underground Boxes/Enclosures:
   1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.
   2. Size: As indicated on drawings.
   3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches.
   4. Applications:

a. Sidewalks and Landscaped Areas Subject Only to Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77, Tier 8 load rating.
b. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.

5. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.
   a. Combination fiberglass/polymer concrete boxes/enclosures are acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as shown on drawings.

B. Verify that mounting surfaces are ready to receive boxes.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Box Supports:
   1. Secure and support boxes in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.

E. Install boxes plumb and level.

F. Install boxes as required to preserve insulation integrity.

G. Underground Boxes/Enclosures:
   1. Install enclosure on gravel base, minimum 6 inches deep.
   2. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.

H. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

I. Close unused box openings.

J. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

K. Provide grounding and bonding in accordance with Section 260526.

END OF SECTION

SECTION 262416 - PANELBOARDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Lighting and appliance panelboards.

B. Overcurrent protective devices for panelboards.

1.2 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.

B. Section 260529 - Hangers and Supports for Electrical Systems.

1.3 REFERENCE STANDARDS

A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; Federal Specification; Revision E, 2013.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

C. NECA 407 - Standard for Installing and Maintaining Panelboards; National Electrical Contractors Association; 2009.

D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

E. NEMA PB 1 - Panelboards; National Electrical Manufacturers Association; 2011.

F. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less; National Electrical Manufacturers Association; 2013 (ANSI/NEMA PB 1.1).

G. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; International Electrical Testing Association; 2013 (ANSI/NETA ATS).

H. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

K. UL 67 - Panelboards; Current Edition, Including All Revisions.

L. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.

M. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.

N. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for panelboards, enclosures, overcurrent protective devices, and other installed components and accessories.
   1. Include characteristic trip curves for each type and rating of overcurrent protective device upon request.

C. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, overcurrent protective device arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.

B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Eaton Corporation: www.eaton.com.

B. General Electric Company: www.geindustrial.com.

C. Schneider Electric; Square D Products: www.schneider-electric.us.

D. Siemens Industry, Inc: www.usa.siemens.com.

2.2 PANELBOARDS - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet.
   2. Ambient Temperature:
      a. Panelboards Containing Circuit Breakers: Between 23 degrees F and 104 degrees F.

C. Short Circuit Current Rating:
   1. Provide panelboards with listed short circuit current rating as indicated on the drawings.
   2. Listed series ratings are not acceptable.

D. Panelboards Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.

E. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.

F. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.

G. Bussing: Sized in accordance with UL 67 temperature rise requirements.
   1. Provide fully rated neutral bus unless otherwise indicated, with a suitable lug for each feeder or branch circuit requiring a neutral connection.
   2. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
   3. Provide separate isolated/insulated ground bus where indicated.

H. Conductor Terminations: Suitable for use with the conductors to be installed.

I. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA 250: As indicated on the drawings.
   2. Boxes: Galvanized steel unless otherwise indicated.
   3. Fronts:
      a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
      b. Finish for Painted Steel Fronts: Manufacturer's standard grey unless otherwise indicated.
   4. Lockable Doors: All locks keyed alike unless otherwise indicated.

J. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

2.3 LIGHTING AND APPLIANCE PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, lighting and appliance branch circuit type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Conductor Terminations:
   1. Main and Neutral Lug Material: Copper, suitable for terminating copper conductors only.
   2. Main and Neutral Lug Type: Mechanical.

C. Bussing:
   1. Phase Bus Connections: Arranged for sequential phasing of overcurrent protective devices.
   2. Phase and Neutral Bus Material: Copper.
   3. Ground Bus Material: Copper.

D. Circuit Breakers: Thermal magnetic bolt-on type unless otherwise indicated.

E. Enclosures:
   1. Provide surface-mounted enclosures as indicated.
   2. Provide clear plastic circuit directory holder mounted on inside of door.

2.4 OVERCURRENT PROTECTIVE DEVICES

A. Molded Case Circuit Breakers:
   1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
   2. Interrupting Capacity:
      a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
         1) 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
      b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
   3. Conductor Terminations:
      a. Provide mechanical lugs unless otherwise indicated.
      b. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
   4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
   5. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.
   6. Provide the following circuit breaker types where indicated:
      a. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.
   7. Do not use tandem circuit breakers.

8. Provide the following features and accessories where indicated or where required to complete installation:

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as shown on the drawings.

B. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.

C. Verify that mounting surfaces are ready to receive panelboards.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install panelboards securely, in a neat and workmanlike manner in accordance with NECA 1 (general workmanship), NECA 407 (panelboards), and NEMA PB 1.1.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide required supports in accordance with Section 260529.

E. Install panelboards plumb.

F. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches above the floor or working platform.

G. Provide grounding and bonding in accordance with Section 260526.
   1. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on isolated/insulated ground bus.
   2. Terminate branch circuit isolated grounding conductors on isolated/insulated ground bus only. Do not terminate on solidly bonded equipment ground bus.

H. Install all field-installed branch devices, components, and accessories.

I. Provide filler plates to cover unused spaces in panelboards.

3.3 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Test GFCI circuit breakers to verify proper operation.

D. Correct deficiencies and replace damaged or defective panelboards or associated components.

3.4 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

B. Adjust alignment of panelboard fronts.

3.5 CLEANING

A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 262726 - WIRING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Receptacles.

B. Wall plates.

1.2 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; Federal Specification; Revision G, 2001.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

C. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2010).

D. NEMA WD 6 - Wiring Device -- Dimensional Specifications; National Electrical Manufacturers Association; 2012.

E. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

F. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

1.3 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Hubbell Incorporated: www.hubbell-wiring.com.

B. Leviton Manufacturing Company, Inc: www.leviton.com.

C. Lutron Electronics Company, Inc: www.lutron.com.

D. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us

2.2 WIRING DEVICE APPLICATIONS

A. Provide wiring devices suitable for intended use and with ratings adequate for load served.

B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.

C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.

2.3 RECEPTACLES

A. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
   1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
   2. NEMA configurations specified are according to NEMA WD 6.

B. GFCI Receptacles:
   1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
   2. Weather Resistant GFCI Receptacles: Commercial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.

2.4 WALL PLATES

A. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

B. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130.

B. Install wiring devices in accordance with manufacturer's instructions.

C. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.

D. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

E. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

F. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.

G. Install wiring devices plumb and level with mounting yoke held rigidly in place.

H. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

3.4 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect each wiring device for damage and defects.

C. Test each receptacle to verify operation and proper polarity.

D. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.

E. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.5 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION

SECTION 265600 - EXTERIOR LIGHTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Exterior luminaires.

B. Ballasts.

C. Lamps.

D. Poles and accessories.

1.2 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.

B. Section 260537 - Boxes.

C. Section 262813 - Fuses.

1.3 REFERENCE STANDARDS

A. AASHTO LTS - Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals; American Association of State Highway and Transportation Officials; 6th Edition, with 2015 Interim Revisions

B. ANSI C82.4 - American National Standard for Ballasts for High-Intensity-Discharge and Low Pressure Sodium Lamps (Multiple-Supply Type); 2002.

C. IEEE C2 - National Electrical Safety Code; Institute of Electrical and Electronic Engineers; 2012.

D. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products; Illuminating Engineering Society; 2008.

E. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules; Illuminating Engineering Society; 2015.

F. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

G. NECA/IESNA 501 - Recommended Practice for Installing Exterior Lighting Systems; National Electrical Contractors Association; 2006.

H. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 1029 - High-Intensity-Discharge Lamp Ballasts; Current Edition, Including All Revisions.

J. UL 1598 - Luminaires; Current Edition, Including All Revisions.

K. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
   1. LED Luminaires:
      a. Include estimated useful life, calculated based on IES LM-80 test data.
      b. Include IES LM-79 test report upon request.
   2. Lamps: Include rated life and initial and mean lumen output.
   3. Poles: Include information on maximum supported effective projected area (EPA) and weight for the design wind speed.

1.5 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for all LED luminaires, including drivers.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acuity Brands, Inc: www.acuitybrands.com.

B. Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com.

C. Hubbell Lighting, Inc: www.hubbelllighting.com.

2.2 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

2.3 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Provide luminaires listed and labeled as suitable for wet locations unless otherwise indicated.

H. LED Luminaires:
   1. Components: UL 8750 recognized or listed as applicable.
   2. Tested in accordance with IES LM-79 and IES LM-80.
   3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

I. Exposed Hardware: Stainless steel.

2.4 BALLASTS

A. Manufacturers:
   1. General Electric Company/GE Lighting: www.gelighting.com.
   2. Osram Sylvania: www.sylvania.com.
   3. Philips Lighting Electronics/Advance: www.advance.philips.com.

B. All Ballasts:
   1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
   2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.

C. High Intensity Discharge (HID) Ballasts: Unless otherwise indicated, provide electromagnetic ballasts complying with ANSI C82.4 and listed and labeled as complying with UL 1029.
   1. Input Voltage: Suitable for operation at voltage of connected source, with variation tolerance of plus or minus 5 percent.
   2. Power Factor: Not less than 0.90 unless otherwise indicated.

2.5 LAMPS

A. Manufacturers:
   1. General Electric Company/GE Lighting: www.gelighting.com.

2. Osram Sylvania: www.sylvania.com.
3. Philips Lighting Company: www.lighting.philips.com.

B. Lamps - General Requirements:
1. Unless explicitly excluded, provide new, compatible, operable lamps in each luminaire.
2. Verify compatibility of specified lamps with luminaires to be installed. Where lamps are not specified, provide lamps per luminaire manufacturer's recommendations.
3. Minimum Efficiency: Provide lamps complying with all current applicable federal and state lamp efficiency standards.
4. Color Temperature Consistency: Unless otherwise indicated, for each type of lamp furnish products which are consistent in perceived color temperature. Replace lamps that are determined by the Architect to be inconsistent in perceived color temperature.

2.6 POLES

A. All Poles:
1. Provide poles and associated support components suitable for the luminaire(s) and associated supports and accessories to be installed.
2. Structural Design Criteria:
   a. Comply with AASHTO LTS.
   b. Wind Load: Include effective projected area (EPA) of luminaire(s) and associated supports and accessories to be installed.
      1) Design Wind Speed: 90 miles per hour, with gust factor of 1.3.
   c. Dead Load: Include weight of proposed luminaire(s) and associated supports and accessories.
3. Material: Steel, unless otherwise indicated.
4. Shape: Square straight, unless otherwise indicated.
5. Finish: Match luminaire finish, unless otherwise indicated.
6. Mounting: Install on concrete foundation, height as indicated on the drawings, unless otherwise indicated.

B. Metal Poles: Provide ground lug, accessible from handhole or transformer base.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as shown on the drawings.

B. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 260537 as required for installation of luminaires provided under this section.

B. Install products according to manufacturer's instructions.

C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 1 (general workmanship) and NECA/IESNA 501 (exterior lighting).

D. Pole-Mounted Luminaires:
   1. Maintain the following minimum clearances:
      a. Comply with IEEE C2.
      b. Comply with utility company requirements.
   2. Grounding:
      a. Bond luminaires, metal accessories, metal poles, and foundation reinforcement to branch circuit equipment grounding conductor.
      b. Provide supplementary ground rod electrode as specified in Section 260526 at each pole bonded to grounding system as indicated.
   3. Install separate service conductors, 12 AWG copper, from each luminaire down to handhole for connection to branch circuit conductors.
   4. Install non-breakaway in-line fuse holders and fuses complying with Section 262813 in pole handhole for each ungrounded conductor.

E. Install accessories furnished with each luminaire.

F. Bond products and metal accessories to branch circuit equipment grounding conductor.

3.3 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.

B. Luminaires with Field-Rotatable Optics: Position optics according to manufacturer's instructions to achieve lighting distribution as indicated or as directed by Architect.

3.4 CLEANING

A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.5 PROTECTION

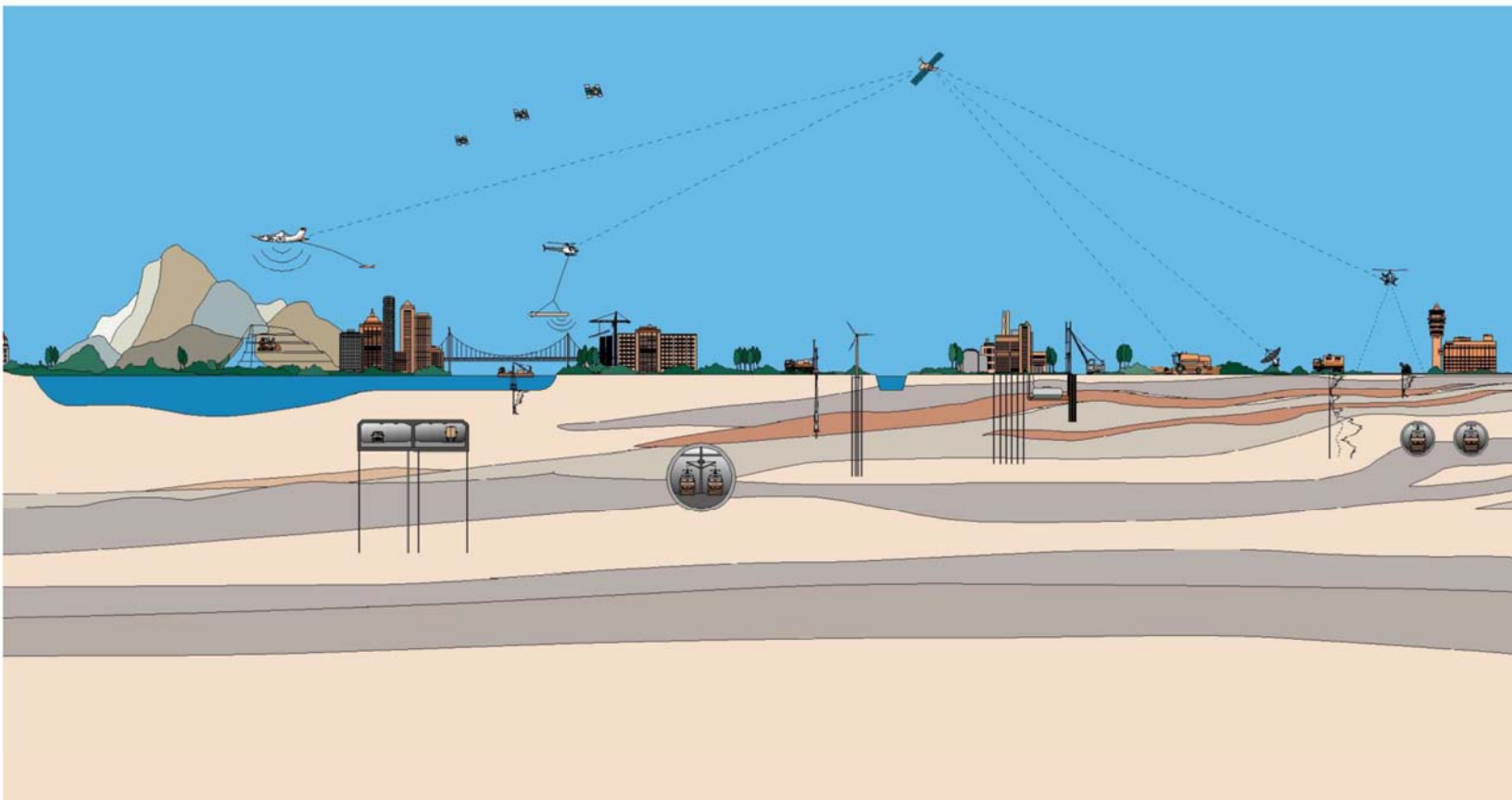
A. Protect installed luminaires from subsequent construction operations.

END OF SECTION

FUGRO CONSULTANTS, INC.

GEOTECHNICAL STUDY
TO-106 DEVELOPMENT SERVICES PARKING LOT
1920 S. ALAMO STREET
SAN ANTONIO, TEXAS

CITY OF SAN ANTONIO
TRANSPORTATION AND CAPITAL IMPROVEMENTS DEPARTMENT
SAN ANTONIO, TEXAS



FUGRO CONSULTANTS, INC.

Report No. 04.36161002
March 4, 2016

11009 Osgood
San Antonio, Texas 78233
Tel: 210-536-3300
Fax: 210-655-9519

CITY OF SAN ANTONIO
Transportation and Capital Improvements Department
San Antonio, Texas 78205

Attention: Mr. Dale V. Lange
City Architect's Office

Geotechnical Study
TO-106 Development Services Parking Lot
1920 S. Alamo Street
San Antonio, Texas

Submitted herewith is the report of the geotechnical study for the proposed Development Services Parking Lot at 1920 S. Alamo Street, San Antonio, Texas. In brief, the report includes a plan of borings, boring logs, laboratory test results and descriptions of subsurface conditions. Based on the findings, geotechnical recommendations are set forth for the design and construction of pavement and light poles foundations.

Fugro Consultants, Inc. appreciates the opportunity to provide these geotechnical engineering services to the City of San Antonio. We look forward to future assignments.

Sincerely,

FUGRO CONSULTANTS, INC.
TBPE Firm Registration No. 299

STATE OF TEXAS
JUNE M. POTTER
106243
LICENSED
PROFESSIONAL ENGINEER
3-4-2016

June M. Potter, P.E.
Project Manager

Jose J. Asyn, P.E.
Branch Manager

(Geotech\Geotech 2016\04.36161002\04.36161002 Development Services Parking Lot.doc)
Copies Submitted: 1 copy, pdf via email

GEOTECHNICAL STUDY

TO-106 DEVELOPEMENT SERVICES PARKING LOT
1920 S. ALAMO STREET
SAN ANTONIO, TEXAS

Report to:

CITY OF SAN ANTONIO
TRANSPORTATION AND CAPITAL IMPROVEMENTS DEPARTMENT
San Antonio, Texas

Submitted By:

FUGRO CONSULTANTS, INC
March 2016

CONTENTS

PAGE

INTRODUCTION 1

AUTHORIZATION 1

PURPOSE AND SCOPE 1

FIELD INVESTIGATION 2

LABORATORY TESTING 2

SITE AND SUBSURFACE CONDITIONS 3
- Site Physiography 3
- Geology 3
- Strata Descriptions 3
- Site Stratigraphy and Engineering Properties 3
- Groundwater 4

ESTIMATED POTENTIAL VERTICAL MOVEMENTS 4

LIGHT POLE PARKING LOT STRUCTURES 4
- Drilled Shaft Axial Design 5
- Soil Parameters for Lateral Load Analyses of Drilled Shafts 5
- Drilled Shaft Construction 6

PAVEMENT RECOMMENDATIONS 7

SHRINK / SWELL MITIGATION AND ALTERNATIVES 8

GROUNDWATER CONTROL 9

CONDITIONS 9

ILLUSTRATIONS

PLATE

VICINITY MAP 1

PLAN OF BORINGS 2

BORING LOGS ..... 3 thru 6

KEY TO TERMS AND SYMBOLS USED ON THE BORING LOGS 7

ULTIMATE AXIAL CAPACITY – UNIT DIAMETER DRILLED SHAFTS 8

INTRODUCTION

The City of San Antonio (CoSA) with the assistance of Beaty Palmer Architects is redeveloping a city lot for the use as a parking lot. The Development Services Parking Lot at 1920 S. Alamo Street, is located on the southwest corner of S. Alamo Street and S. Flores Street, as shown on the Vicinity Map, Plate 1. The proposed project consists of a new parking lot with a total of about 94 parking spaces and several light poles. Each light pole will be about 30 feet in height and placed on 24-inch diameter pedestal that is 40 inches in height, each light pole foundation is expected to carry a moment of about 99 kip-inches.

Fugro understands that the previous structures on site were recently demolished. Furthermore, we have assumed that no grade changes or below grade structures are planned for the project.

AUTHORIZATION

This study was performed in general accordance with the scope of work outlined in our proposal (Fugro's Proposal No. 04.36161002), dated January 26, 2016. Our services performed in accordance with the 2011 On Call Geotechnical and Construction and Materials Testing Services Contract between CoSA and Fugro dated August 8, 2011. Authorized to proceed was provided with Task Order 106.

PURPOSE AND SCOPE

The purposes of the study were to 1) obtain subsurface information to identify geotechnical and geologic conditions at the boring locations, 2) provide geotechnical recommendations for design and construction of the proposed parking lot, and 3) provide earthwork recommendations to reduce potential vertical movements to less than an inch in the parking areas, and 4) provide axial and lateral capacities for recommended drilled shafts.

These purposes were accomplished through a three phase study including 1) a field investigation for determining subsurface conditions at the boring locations and obtaining representative samples for classification and testing, 2) a laboratory testing program to aid in soil classification and to establish engineering properties of the strata encountered, and 3) analyses of field and laboratory data to develop geotechnical design and construction recommendations.

Field sampling, laboratory testing, and soil classifications and descriptions were in general accordance with methods, procedures, and practices set forth by the American Society for Testing and Materials, Annual Book of ASTM Standards, where applicable.

FIELD INVESTIGATION

The field investigation consisted of 4 borings (designated as B-1 through B-4) that were drilled to depths of 10 ft to 35 ft below existing grade. The approximate locations of the borings drilled are shown on the Plan of Borings, Plate 2. A summary table of the boring designations and boring depths is presented below.

Boring Designation	Boring Depth (feet)
B-1	35
B-2	15
B-3	10
B-4	10

The borings were drilled with a truck-mounted drill rig equipped with 1) continuous flight augers for advancing the holes dry and recovering disturbed samples (ASTM D 1452), 2) seamless push tubes for obtaining relatively undisturbed soil samples of cohesive strata (ASTM D 1587), and 3) split-barrel samplers and drive weight assembly for obtaining representative samples and measuring the penetration resistance (N values) of non-cohesive soil strata (ASTM D 1586). At the completion of the field exploration, the boreholes were backfilled with soil cuttings and granular bentonite.

Detailed descriptions of subsurface materials encountered at the boring locations are presented on the Logs of Borings, Plates 3 through 6. Keys to Terms and Symbols used on the logs are included on Plate 7. Pocket penetrometer values in tons per square foot (tsf) and Standard Penetration Test (SPT) N-values in blows per foot (bpf) are presented on the logs of borings at the respective test depth. Groundwater observations made during drilling are presented on the boring logs and summarized in the groundwater section of this report.

LABORATORY TESTING

The laboratory testing program included identification and classification testing of the strata encountered in the subsurface. Soil classification tests, including Atterberg limit determinations (ASTM D 4318) and partial grain-size analyses (ASTM D 422), were conducted on representative samples of the soil strata. The undrained shear strength of selected samples was measured by performing unconsolidated-undrained (UU) triaxial compression tests (ASTM D 2850). The classification and compressive strength tests included water content determinations (ASTM D 2216). The compression tests also including unit dry weight determinations. The results of the tests are tabulated on the boring logs at sample recovery depths.

Two samples were tested for soluble sulfate (ASTM D 516) in case lime is used to stabilize some of the on-site soils. The results of the soluble sulfate tests are summarized in the following table.

Boring Number	Sample Depth (feet)	Soluble Sulfate Content (ppm)
B-1	6 – 8	300
B-3	4 – 6	273

SITE AND SUBSURFACE CONDITIONS

Site Physiography

The study area is located on the southwest corner of S. Alamo Street and S. Flores Street, and is currently vacant after existing structures were recently demolished. Specific ground surface elevations (topography) of the study areas have not been provided. However, based on ground surface elevations obtained from Google Earth the site slopes to the north-east at a slope of about 1 percent.

Geology

A review of available geologic information indicates that the project site is located on clays and sands of the Pleistocene-age Fluviatile Terrace Deposits (Qt). The Fluviatile Terrace Deposits generally consist of gravel, sand, silt and clay; composed of materials similar to those present in contiguous alluvium.

Strata Descriptions

Descriptions of strata made in the field at the time the borings were drilled were modified in accordance with results of laboratory tests and visual examination in the laboratory. Recovered soil samples were examined and classified in general accordance with ASTM D 2487 and described as recommended in ASTM D 2488. Classifications of the soils and finalized descriptions of soil strata are shown on the logs of borings.

Site Stratigraphy and Engineering Properties

Subsurface conditions can best be understood by a thorough review of the boring logs presented on Plates 3 through 6. Brief descriptions of the subsurface conditions encountered are provided below for the study area parking lot.

The borings encountered an approximate 1 ft to 5 ft (average 3.3 ft) layer of tan and dark brown fill. The fill layer was composed of clayey sands and clayey gravels. Measured plasticity indices range from 8 to 13 (average 11), and percentages of materials passing the No. 200 sieve vary from 25 to 27 (average 26). The fill layer is underlain by a dark brown fat clay (CH) layer to depths of about 6 to 10 feet. Measured plasticity indices range from 48 to 54 (average 51), and percentages of materials passing the No. 200 sieve vary from 94 to 96 (average 95). At Boring B-1 sandy clay is observed from 6 ft to 10 ft. A tan, lean clay (CL) was typically encountered

below the fat clay layer soils and extended to a depth of 23-ft at Boring B-1 and completion depth of Borings B-2 through B-4. Measured plasticity indices range from 11 to 20 (average 16), and percentages of materials passing the No. 200 sieve averaged 67. At Boring B-1 the lean clay was sandy and at Boring B-2 gravelly. Below 23 ft at Boring B-1, tan soils composed of clayey sand (SC) were encountered to 28 ft. The clayey sand was underlain by tan fat gravelly clay (CH) from 28 ft to 32 ft and tan lean clay (CL) from 32 ft to 35 ft at completion.

Measured undrained shear strengths of the soils encountered at these boring locations (B-1 through B-4) varied from 1.0 to 2.3 ksf (average 1.6 ksf).

Groundwater

The borings were advanced without the use of drilling fluids. During the drilling operation groundwater was observed at location B-1 at a depth of 25 feet. After the boring completion, the water was observed at a depth of 18 feet.

ESTIMATED POTENTIAL VERTICAL MOVEMENTS

Estimates of vertical soil movements at the site were evaluated using the Texas Department of Transportation (TxDOT) Potential Vertical Rise (PVR) test method, TEX-124-E[1]. The potential vertical movement was calculated by examining each boring and using a zone of seasonal moisture change of 15 feet. The estimated value for PVR is 1½ to 2½ inches for dry soil conditions. However, the estimated value for PVR is less than 1 inch where fill material exceeds a depth of 5 feet. Past experience in central Texas indicates actual heave may be more than calculated by this method. The PVR procedure derives potential swell from a historic PI versus swell curve. Therefore, the estimated vertical movement values calculated using the PVR method might be different from actual measured movements that occur at the project site.

LIGHT POLE PARKING LOT STRUCTURES

The proposed parking lot will have a footprint of about 300-ft by 100-ft and encompass about 94 parking spots. Fugro understands each light pole will be about 30-ft tall and will be placed on top of a 24-inch diameter pedestal about 40 inches tall. Each light pole foundation is expected to carry a moment of about 99 kip-inches. The light pole foundations are expected to be supported on drilled shaft foundations. There are no grade changes expected for the project.

1 The State of Texas, Texas Department of Transportation, Materials and Test Division, Manual of Testing Procedures, Volume 1, Test Method TEX-124-E, Rev. January 1, 1978.

Drilled Shaft Axial Design

The ultimate axial capacity curve for unit diameter drilled shafts was computed using the FHWA Drilled Shaft and Design Construction Manual method (Reese and O'Neill, 1999)[2]. In this method, the ultimate compressive capacity for a given penetration is computed as the sum of the skin friction on the shaft wall and the end bearing on the shaft tip. In our analysis we have neglected the skin friction in the upper 5-ft of soil to account for soil disturbance associated with shaft installation and other construction related activities. We have also neglected end bearing capacity.

The ultimate axial shaft capacity curve is presented on Plate 8. The **ultimate** axial capacity curve of unit (1-foot) diameter drilled shafts, computed using the procedures presented in the *Drilled Shaft Construction Procedures and Design Methods Manual*[3], is presented on Plate 8. To obtain the ultimate axial capacity for a specific shaft size, multiply the capacity from Plate 8 by the actual shaft diameter in feet.

The penetration should be referenced from the natural ground surface at the time of our exploration, or final grade, whichever is lower. We recommend a factor of safety of 3.0 be applied to the ultimate axial capacity for shafts loaded in sustained and transient compression and tension.

A minimum center-to-center spacing between drilled shafts of at least three shaft diameters should be maintained. If the minimum spacing cannot be maintained, the geotechnical engineer should be retained to consider the group effect of the closely spaced shafts.

The structural capacities of the drilled shafts should be checked for allowable stresses in the concrete, total downward axial loads, tension forces, lateral forces, and moments produced by dead plus probable maximum live loads.

A minimum reinforcement steel area of 1.0 percent of the gross area of the shaft is recommended. The shaft reinforcement should extend from the top to the bottom of the shaft.

Soil Parameters for Lateral Load Analyses of Drilled Shafts

Straight-sided drilled shaft foundations will be subject to compression, tension, shear, and bending forces. Soil parameters are included herein for others to perform the lateral load analyses using the computer program LPILE^{plus} 5.0[4]. The program models the shaft behavior using a finite difference method and determines the non-linear response of the soil using various

2 Reese, L.C. and O'Neill, M.W. (1999), "Drilled Shafts: Construction Procedures and Design Methods", Federal Highway Administration, Publication No. FHWA-IF-99-025.

3 Reese, L. C. and O'Neill, M. W. (1988), "Drilled Shafts: Construction Procedures and Design Methods", Federal Highway Administration, Publication No. FHWA-HI-88-042.

4 "LPile Plus 5.0 for Windows", Ensoft, Inc., Austin, Texas.

soil resistance-pile deflection (p-y) criteria. The program accommodates the analysis of various shaft sizes subjected to axial load, lateral load, and bending moments. The recommended soil parameters are set forth in the following table. The structural engineer should select the required drilled shaft length, diameter, and percent of steel for the design loading conditions. The structural engineer should consider in the lateral load design that the parameters presented herein are ultimate values. Different units for the parameters herein may be required for input by the computer program, LPILE^{PLUS} 5.0.

Depth (ft)	Internal Soil Type (LPILE*)	Total Unit Weight (pcf)	Soil-Modulus, k (pci)	Internal Friction, (degrees)	Undrained Shear Strength (ksf)	Strain, ε_{50}
0 - 5	Stiff Clay Without Free Water	120	0	0	0	0
5 - 10	Stiff Clay Without Free Water	122.5	500	0	1.5	0.007
10 - 23	Stiff Clay Without Free Water	125	1000	0	2.0	0.005
23 - 28	Sand	120	60	30	0	0
28 - 35	Stiff Clay Without Free Water	130	1000	0	3.4	0.005

Note: Total Unit Weight should be adjusted for buoyant conditions.

Drilled Shaft Construction

1. Contract documents should provide for the use of temporary casing for proper installation of drilled shafts should detrimental groundwater and caving soil. It should be noted that groundwater was encountered at 1 of the borings at depths between 18 ft and 25 ft, and relatively clean sand layers were encountered at the 23 ft to 28 ft depth at Boring B-1.

2. To prevent deterioration of the sides and bottoms of shaft excavations, reinforcement and concrete should be placed the same day drilling operations are completed. Before placement, shafts should be inspected to ensure bottoms and sidewalls are free of deleterious spall and free water.

3. In order to promote shaft-to-soil bonding, drilled-shaft concrete should be specified as a high slump concrete (7-inch to 8-inch slump, preferably superplasticized), which still has the proper characteristics of normal concrete such as workability, durability, cohesiveness, and strength.

4. Centralizing chutes, tremies, and/or concrete pumps may be necessary to prevent the concrete from striking the sides of reinforcement and thus segregating. The desired maximum free fall of concrete should be about 10 ft, but greater heights are allowable if segregation can be eliminated and if the shaft hole is dry.
5. The drilled shaft operations should be inspected, on a full-time basis, by a qualified representative of the geotechnical engineer of record to a) verify desired penetration into the bearing stratum, b) verify shaft dimensions and proper reinforcement, c) monitor cleanness and amount of water in shaft excavations, d) monitor placement of concrete and use of tremie or pumps, e) monitor the extraction of casing, if used, and f) maintain accurate records.
6. As the design of any foundation relies heavily on generalizations drawn from subsurface conditions determined at a limited number of boring locations, verification of these generalizations at any given location should not be dictated by criteria based on depth or drilling resistance. Instead, the sides and bottoms of shafts should be evaluated by the geotechnical engineer of record to ensure that shaft bottom at the recommended depth. Even though the drilled shafts are not designed for end bearing, the bottom of the drilled shaft excavations should be cleaned as if the shafts were designed for end-bearing.
7. In addition to construction recommendations contained herein, the shafts should be constructed in general accordance with ACI 336.3R, Chapters 4 and 5.

PAVEMENT RECOMMENDATIONS

Recommendations are provided for flexible pavement using the AASHTO Guide for the Design of Pavement Structures (1993)[5] and traffic categories for parking lots, Baker (1975)[6], modified to fit anticipated traffic condition. Our analysis was conducted using the WinPAS 12 Pavement Analysis Software based on the values recommended by the City of San Antonio 2012 Design Guidance Manual, Appendix 10-A, "City of San Antonio Pavement Design Standards". We understand the pavement is being considered temporary. Based on this information the recommendations were formulated for various 18-kip equivalent single axle loadings (ESAL) over a 10-year design life. The traffic loadings should be evaluated by the traffic engineer to determine if these estimated ESAL values are appropriate for this project.

The Owner and Designer need to be aware that the flexible pavement sections presented herein will crack and become rough due to vertical movements associated with moisture changes in the underlying highly plastic clay soils. The pavement sections presented herein are not designed to resist potential vertical movements of the underlying highly plastic clay soils that have estimated

5 American Association of State Highway and Transportation Officials, AASHTO Guide for Design of Pavement Structures, 1993. Washington, D.C.

6 Baker, R.F., et al (1975), Handbook of Highway Engineering, New York, Van Nostrand Reinhold, Chapter 16.

potential vertical movements 1½ to 2½ inches. Including mitigation options, discussed later in this section, will extend the life and performance of the pavement.

Recommended thicknesses of crushed limestone base material (CLBM) and hot mix asphaltic concrete (HMAC) for the anticipated traffic categories and anticipated subgrade conditions are set forth in the following table.

Traffic Condition	Estimated 18-Kip ESALs	CLBM Thickness (inches)	HMAC Thickness (inches)
Automobile Only	2,500	6	2
Automobile w/Occasional Truck	5,000	8	2

The hot mix asphaltic concrete (HMAC) surface course should consist of Type C and the base course should consist Type B in accordance with Item 205 of the CoSA Standard Specifications for Construction. The crushed limestone base material (CLBM) should consist of Item 200, Type A, Grade 1 base.

PAVEMENT CONSTRUCTION

Construction of the parking lot should proceed in accordance with City of San Antonio 2012 Design Guidance Manuel, Appendix 10-A, "City of San Antonio Pavement Design Standards" and any supplemental construction recommendations presented herein.

- Scarify soils to a depth of at least 8 inches and recompacted to at least 95 percent of the maximum dry density determined using TxDOT Test Method TEX-114-E at a water content between 0 and 4 percent above the optimum moisture content.
- Proof roll the subgrade across the site in accordance with TxDOT Standard Specifications Item 216, Proof Rolling. The proof rolling operation should be observed by a representative of the geotechnical engineer.
- Weak or soft areas identified during proof rolling should be removed and replaced with suitable compacted select fill.

Construction operations should be monitored by a qualified engineer to ensure that the design requirements are met. Project specifications should dictate that the material thicknesses specified herein be a minimum thickness at any location rather than an average.

SHRINK / SWELL MITIGATION AND ALTERNATIVES

Shrink/swell potential of highly plastic clay soils can be reduced through a variety of measures, but cannot be eliminated without complete removal of the problematic soil. Several measures to help mitigate or reduce shrink/swell movements include:

- Chemical Injection of Soil,
- Soil Treatment with Lime or Cement,
- Geogrids,
- Removal and Replacement of the High PI Soils, and
- Drains or Barriers to Collect or Inhibit Moisture Infiltration.

The most effective way to reduce potential pavement distress issues related to the highly plastic clay soil is removal of the underlying highly plastic clay soil and replacement with a non-expansive or stabilized soil. Removal of the underlying fat clay to a depth of 5 feet, where present, would reduce the PVR to about 1 inch. The reduction or mitigation of pavement distress is proportional to the depth of removal and replacement.

GROUNDWATER CONTROL

It should be noted that control of surface drainage and groundwater is important to the performance and life of pavements. Infiltration of water into the pavement subgrade and pavement structure will result in premature loss of serviceability. Adequate drainage provisions should be included in the pavement design. Routine maintenance such as crack sealing is critical for the life of the pavement.

To protect the pavement from subgrade and base failure, a curb system may be incorporated into the pavement design to protect shallow seepage water from entering laterally into the pavement base course. A curb system should extend at least 6 inches below the bottom of the pavement base material.

Groundwater seepage is not anticipated for the pavements during construction. However, localized groundwater levels may rise during times of wet seasonal conditions. If groundwater seepage does occur in pavement construction, this seepage can, more likely than not, be pumped from the excavation.

CONDITIONS

Since significant variation was found in subsurface conditions at the boring locations, all parties involved should take notice that even more variation may be encountered between boring locations. Statements in the report as to subsurface variation over given areas are intended only as estimations from the data obtained at specific boring locations.

It is recommended that, upon completion of the plans and specifications and the incorporation of the recommendations herein, the geotechnical engineer be retained to review such plans to ensure proper interpretation and implementation of his recommendations in the interest of the best compromise between cost and performance. The recommendations presented in this report were developed based on the information discussed herein. If construction differs from that

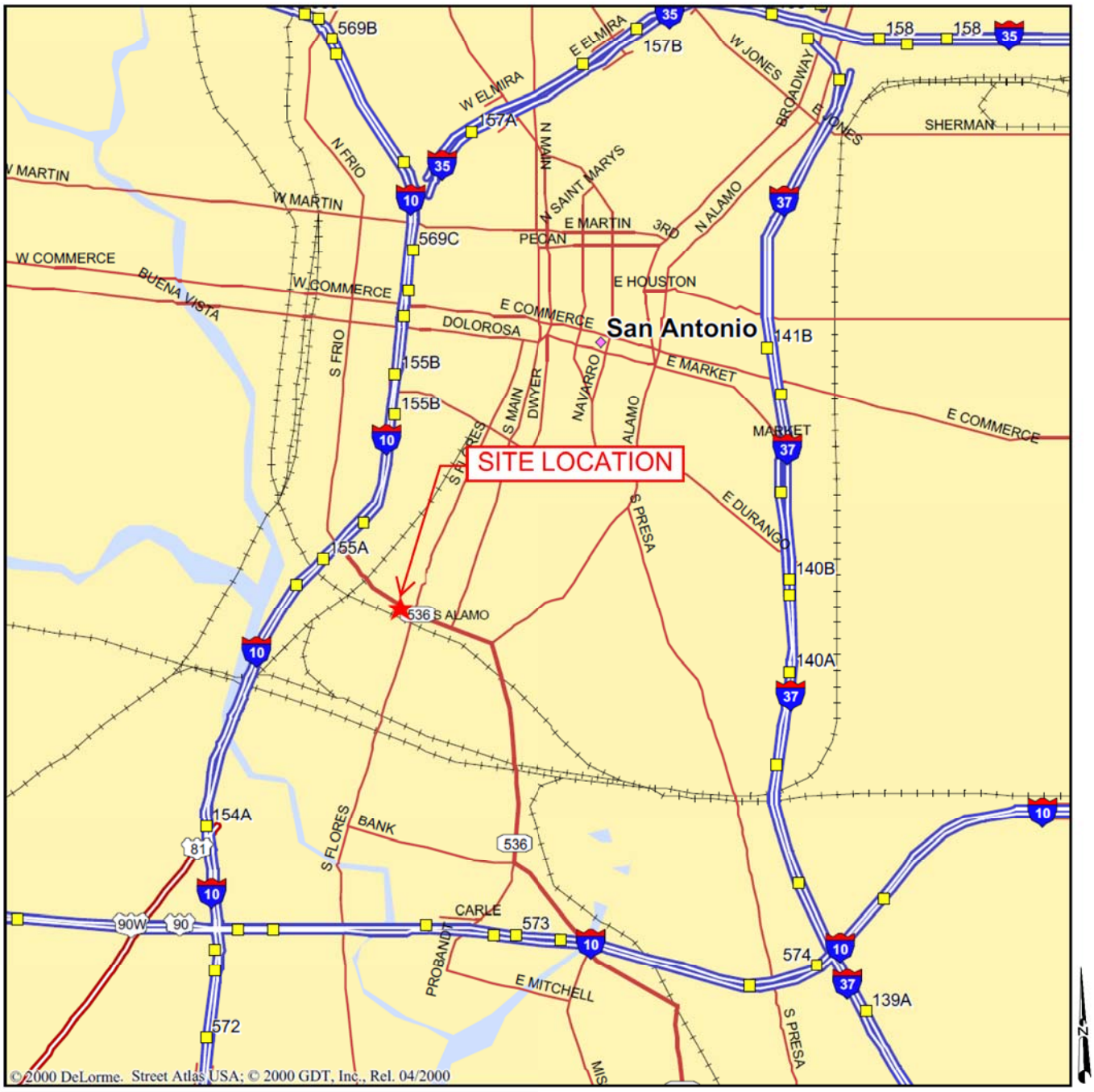
discussed herein, Fugro should be contracted to review the planned construction changes and provide new recommendations and/or design criteria, if necessary.

The professional services that form the basis for this report have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers practicing in the same locality. No warranty, express or implied, is made as the professional advice set forth. Fugro's scope of work does not include the investigation, detection, or design related to the presence of any biological pollutants. The term 'biological pollutants' includes, but is not limited to, mold, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

The results, conclusions, and recommendations contained in this report are directed at, and intended to be utilized within, the scope of work contained in the agreement executed by Fugro and client. This report is not intended to be used for any other purposes. Fugro makes no claim or representation concerning any activity or condition falling outside the specified purposes to which this report is directed, said purposes being specifically limited to the scope of work as defined in said agreement. Inquiries as to said scope of work or concerning any activity or condition not specifically contained therein should be directed to Fugro for a determination and, if necessary, further investigation.

This report was prepared for the sole and exclusive use by the client. No third party may use or rely upon the information provided in this report without our express written consent. We assume no responsibility for the unauthorized use of this report by other parties and for purposes beyond the stated project objectives and scope limitations.

PLATES



VICINITY MAP
TO-106 Development Services Parking Lot
1920 South Alamo Street
San Antonio, Texas

PLAN OF BORINGS
TO-106 Development Services Parking Lot
1920 South Alamo Street
San Antonio, Texas

LOG OF BORING NO. B-1

TO-106 Development Services Parking Lot
1920 South Alamo Street
San Antonio, Texas
REPORT NO. 04.36161002

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC/RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH, FT	WATER CONTENT, %	LIQUID LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 4 SIEVE, %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNDRAINED SHEAR STRENGTH KSF
			N = 10	FILL: dark brown and tan clayey gravel with sand	1.6							
			N = 7	FAT CLAY (CH), dark brown, stiff to very stiff								
			P = 2.5			33	78	54	100	94	89	1.6(Q)
5					6.0							
			P = 2.25	SANDY FAT CLAY (CH), light brown, very stiff, with calcareous nodules								
			P = 3.0			21	57	39	88	54	108	1.5(Q)
10					10.0							
			N = 71	SANDY LEAN CLAY (CL), tan, hard, with calcareous nodules, uncemented calcareous deposits and ferrous deposits								
15												
			N = 32			12	25	11				
20					23.0							
			N = 11	CLAYEY SAND WITH GRAVEL (SC), tan, medium dense								
25					28.0							
			N = 36	GRAVELLY FAT CLAY (CH), tan, hard, with ferrous deposits		16	52	37	69	50		
30					32.0							
			N = 27	LEAN CLAY (CL), tan, hard, with uncemented calcareous deposits								
35					35.0							

Notes:
1) Boring was advanced dry and groundwater was encountered at 25 ft depth.
2) Upon completion of boring groundwater was measured at 17.9 ft depth.

Fugro Consultants, Inc.

COMPLETION DEPTH, FT: 35.0
DATE DRILLED: 2-4-16
LONGITUDE: 98°30'5.46" W
LATITUDE: 29°24'40.88" N

KEY:
N = Standard Penetration Test, bpf
P = Pocket Penetrometer, tsf
U = Unconfined
Q = Unconsolidated Undrained Triaxial

PLATE 3

FUGRO STD SA (SOIL KSF) B LOGS.GPJ SAN ANTONIO DATA TEMPLATE.GDT 3/4/16

LOG OF BORING NO. B-2

TO-106 Development Services Parking Lot
1920 South Alamo Street
San Antonio, Texas
REPORT NO. 04.36161002

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC/RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH, FT	WATER CONTENT, %	LIQUID LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 4 SIEVE, %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNDRAINED SHEAR STRENGTH KSF
			N = 20	FILL: tan gravel with sand over brown clayey sand with gravel, medium dense		10						
			N = 10		4.0							
5			N = 13	FAT CLAY (CH), dark brown, very stiff								
			P = 4.5	- brown, with calcareous nodules below 6 ft	8.0							
			P = 4.0	GRAVELLY LEAN CLAY (CL), tan, hard, with calcareous nodules and uncemented calcareous deposits		18	33	20	77	67	106	2.3(Q)
10												
			N = 89		15.0							
15												
				Note: Boring was advanced dry and groundwater was not encountered.								
20												
25												
30												
35												

Fugro Consultants, Inc.

COMPLETION DEPTH, FT: 15.0
DATE DRILLED: 2-4-16
LONGITUDE: 98°30'3.7" W
LATITUDE: 29°24'40.15" N

KEY:
N = Standard Penetration Test, bpf
P = Pocket Penetrometer, tsf
U = Unconfined
Q = Unconsolidated Undrained Triaxial

PLATE 4

FUGRO STD SA (SOIL KSF) B LOGS.GPJ SAN ANTONIO DATA TEMPLATE.GDT 3/4/16

LOG OF BORING NO. B-3

TO-106 Development Services Parking Lot
1920 South Alamo Street
San Antonio, Texas
REPORT NO. 04.36161002

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC/RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH, FT	WATER CONTENT, %	LIQUID LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 4 SIEVE, %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNDRAINED SHEAR STRENGTH KSF
			N = 17	FILL: tan clayey sand with gravel, medium dense		9	29	13	64	25		
					2.0							
			N = 12	FAT CLAY (CH), dark brown, stiff to very stiff								
			P = 3.0			33	72	48	100	96	88	1.0(Q)
5					6.0							
			P = 4.5+	LEAN CLAY (CL), tan, very stiff to hard, with calcareous nodules								
			P = 3.75									
					10.0							
10												
15												
				Note: Boring was advanced dry and groundwater was not encountered.								
20												
25												
30												
35												

Fugro Consultants, Inc.

COMPLETION DEPTH, FT: 10.0
DATE DRILLED: 2-4-16
LONGITUDE: 98°30'5.78" W
LATITUDE: 29°24'40.22" N

KEY:
N = Standard Penetration Test, bpf
P = Pocket Penetrometer, tsf
U = Unconfined
Q = Unconsolidated Undrained Triaxial

PLATE 5

FUGRO STD SA (SOIL KSF) B LOGS.GPJ SAN ANTONIO DATA TEMPLATE.GDT 3/4/16

LOG OF BORING NO. B-4

TO-106 Development Services Parking Lot
1920 South Alamo Street
San Antonio, Texas
REPORT NO. 04.36161002

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC/RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH, FT	WATER CONTENT, %	LIQUID LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 4 SIEVE, %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNDRAINED SHEAR STRENGTH KSF
			N = 6	FILL: tan clayey gravel with sand, loose to medium dense								
			N = 21			7	22	8	56	27		
5			N = 14		5.5							
			P = 3.0	FAT CLAY (CH), dark brown, stiff to very stiff - brown, with calcareous nodules below 6 ft	7.0							
			P = 4.0	LEAN CLAY (CL), tan, hard, with calcareous nodules	10.0							
10												
15												
				Note: Boring was advanced dry and groundwater was not encountered.								
20												
25												
30												
35												

Fugro Consultants, Inc.

COMPLETION DEPTH, FT: 10.0
DATE DRILLED: 2-4-16
LONGITUDE: 98°30'3.98" W
LATITUDE: 29°24'39.55" N

KEY:
N = Standard Penetration Test, bpf
P = Pocket Penetrometer, tsf
U = Unconfined
Q = Unconsolidated Undrained Triaxial

PLATE 6

FUGRO STD SA (SOIL KSF) B LOGS.GPJ SAN ANTONIO DATA TEMPLATE.GDT 3/4/16

TERMS AND SYMBOLS USED ON BORING LOGS FOR SOIL

SOIL TYPES

- CH, fat clays
- SC, clayey sands
- GC, clayey gravels
- CL, lean clays
- SM, silty sands
- GM, silty gravels
- ML, silts
- SW, well graded
- GW, well graded gravels
- Fill, unclassified
- SP, poorly-graded sands
- GP, poorly graded gravels

SAMPLER TYPES

- Thin-Walled Tube
- Auger Sample
- Standard Penetration Test

SOIL GRAIN SIZE

U.S. STANDARD SIEVE

6"		3"	3/4"	4	10	40	200		
BOULDERS	COBBLES	GRAVEL		SAND				SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE			
152	76.2	19.1		4.76	2.00	0.420	0.074		0.002

SOIL GRAIN SIZE IN MILLIMETERS

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	UNDRAINED [2] SHEAR STRENGTH Kips Per Sq. Ft.	NUMBER OF BLOWS [3] PER FT., N
Very Soft	Less Than 0.25	Less Than 2
Soft	0.25 to 0.50	2 to 4
Firm	0.5 to 1.00	4 to 8
Stiff	1.00 to 2.00	8 to 16
Very Stiff	2.00 to 4.00	16 to 32
Hard	greater than 4.00	greater than 32

CONDITION OF GRANULAR SOILS [2]

NUMBER OF BLOWS PER FT., N	RELATIVE DENSITY
0-4	Very Loose
4-10	Loose
10-30	Medium
30-50	Dense
Over 50	Very Dense

STRUCTURE [1]

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 6 mm thick.
Laminated	Alternating layers of varying material or color with the layers less than 6 mm thick.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided Fissured	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusions of small pockets of different soils

MOISTURE [1]

Dry	-No water evident in sample; fines less than plastic limit.
Moist	-Sample feels damp; fines near the plastic limit
Wet	-Sample bears free water; fines greater than liquid limit
▽	-Free water first observed during drilling.
▼	-Final water measurement at completion of boring.

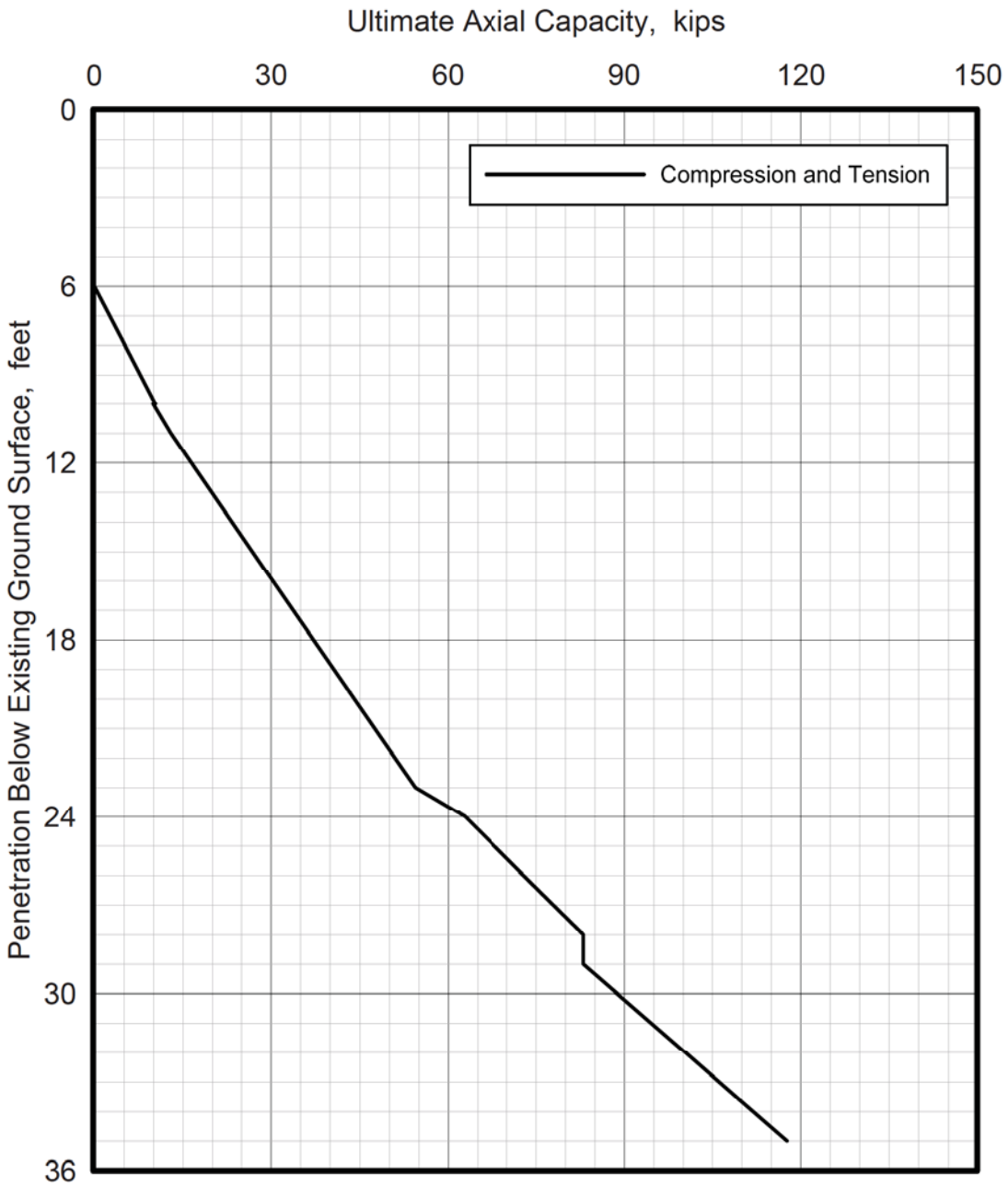
INCLUSIONS [1]

Parting	-Inclusion <1/8" thick extending through sample.
Seam	-Inclusion 1/8" to 3" thick extending through sample.
Layer	-Inclusion >3" thick extending through sample.
Trace	-<5% of sample.
Few	-5% to 10% of sample.
Little	-10% to 25 % of sample.
Some	-30% to 45% of sample.

REFERENCES:

1) ASTM D 2488
2) Peck, Hanson, and Thornburn, (1974), Foundation Engineering.
3) Das, Braja M., (2002), Principles of Geotechnical Engineering, 5th Edition

Information on each boring log is a compilation of subsurface conditions and soil and rock classifications obtained from the field as well as from laboratory testing of samples. Strata have been interpreted by commonly accepted procedures. The stratum lines on the logs may be transitional and approximate in nature. Water level measurements refer only to those observed at the times and places indicated, and may vary with time, geologic condition or construction activity.



NOTES:

1. This curve represents ***ultimate*** values of a drilled shaft for compression and tension (without end bearing). We recommend a factor of safety of 3.0 be applied to the ultimate axial capacity for shafts loaded in sustained and transient compression and tension.
2. This curve is for a single isolated shaft. Group effects are discussed in the text.
3. Installation guidelines are discussed in the text.
4. Tension capacity should be limited to the depth of steel reinforcement that can develop proposed tensile loads.
5. The potential skin friction capacity in the upper 5-ft of soil is neglected to account for potential disturbance associated with pile installation.
6. These curves are applicable to 2-ft of fill or less.

Fugro Consultants, Inc.

UNIT DIAMETER DRILLED SHAFTS
TO-106 Development Services Parking Lot
1920 South Alamo Street
San Antonio, Texas

Project No.: 04.36161002

Reviewed by: Jennifer Hooijkaas	Date: 03/03/16	Approved by: Eric R. Marx	Date: 03/03/16	**PLATE 8**

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

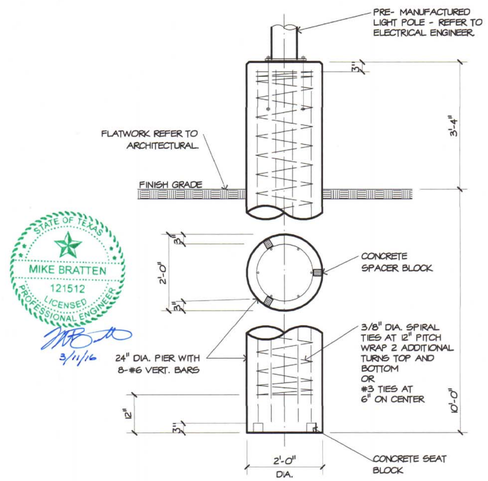
Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
THE BEST PEOPLE ON EARTH

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

Copyright 2004 by ASFE, Inc. Duplication, reproduction, or copying of this document, in whole or in part, by any means whatsoever, is strictly prohibited, except with ASFE's specific written permission. Excerpting, quoting, or otherwise extracting wording from this document is permitted only with the express written permission of ASFE, and only for purposes of scholarly research or book review. Only members of ASFE may use this document as a complement to or as an element of a geotechnical engineering report. Any other firm, individual, or other entity that so uses this document without being an ASFE member could be commiting negligent or intentional (fraudulent) misrepresentation.

IIGER06085.0MRP



STATE OF TEXAS
MIKE BRATTEN
121512
LICENSED
PROFESSIONAL ENGINEER
3/11/16

LP1- Light Pole Pier Footing

Structural Design Criteria

1) Fugro Consultants investigated the subsurface soils and provided foundation design recommendations. (Report Number 04.36161002) Beicker Consultants LLC based the foundation design upon this information.

2) Structural design is based on the following:
Light Pole wind load: 450# total lateral load
Light Pole dead load: 200# light pole (assumed) + weight of concrete pier (Vol. x 150 pcf)

Concrete

1) Reinforcing steel shall comply with the requirements of ASTM A-615, grade 60. Reinforcing steel shall be continuous with splices lapped at least 40 diameters. Stirrups and ties may be grade 40 for bars #3 and smaller. Tie wire shall be 18 gage annealed type.

2) Concrete shall develop a 28-day compressive stress (f'c) of at least 3,000 psi with 6 - 7" slump for piers. Mix concrete according to ACI 301. Water cement ratio shall not exceed 0.50. Use a maximum aggregate size of 1 1/8" or according to ACI 318. Maximum aggregate size between bars shall also pertain to between the forms and bars.

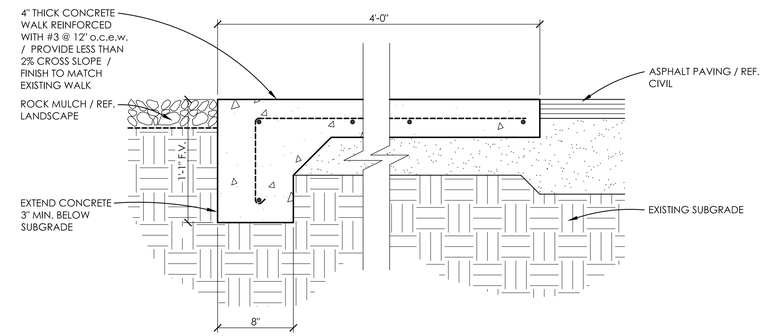
THE STRUCTURAL DOCUMENTS REPRESENT THE FINISHED STRUCTURE. TOTAL PROJECT DEFINITION (AND THEREFORE DEFINITION OF ALL REQUIREMENTS) WILL BE PROVIDED BY COMBINING ALL DOCUMENTS WITH THE STRUCTURAL DOCUMENTS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, CONDITIONS, AND DOCUMENTS AND NOTIFY THE ARCHITECT OF ANY ERRORS, OMISSIONS, OR CONDITIONS THAT MAY AFFECT THE OPERATION OF THE STRUCTURE. DO NOT SCALE DRAWINGS. DIMENSIONS TO BE ESTABLISHED IN FIELD. INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO PROTECT THE SAFETY OF THE PUBLIC ALONG WITH THE SAFETY OF THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE BUT NOT BE LIMITED TO, BRACING, SHORING, OR GUYING. THE CONTRACTOR SHALL BE RESPONSIBLE TO CORRECT, AT HIS OWN EXPENSE ANY SUBSURFACE, STRUCTURAL DAMAGE OR OTHER ADDITIONAL CONDITIONS CAUSED BY HIS OPERATIONS.

BEICKER CONSULTANTS, LLC F-17115 STRUCTURAL / CONSTRUCTION ENGINEERS

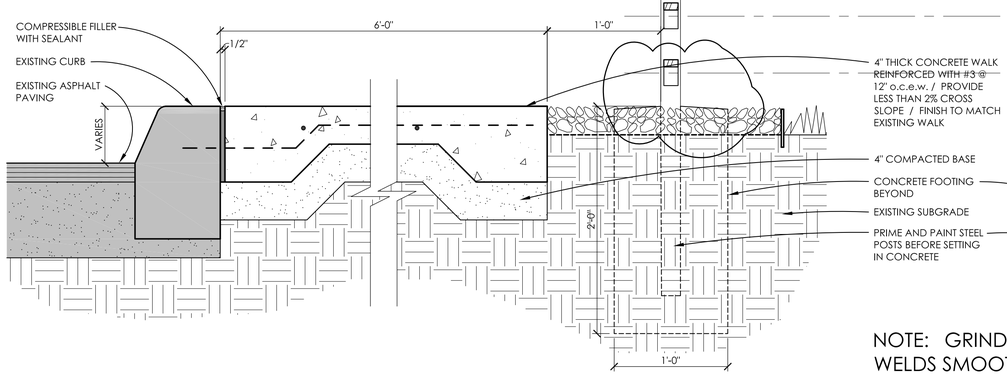
BEATY PALMER ARCHITECTS Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205
voice 210.212.8022
fax 210.212.8018
www.beatypalmer.com

PROJECT	JOB NO.	DATE
COSA - DSD Parking Lot Light Pole 1902 S. Alamo Street San Antonio, Texas	12350-4	Mar. 11, 2015
	SCALE 1/2" = 1'-0"	SHEET S1.1

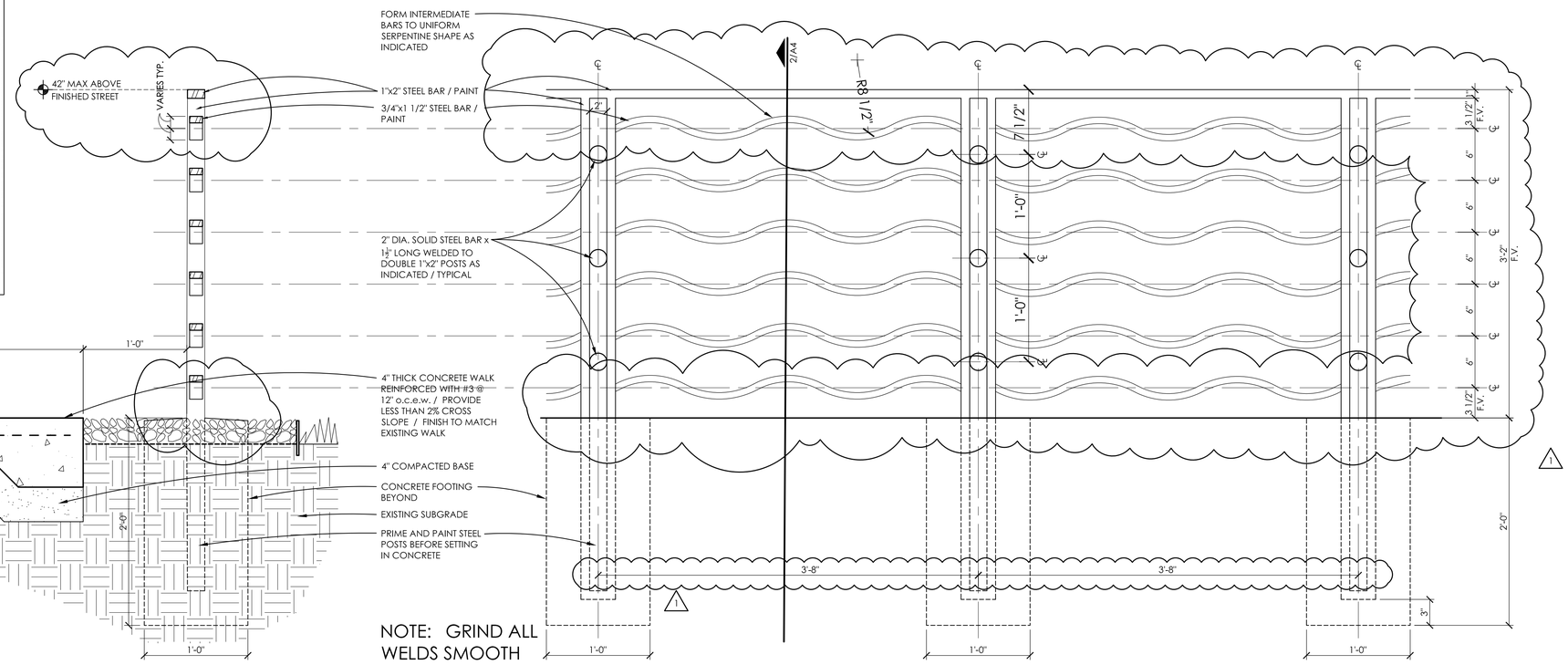
Copyright © 2016 Beicker Consultants, LLC Structural / Construction Engineers ● 2702 N Loop 1604 E, Suite 201 ● San Antonio, Texas, 78232 ● Phone (210) 824-2908 ● Fax (210) 496-9330



3 SECTION DETAIL
1 1/2" = 1'-0" CONCRETE WALK



2 SECTION / ELEVATION
1 1/2" = 1'-0" ORNAMENTAL FENCE



1 ELEVATION
1 1/2" = 1'-0" ORNAMENTAL FENCE

architect

REGISTERED ARCHITECT
TIMOTHY W. PALMER
16751
STATE OF TEXAS
4.5.16

revisions
ADDENDUM NO.1 04.05.16

DSD Staff Parking Lot

1902 S. Alamo Street
San Antonio, Texas 78204

project number
1538

date
03.11.16

drawn by
MAS

checked by
TWP

Beaty Palmer Architects, Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205
voice 210.212.8022
fax 210.212.8018
www.beatypalmer.com

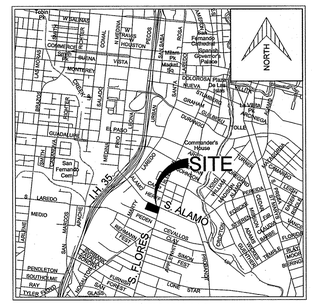
sheet number
A4

CITY OF SAN ANTONIO

BEATY PALMER ARCHITECTS

DSD STAFF PARKING LOT
SOUTH ALAMO STREET AND SOUTH FLORES STREET

SAN ANTONIO, TEXAS



LOCATION MAP
NOT TO SCALE

Sheet List Table	
SHEET NUMBER	SHEET TITLE
C1	COVER SHEET
C2	SITE PLAN
C3	GRADING PLAN
C4	UTILITY PLAN
C5	EROSION CONTROL PLAN
C6	ENHANCED CROSSWALK PLAN
C7	SITE DETAILS
C8	SITE DETAILS

ADDENDUM 1
SHT. C2 - ADDED MORE DIMENSION DETAIL
- REMOVED THE KEY NOTES FOR LIGHT DUTY PAVEMENT
- REMOVED RETAINING WALL GENERAL NOTES

SHT. C3 - REMOVED RETAINING WALL GENERAL NOTES

SHT. C4 - ADJUSTED THE IRRIGATION METER LOCATION.

SHT. C6 - ADDED DETAIL KEY NOTES.

SHT C7 - REVISED DETAIL (F / C7)
- REVISED DETAIL (G / C7)

SHT C8 - ADDED PEDESTRIAN SIGNAL HEAD DETAILS (S / C8)

20160405

STATE OF TEXAS
JUSTIN R. SHIPPEY
103767
LICENSED
PROFESSIONAL ENGINEER

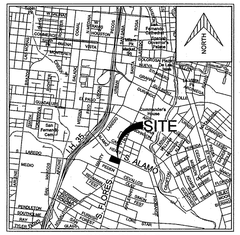
PRIMARY CONTACT PERSON: - JUSTIN R. SHIPPEY

MACINA • BOSE • COPELAND & ASSOC., INC.
CONSULTING ENGINEERS AND LAND SURVEYORS
1035 Central Parkway North, San Antonio, Texas 78232
(210) 545-1122 Fax (210) 545-9302 www.mbcengineers.com
FIRM REGISTRATION NUMBER: T.B.P.E. F-784 & T.B.P.L.S. 10011700

ISSUED FOR PERMIT
04-05-2016

PLAT ID# 070713
A/P#
DATE 01/28/16
JOB NO. 31336-1269

Date: Apr 05, 2016, 4:46pm User ID: mhartke Layout: Layout1
File: J:\31336\Development Services\Hwy Improvements\Design Civil\sh-cover sheet-31336.dwg Layout name: Layout1



LOCATION MAP
NOT TO SCALE

SITE CONCRETE DRAINAGE NOTES:

1. EXPOSED CONCRETE SURFACES SHALL BE BROOM FINISHED.

2. ANY IRREGULAR AREA SHALL BE HAND RUBBED TO A SMOOTH FINISH.

3. ALL EXPOSED EDGES SHALL RECEIVE A 3/4" CHAMFER.

4. ALL MATERIALS AND WORKMANSHIP SHALL BE DONE IN ACCORDANCE WITH CITY OF SAN ANTONIO STANDARD SPECIFICATIONS, AS WELL AS ITEM 360 (TXDOT STD SPECS, LATEST ED.)

5. JOINTS TO BE COMPLETED PRIOR TO CONCRETE SHRINKAGE OCCURRING.

PARKING TABULATION	
91	REGULAR SPACES
0	ACCESSIBLE SPACES
0	VAN ACCESSIBLE SPACES
91	TOTAL SPACES

DEVELOPMENT SERVICES PARKING TRIBULATION	
326*	REGULAR SPACES
9*	ACCESSIBLE SPACES
2*	VAN ACCESSIBLE SPACES
337*	TOTAL SPACES

* BASED ON AERIAL INFORMATION

Line Table

Line #	Bearing	Length
L1	N 66°10'35" W	14.00'
L2	S 23°49'25" W	9.07'

Curve Table

Curve #	Length	Radius	Delta	Tangent	Chord Bearing	Chord Length
C1	50.23'	35.00'	82°13'31"	30.55'	S 24°45'09" E	46.03'

NORTH

SCALE: 1" = 20'

20 0 10 20 40

LEGEND

- PROPOSED CONCRETE HEADER CURB
- PROPOSED CONCRETE CURB
- EXISTING CONCRETE CURB
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- PROPOSED FIRE DEPARTMENT CONNECTION
- PROPOSED REMOTE FIRE DEPARTMENT CONNECTION
- MISC. TRAFFIC SIGN
- GUARD POST
- EXISTING WATER VALVE
- PROPOSED WATER VALVE
- LIGHT POLE
- POWER POLE
- EXISTING MANHOLE
- PROPOSED MANHOLE
- GRATE
- TRAFFIC LIGHT
- GUY WIRE ANCHOR
- ACCESSIBLE PARKING
- DETAIL REFERENCE — DETAIL / SHEET NUMBER
- EXISTING CONCRETE AREAS
- WHEELSTOP
- EXISTING FENCE
- PROPOSED FENCE
- EXISTING OVERHEAD ELECTRIC
- RETAINING WALL (REF. STRUCTURAL DWGS)
- SAWTOOTH CURB
- SINGLE LAMP LIGHT POLE
- DOUBLE LAMP LIGHT POLE

GENERAL SITE NOTES

1. CONTRACTOR SHALL COMPLY WITH THE CITY OF SAN ANTONIO BUILDING CODE AND REGULATIONS AND APPLICABLE TECHNICAL SPECIFICATIONS IN THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION FOR THE CITY OF SAN ANTONIO," AS WELL AS OTHER SAFETY CODES AND INSPECTION PROVISIONS APPLICABLE TO THIS PROJECT.

2. CONTRACTOR SHALL SECURE ALL PERMITS REQUIRED FOR CONSTRUCTION AND SHALL NOTIFY ALL RESPECTIVE GOVERNMENTAL OR UTILITY AGENCIES AFFECTED BY CONSTRUCTION PRIOR TO STARTING CONSTRUCTION.

3. LOCATION OF EXISTING UTILITIES, AS SHOWN ON THESE PLANS, IS BASED ON A COMBINATION OF FIELD SURVEYING AND AVAILABLE UTILITY MAPS. CONTRACTOR TO DETERMINE VERTICAL AND HORIZONTAL LOCATIONS OF ALL UTILITIES (WHETHER SHOWN ON PLANS OR NOT) BY COORDINATING WITH THE RESPECTIVE UTILITY AGENCIES PRIOR TO CONSTRUCTION. THE FOLLOWING ARE NUMBERS OF THE RESPECTIVE AGENCIES:

SAN ANTONIO WATER SYSTEM (WATER) 233-2009
SAN ANTONIO WATER SYSTEM (SEWER) 233-2009
CPS ENERGY (GAS & ELECTRIC) 978-3500
AT&T (TELEPHONE) 820-6229
TIME WARNER CABLE (TELEVISION) 675-4560
VALERO ENERGY CORP. 246-2394
TESS-STATEWIDE ONE CALL DAMAGE PREVENTION SYSTEM FOR BURIED UTILITIES. . . 1-800-DIG-TESS

IF ANY NUMBER HAVE CHANGED OR ARE INCORRECT, THE CONTRACTOR IS STILL RESPONSIBLE FOR CONTACTING THE AGENCIES.

4. REMOVE ALL ASPHALT AND CONCRETE WITH A SMOOTH SAW-CUT.

5. COMPACT ALL PAVEMENT SUBGRADE TO 95% MAXIMUM DRY DENSITY. COMPACT AREAS TO RECEIVE LANDSCAPING AND/OR GRASS TO 85%.

6. PRIOR TO BIDDING, THE CONTRACTOR SHALL THOROUGHLY INVESTIGATE THE SITE AND FAMILIARIZE HIMSELF WITH ALL ASPECTS OF THE SITE WHICH MAY AFFECT HIS WORK. THIS INCLUDES ACCOUNTING FOR ALL VISIBLE FEATURES WHICH MAY IMPACT THE BID OR THE WORK.

7. CONTRACTOR SHALL CAREFULLY DEMOLISH AND REMOVE ALL ITEMS (ABOVE AND BELOW GROUND) AS REQUIRED TO CONSTRUCT THE PROJECT AS SHOWN. ALL REMOVAL AND DISPOSAL ACTIVITIES MUST COMPLY WITH APPLICABLE CODES, LAWS AND ORDINANCES.

8. REMOVE AND DISPOSE OF ALL EXCESS EXCAVATION.

9. CONTRACTOR IS RESPONSIBLE FOR ALL VERTICAL AND HORIZONTAL CONTROL.

10. BASE MATERIAL AND INSTALLATION TO BE IN CONFORMANCE WITH ITEM 247 (TxDOT. STD. SPECS. LATEST ED.), TYPE A GRADE 2. COMPACT TO 95% MAXIMUM DRY DENSITY OF THE MODIFIED PROCTOR OR 98% MAXIMUM DRY DENSITY OF THE STANDARD PROCTOR.

11. LIME STABILIZED SUBGRADE SHALL BE COMPACTED WITHIN 3% OF OPTIMUM MOISTURE CONTENT TO AT LEAST 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY STANDARD PROCTOR.

12. PRIME COAT MATERIAL AND INSTALLATION TO BE CUT-BACK ASPHALT TYPE IN ACCORDANCE WITH ITEM 310 (TxDOT. STD. SPECS. LATEST ED.) (0.2 GAL/S.Y.).

13. ALL ASPHALT MATERIAL AND INSTALLATION TO COMPLY WITH ITEM 340 TYPE "C" (TxDOT. STD. SPECS. LATEST ED.).

14. WHEELSTOPS SHALL BE OF PRE-CAST CONCRETE AND 6' IN LENGTH. DOWEL PRE-CAST CONCRETE WHEEL STOPS A MINIMUM OF 12" INTO BASE AND PAVEMENT.

15. CONTRACTOR TO FULLY COOPERATE WITH PARKING LOT LIGHT CONTRACTOR.

16. ALL SITE CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3000 P.S.I. IN 28 DAYS UNLESS OTHERWISE NOTED. ALL MATERIALS AND METHODOLOGIES USED SHALL CONFORM WITH ITEM 360 (TXDOT. STD. SPECS, LATEST ED.)

17. FOR ALL STRIPING AND TRAFFIC CONTROL MARKINGS, CONTRACTOR TO USE GLIDDEN TRAFFIC PAINT #63228 OR SHERWIN-WILLIAMS PRO-MAR TRAFFIC MARKING PAINT (SERIES B29W1). COLOR IS WHITE. APPLY TWO COATS.

18. INSTALL "NO PARKING - FIRE LANE" SIGNS IN ACCORDANCE WITH THE FIRE MARSHALL'S REQUIREMENTS. PAINT CURBS AS REQUIRED BY FIRE MARSHALL.

19. DIMENSIONS ARE TO THE PAVEMENT EDGE OF THE CURB, FACE OF BUILDING OR PROPERTY LINE, OR STRIPING CENTERLINE.

20. THE CONCRETE DRIVE APPROACHES WITHIN CITY RIGHT-OF-WAY ARE SUBJECT TO CITY AND TxDOT INSPECTION.

21. MAXIMUM SIDEWALK CURB CONTROL JOINT SPACING IS 5 FEET.

22. MAXIMUM SIDEWALK CURB EXPANSION JOINT SPACING IS 40 FEET.

23. CONTRACTOR MUST KEEP ALL PERMITS ON JOB SITE.

24. ALL EXISTING SIGNS AND BENCHES (WHETHER SHOWN ON PLANS OR NOT) WHICH CONFLICT WITH CONSTRUCTION SHALL BE RELOCATED.

25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING EXISTING SPRINKLER SYSTEM COMPONENTS WHICH CONFLICT WITH CONSTRUCTION.

26. PROPOSED CURBING TO BE TRANSITIONED SMOOTHLY TO MATCH EXISTING.

27. THE CONSTRUCTION SITE IS TO BE THOROUGHLY CLEANED BY THE CONTRACTOR PRIOR TO ISSUANCE OF PAYMENT BY THE OWNER.

28. CONTRACTOR SHALL INCLUDE ALL COSTS FOR ROUTING PEDESTRIAN AND VEHICULAR TRAFFIC IN THE BID AMOUNT. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH THE CURRENT LEASE HOLDER IN ORDER TO INSURE CONVENIENT ACCESS.

29. DASHED LINES REPRESENT EXISTING IMPROVEMENTS.

30. P.C. = POINT OF CURVATURE, P.R.C. = POINT OF REVERSE CURVATURE, P.T. = POINT OF TANGENCY, P.C.C. = POINT OF COMPOUND CURVATURE.

31. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATION. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

32. REFERENCE DETAILS FOR HANDICAP SIGNAGE.

33. BARRICADES AND WARNING SIGNS SHALL CONFORM TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND GENERALLY BE LOCATED TO AFFORD MAXIMUM PROTECTION TO THE PUBLIC AS WELL AS CONSTRUCTION PERSONNEL AND EQUIPMENT AND TO ASSURE AN EXPEDITIOUS TRAFFIC FLOW AT ALL TIMES DURING CONSTRUCTION. DURING THE PROGRESS OF THE WORK THE CONTRACTOR SHALL PROVIDE ACCESS FOR LOCAL TRAFFIC.

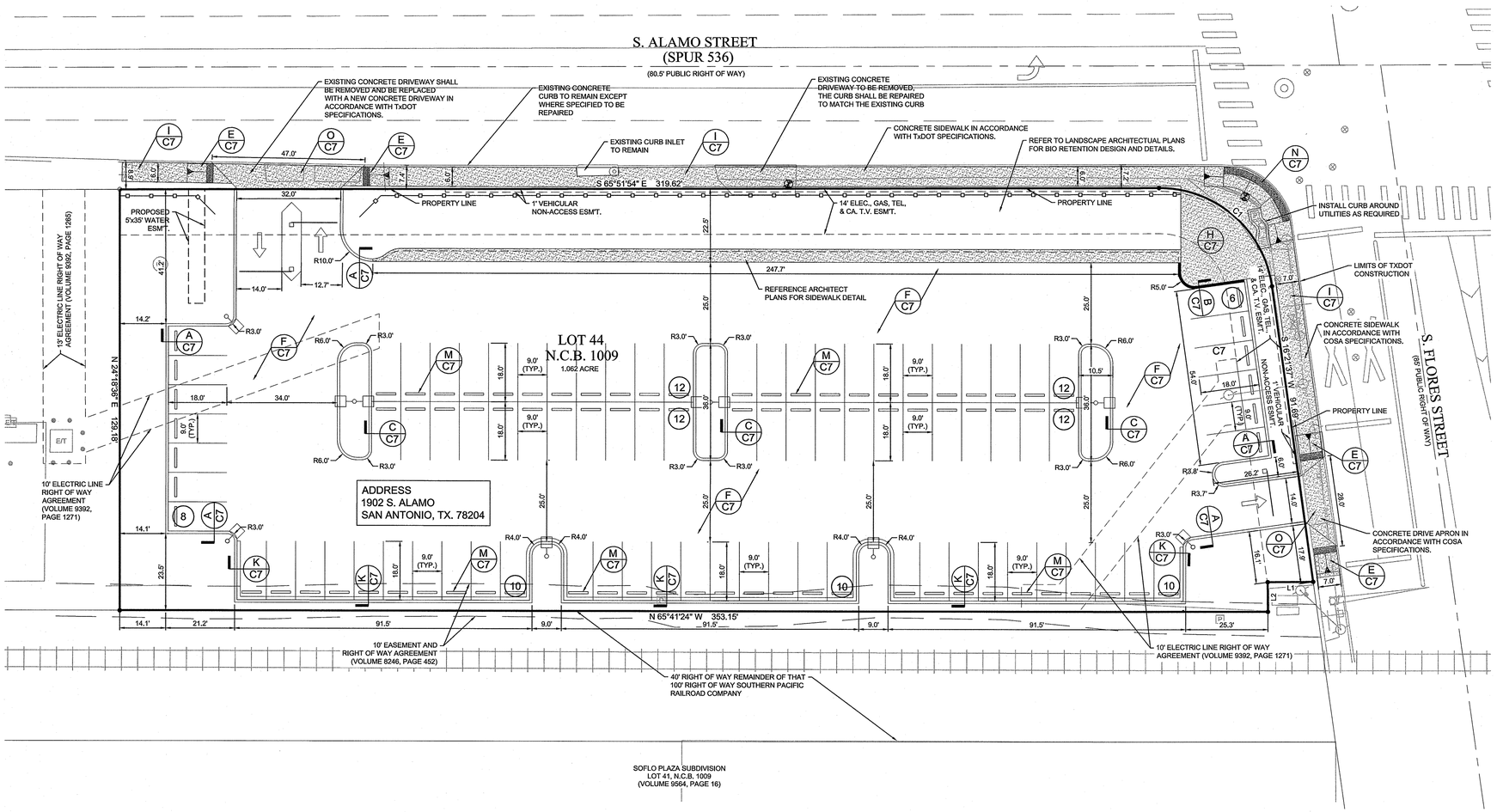
34. ITEMS OF WORK NOTED "BY OTHERS" SHALL BE CONSIDERED AS NOT PART OF THIS CONTRACT.

35. THE CONTRACTOR SHALL COORDINATE (WITH OWNER/ARCHITECT) WHICH TREES ARE TO BE PROTECTED DURING CONSTRUCTION. CONTRACTOR SHALL PROTECT ACCORDINGLY AND PROVIDE WATER AS REQUIRED.

36. ON ALL GRAVITY LINES, CONTRACTOR MUST START AT DOWNSTREAM END AND PROCEED UPSTREAM TAKING CARE TO EXPOSE ALL EXISTING UTILITIES AND STRUCTURES WHICH MAY CONFLICT WITH THE PROPOSED LINE. ANY OTHER SEQUENCE OF CONSTRUCTION WILL BE AT THE CONTRACTOR'S RISK.

37. IN CASES WHERE HYDROMULCH HAS BEEN PROPERLY APPLIED, CONTRACTOR TO PROVIDE WATER AS REQUIRED TO ACHIEVE A MINIMUM OF 75% GERMINATION TOWARDS SUBSTANTIAL GROWTH.

38. PEDESTRIAN RAILING OR FENCING SHALL BE INSTALLED ALONG ALL RETAINING WALLS OR VERTICAL DROPS GREATER THAN 24". CONTRACTOR SHALL COORDINATE WITH OWNER AND/OR LANDSCAPE ARCHITECT FOR DESIGN AND SPECIFICATIONS. ANY RAILING REQUIRED CLOSER THAN 10' TO A DRIVE LANE OR PARKING SPACE MAY NEED TO BE A TRAFFIC BARRIER. CONTRACTOR TO COORDINATE WITH ENGINEER.



NOTE: THE CURB ALONG S. FLORES AND S. ALAMO WILL BE REQUIRED TO BE REPAIRED IN VARIOUS LOCATIONS. THE CONTRACTOR SHALL INCLUDE APPROXIMATELY 40 L.F. OF CURB REPAIR IN THE BID. THE CONTRACTOR SHALL REPAIR THE CURB AS REQUIRED BY THE CITY INSPECTOR DURING CONSTRUCTION. THE CURB SHALL BE REPAIRED IN ACCORDANCE WITH TxDOT SPECIFICATIONS ALONG S. ALAMO AND COSA SPECIFICATIONS ALONG S. FLORES. THE CURB REPAIR IS IN ADDITION TO PROPOSED RAMPS AND DRIVEWAY CONSTRUCTION.

NOTE: THE CONTRACTOR SHALL INCLUDE IN THE BID THE TRAFFIC AND PEDESTRIAN CONTROL PLANS, DESIGN, AND THE IMPLEMENTATION OF CONTROL DEVICES AS REQUIRED FOR CONSTRUCTION.

NOTE: PRIOR TO THE COMPLETION OF CONSTRUCTION THE CONTRACTOR SHALL DEMOLISH THE EXISTING CHAIN LINK FENCE AROUND THE PERIMETER.

NOTE: REFER TO ARCHITECTURAL PLANS FOR PROPOSED FENCING AND GATE DETAILS.

ISSUED FOR PERMIT
04-05-2016

mbc ENGINEERS
1035 Central Parkway North
San Antonio, Texas 78232
(210) 545-1122
FAX (210) 545-9402
FIRM REGISTRATION NUMBER:
T.B.P.E. F-284 &
T.B.P.L.S. 10011700
JOB NO. 31336- 1269

SITE PLAN

ENGINEER

STATE OF TEXAS
JUSTIN R. SHIPPEY
103767
LICENSED
PROFESSIONAL ENGINEER
2016.04.05

REVISIONS

1 SEE SHEET C1

DSD STAFF PARKING LOT

SAN ANTONIO, TEXAS

CITY OF SAN ANTONIO

project number
1538

date
03.09.16

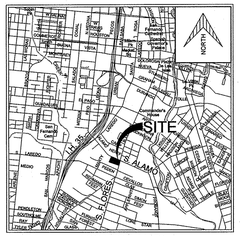
drawn by
RC

checked by
JRS

Beaty Palmer Architects, Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205
voice 210.212.8022
fax 210.212.8018
www.beatypalmer.com

sheet number
C2

BEATY PALMER ARCHITECTS



LOCATION MAP
NOT TO SCALE

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROPERLY PLAN AND CONSIDER EXISTING AND PROPOSED DRAINAGE PATTERNS DURING THE CONSTRUCTION OF THE PROJECT. IN ORDER TO ACCOMPLISH THIS, IT MAY BE NECESSARY TO PHASE THE GRADING, CONSTRUCT TEMPORARY BERMS AND SWALES WHILE FACTORING IN SURROUNDING CONDITIONS TO PROPERLY DIRECT AND CONTROL SURFACE RUNOFF. ADDITIONALLY, THE CONTRACTOR SHOULD TAKE INTO ACCOUNT THE TIMING OF CONSTRUCTING PONDS, CHANNELS AND STORM DRAINAGE SYSTEMS.

BENCHMARK #1

DESCRIPTION

MAG SET IN CONCRETE APRON ALONG THE WEST PROPERTY LINE 4.5' FROM THE EDGE OF PAVEMENT OF ALAMO STREET.

ELEVATION =637.06

NOTE:
PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS TO VERIFY THE BENCHMARK DEPICTED ON THIS DRAWING AND REPORT ANY DISCREPANCIES IN THE ELEVATION OR DESCRIPTION TO THE CIVIL ENGINEER IMMEDIATELY.

BENCHMARK #2

DESCRIPTION

MAG SET IN CURB ON THE SOUTHWEST INTERSECTION OF ALAMO STREET AND FLORES STREET 10' FROM TRAFFIC LIGHT ON SAME CORNER.

ELEVATION =637.63

NOTE:
PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS TO VERIFY THE BENCHMARK DEPICTED ON THIS DRAWING AND REPORT ANY DISCREPANCIES IN THE ELEVATION OR DESCRIPTION TO THE CIVIL ENGINEER IMMEDIATELY.

NORTH

SCALE: 1" = 20'

20 0 10 20 40

LEGEND

59.50TC / 59.00GU	EXISTING TOP OF CURB AND GUTTER ELEVATIONS
+ 59.00	EXISTING SPOT ELEVATION
100	PROPOSED CONTOUR (REPRESENT FINISHED TOP OF PAVEMENT OR TOPSOIL)
950	EXISTING CONTOUR
	PROPOSED RIDGE
	DEFINED SWALE
FF=1000.00	PROPOSED FIN. FLOOR ELEVATION
FGL=100.00	PROPOSED "FLOATING GARAGE"
	PROPOSED FOUNDATION BREAKS
	OVERLAND FLOW DIRECTION
	BENCHMARK
	GRATE
SD	PROPOSED STORM DRAIN
SD	EXISTING STORM DRAIN
100.00 INV	PROPOSED POND INVERT
100.00 TOW	PROPOSED TOP OF RETAINING WALL
100.00 BOW	PROPOSED BOTTOM OF RETAINING WALL
100.00	PROPOSED SPOT ELEVATION (REPRESENT FINISHED TOP OF PAVEMENT OR TOPSOIL)

GRADING AND DRAINAGE GENERAL NOTES

1. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATION. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

2. MINIMUM ASPHALT SLOPE SHALL BE 1% UNLESS OTHERWISE SHOWN.

3. CONTRACTOR SHALL GRADE SMOOTHLY BETWEEN PROPOSED SPOT ELEVATIONS AND BETWEEN FINISHED CONTOURS.

4. CONTRACTOR IS RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL.

5. REMOVE AND DISPOSE OF ALL LOOSE OR ORGANIC MATERIAL FROM AREA TO RECEIVE PAVING OR FILL.

6. SCARIFY EXISTING SUBGRADE BENEATH PARKING LOT AND RECOMPACT TO 95% OF THE MAXIMUM DRY DENSITY. REF: GEOTECH. REPORT FOR ADDITIONAL PROCEDURES & REQUIREMENTS.

7. THIS PLAN IS TO BE USED FOR SITE GRADING ONLY.

8. LOCATION OF EXISTING UTILITIES, AS SHOWN ON THESE PLANS IS BASED ON A COMBINATION OF FIELD SURVEYING AND AVAILABLE UTILITY MAPS. CONTRACTOR TO DETERMINE VERTICAL AND HORIZONTAL LOCATIONS OF ALL UTILITIES (WHETHER SHOWN ON PLANS OR NOT) BY COORDINATING WITH THE RESPECTIVE UTILITY AGENCIES PRIOR TO CONSTRUCTION. THE FOLLOWING ARE NUMBERS OF THE RESPECTIVE AGENCIES:

SAN ANTONIO WATER SYSTEM (WATER) 233-2009
SAN ANTONIO WATER SYSTEM (SEWER) 233-2009
CPS ENERGY (GAS & ELECTRIC) 978-3500
AT&T (TELEPHONE) 820-6229
TIME WARNER CABLE (TELEVISION) 675-4560
VALERO ENERGY CORP. 246-2394
TESS-STATEWIDE ONE CALL DAMAGE PREVENTION SYSTEM FOR BURIED UTILITIES. . . 1-800-DIG-TESS

IF ANY NUMBERS HAVE CHANGED OR ARE INCORRECT, THE CONTRACTOR IS STILL RESPONSIBLE FOR CONTACTING THE AGENCIES.

9. FINISHED EARTH SLOPES SHALL BE AT 1% MINIMUM AND SHALL NOT EXCEED 3:1.

10. ALL GRASSED AREAS AFFECTED BY THIS CONSTRUCTION SHALL BE RESODDED BY THE CONTRACTOR WITH A GRASS SIMILAR TO THE EXISTING.

11. PRIOR TO BIDDING, THE CONTRACTOR SHALL THOROUGHLY INVESTIGATE THE SITE AND FAMILIARIZE HIMSELF WITH ALL ASPECTS OF THE SITE WHICH MAY AFFECT HIS WORK. THIS INCLUDES ACCOUNTING FOR ALL VISIBLE FEATURES WHICH MAY IMPACT THE BID OR THE WORK.

12. REMOVE AND PROPERLY DISPOSE OF EXCESS EXCAVATION AND DEBRIS.

13. CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING ALL EXISTING GRATES, VALVES, CLEANOUTS, MANHOLES, VAULT TOPS, ETC. TO THE FINISHED GRADES AS SHOWN ON THE PLANS.

14. REFERENCE GEOTECHNICAL REPORT FOR ADDITIONAL REQUIREMENTS CONCERNING FILL PLACEMENT AND PAD PREPARATION. REFERENCE SOILS REPORT FOR PAVING SECTION AND SUBGRADE PREPARATION.

15. ALL EXCAVATION SHALL BE UNCLASSIFIED.

16. ALL STORM DRAINS TO BE R.C.P., CONTECH A-2000, ULTRA FLO SPIRAL RIBBED CMP, ADS HP HDPE, OR ENGINEER APPROVED EQUIVALENT.

17. ALL STORM DRAINAGE STRUCTURES TO BE BY HANSON, OLDCASTLE, PARK OR APPROVED EQUAL.

18. CONTRACTOR SHALL EXPOSE ALL EXISTING UTILITIES CROSSING PROPOSED GRAVITY LINES AND INSURE THERE WILL BE NO CONFLICTS PRIOR TO BEGINNING CONSTRUCTION. ADDITIONALLY, CONTRACTOR TO PLAN UTILITY LINE INSTALLATIONS IN A MANNER TO AVOID CONFLICTS WITH PROPOSED GRAVITY LINES.

19. ON ALL GRAVITY LINES, CONTRACTOR MUST START AT DOWNSTREAM END AND PROCEED UPSTREAM TAKING CARE TO EXPOSE ALL EXISTING UTILITIES AND STRUCTURES WHICH MAY CONFLICT WITH THE PROPOSED LINE. ANY OTHER SEQUENCE OF CONSTRUCTION WILL BE AT THE CONTRACTOR'S RISK.

20. CONTRACTOR TO COORDINATE LOCATION OF SIDEWALK AND ACCESSIBLE RAMPS WITHIN PUBLIC RIGHT OF WAY WITH INSPECTOR PRIOR TO BEGINNING CONSTRUCTION.

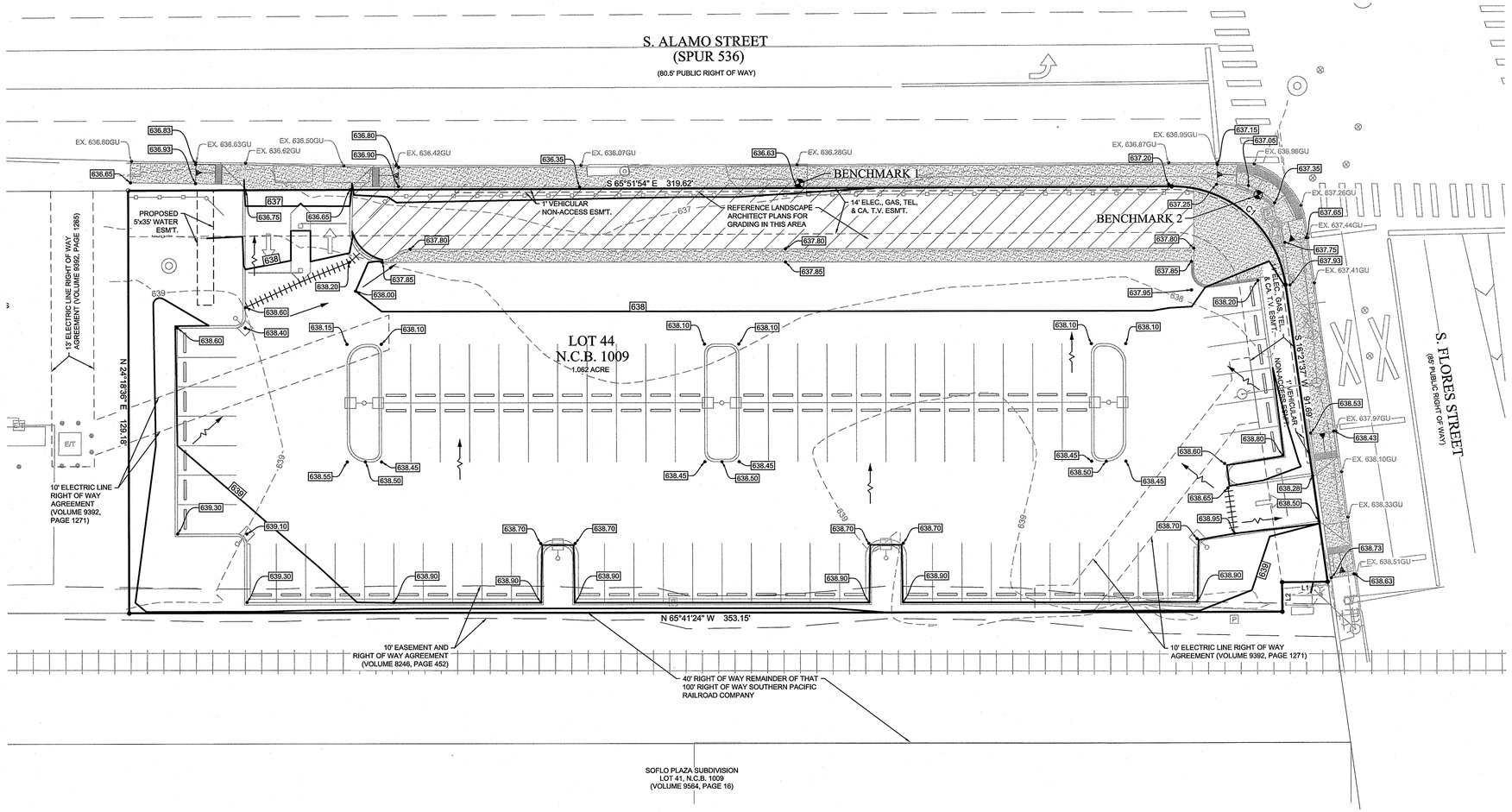
21. IN CASES WHERE HYDROMULCH HAS BEEN PROPERLY APPLIED, CONTRACTOR TO PROVIDE WATER AS REQUIRED TO ACHIEVE A MINIMUM OF 75% GERMINATION TOWARDS SUBSTANTIAL GROWTH.

22. PROPOSED SPOT ELEVATIONS AND CONTOURS REPRESENT FINISHED TOP OF PAVEMENT OR TOPSOIL.

23. ALL FILL SHALL BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 95% DENSITY UNLESS OTHERWISE NOTED.

24. ALL SIDEWALK CROSS SLOPES SHALL NOT EXCEED 2% SLOPE UNLESS OTHERWISE SPECIFIED.

25. PEDESTRIAN RAILING OR FENCING SHALL BE INSTALLED ALONG ALL RETAINING WALLS OR VERTICAL DROPS GREATER THAN 24". CONTRACTOR SHALL COORDINATE WITH OWNER AND/OR LANDSCAPE ARCHITECT FOR DESIGN AND SPECIFICATIONS. ANY RAILING REQUIRED CLOSER THAN 10' TO A DRIVE LANE OR PARKING SPACE MAY NEED TO BE A TRAFFIC BARRIER. CONTRACTOR TO COORDINATE WITH ENGINEER.



ISSUED FOR PERMIT
04-05-2016

mee ENGINEERS
1035 Central Parkway North
San Antonio, Texas 78232
(210) 545-1122
FAX (210) 545-0302
FIRM REGISTRATION NUMBER:
T.B.P.E. F-734 &
T.B.P.L.S. 10011700
JOB NO. 31336- 1269

GRADING PLAN

ENGINEER
STATE OF TEXAS
JUSTIN R. SHIPPEY
103767
LICENSED
PROFESSIONAL ENGINEER
2016.04.05

REVISIONS
1 SEE SHEET C1

DSD STAFF PARKING LOT

SAN ANTONIO, TEXAS

CITY OF SAN ANTONIO

project number
1538

date
03.09.16

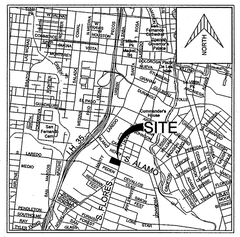
drawn by
RC

checked by
JRS

Beaty Palmer Architects, Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205
voice 210.212.8022
fax 210.212.8018
www.beatypalmer.com

sheet number
C3

BEATY PALMER ARCHITECTS



LOCATION MAP
NOT TO SCALE

NOTE

PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL LOCATE AND FIELD VERIFY ALL EXISTING UTILITIES INCLUDING, BUT NOT LIMITED TO, WATER LINES, GAS LINES, SEWER LINES AND ELECTRIC LINES.

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

NOTE

BACKFLOW PREVENTION DEVICES SHALL BE PROVIDED AS DEPICTED OR NOTED ON THE PLANS FOR FIRE LINES, IRRIGATION LINES AND IN SOME CASES DOMESTIC LINES. REFERENCE IRRIGATION PLANS AND THE MEP PLANS FOR ADDITIONAL INFORMATION CONCERNING THESE DEVICES. IN THE EVENT BACKFLOW PREVENTERS ARE NOT CLEARLY SHOWN, CONTRACTOR IS TO CONTACT THE ENGINEER AND REQUEST CLARIFICATION. ON MULTIFAMILY PROJECT BACKFLOW PREVENTION IS REQUIRED WITHIN THE BUILDINGS FOR THE FIRE SYSTEM.

NORTH

SCALE: 1" = 20'

20 0 10 20 40

UTILITY GENERAL NOTES:

1. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATION. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

2. ALL MATERIALS AND WORKMANSHIP INVOLVED WITH THE CONSTRUCTION OF THE WATER SERVICE(S), INTERIOR WATER LINES AND SANITARY SEWER LINES MUST BE IN STRICT ACCORDANCE WITH APPLICABLE PORTIONS OF THE INTERNATIONAL PLUMBING CODE (2015 EDITION) OR LATEST EDITION ADOPTED BY CITY OF SAN ANTONIO AND SAN ANTONIO WATER SYSTEM.

3. THIS SHEET IS TO BE USED FOR UTILITY CONSTRUCTION ONLY.

4. ALL EXISTING UTILITIES MAY NOT BE SHOWN ON THIS DRAWING, CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES (VERTICALLY AND HORIZONTALLY).

5. THE CONTRACTOR IS REQUIRED TO FURNISH AND INSTALL ALL NECESSARY FITTINGS AND APPURTENANCES REQUIRED TO COMPLETE THE INSTALLATION OF THE SYSTEMS AS SHOWN ON THE DRAWING.

6. CONNECTIONS TO WATER MAINS AND SERVICES, METERS AND METER VAULTS SHALL BE IN STRICT ACCORDANCE WITH CODES AND REGULATIONS.

7. SEE IRRIGATION PLAN FOR DETAILS CONCERNING IRRIGATION METER.

8. ALL WATER LINES TO BE INSTALLED A MINIMUM OF 12" ABOVE SANITARY LINES (MEASURED FROM BOTTOM OF WATER TO TOP OF SEWER).

9. ALL CLEANOUTS LOCATED IN VEHICULAR AREAS SHALL BE INSTALLED WITHIN A TRAFFIC BEARING BOX. THE BOX SHALL BE SET IN A CONCRETE SLAB EXTENDING 6" FROM THE BOX PERIMETER. SLAB TO BE 6" THICK WITH 2500 P.S.I. CONCRETE. SEE DETAIL SHEET.

10. WHEN SEWER LINES ARE INSTALLED IN THE VICINITY OF WATER MAINS, SUCH INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THE TCEQ REGULATION 30 TAC 217.53(d) OR ANY REVISION THERETO. (NO SEPARATE PAY ITEM).

11. TOPS OF CLEANOUTS SHALL BE SET TO MATCH FINISHED GRADE.

12. CONTRACTOR TO INSTALL THRUST BRACING FOR ALL WATER PIPE BENDS/FITTINGS. (3" AND GREATER DIAMETER)

13. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE MEP PLANS AND THE GRADING PLAN TO INSURE THAT UTILITY INSTALLATIONS DO NOT HAVE CONFLICTS WITH OTHER IMPROVEMENTS.

14. CONTRACTOR IS RESPONSIBLE FOR BOTH VERTICAL AND HORIZONTAL CONTROL.

15. THE CONTRACTOR SHALL DISPOSE OF ALL EXCESS MATERIAL OFF-SITE.

16. ALL DEBRIS AND OTHER OBJECTIONABLE MATERIALS SHALL BE DISPOSED OF OFF-SITE BY CONTRACTOR.

17. ALL SANITARY SEWERS ARE 6" PIPE WITH COMPRESSION JOINTS UNLESS OTHERWISE NOTED.

18. ALL WORK WITHIN PUBLIC RIGHT-OF-WAYS SHALL BE IN CONFORMANCE WITH APPLICABLE CODES AND SPECIFICATIONS.

19. ALL MATERIALS AND INSTALLATION ASSOCIATED WITH THE FIRE PROTECTION SYSTEM MUST COMPLY WITH REQUIREMENTS OF THE FIRE MARSHALL'S OFFICE AND N.F.P.A. #24. THIS INCLUDES REQUIRED INSPECTIONS. IF THE RESULTS OF ANY MEETINGS BETWEEN THE CONTRACTOR AND THE FIRE MARSHALL MAY AFFECT THE CONSTRUCTION THE CONTRACTOR MUST NOTIFY THE OWNER AND ENGINEER IMMEDIATELY (IN WRITING).

20. ALL WORK INVOLVING FIRE MAIN TO BE PERFORMED BY A STATE LICENSED SPRINKLER CONTRACTOR.

21. FIRE MAIN TO BE C900 P.V.C. AND LISTED BY UNDERWRITER LABORATORIES, INC. AS SUITABLE FOR FIRE PROTECTION USE.

22. FIRE MAIN TO HAVE 4' OF COVER AS MEASURED FROM TOP OF PIPE TO FINISHED PAVEMENT OR TOPSOIL.

23. THE FIRE MAIN TO BE FLUSHED AND TESTED IN ACCORDANCE WITH N.F.P.A. #24. PROVIDE THRUST BRACING AS REQUIRED.

24. THE FIRE MAIN CONNECTION TO THE PUBLIC WATER MAIN IS PART OF THIS CONTRACT. COORDINATE WITH SAN ANTONIO WATER SYSTEM.

25. LOCATION OF EXISTING UTILITIES, AS SHOWN ON THESE PLANS, IS BASED ON A COMBINATION OF FIELD SURVEYING AND AVAILABLE UTILITY MAPS. CONTRACTOR TO DETERMINE VERTICAL AND HORIZONTAL LOCATIONS OF ALL UTILITIES (WHETHER SHOWN ON PLANS OR NOT) BY COORDINATING WITH THE RESPECTIVE UTILITY AGENCIES PRIOR TO CONSTRUCTION. THE FOLLOWING ARE NUMBERS OF THE RESPECTIVE AGENCIES:

SAN ANTONIO WATER SYSTEM (WATER) 233-2009
SAN ANTONIO WATER SYSTEM (SEWER) 233-2009
CPS ENERGY (GAS & ELECTRIC) 978-3500
AT&T (TELEPHONE) 820-6229
TIME WARNER CABLE (TELEVISION) 675-4560
VALERO ENERGY CORP. 246-2394
TESS–STATEWIDE ONE CALL DAMAGE PREVENTION SYSTEM FOR BURIED UTILITIES. . . 1-800-DIG-TESS

IF ANY NUMBERS HAVE CHANGED OR ARE INCORRECT, THE CONTRACTOR IS STILL RESPONSIBLE FOR CONTACTING THE AGENCIES.

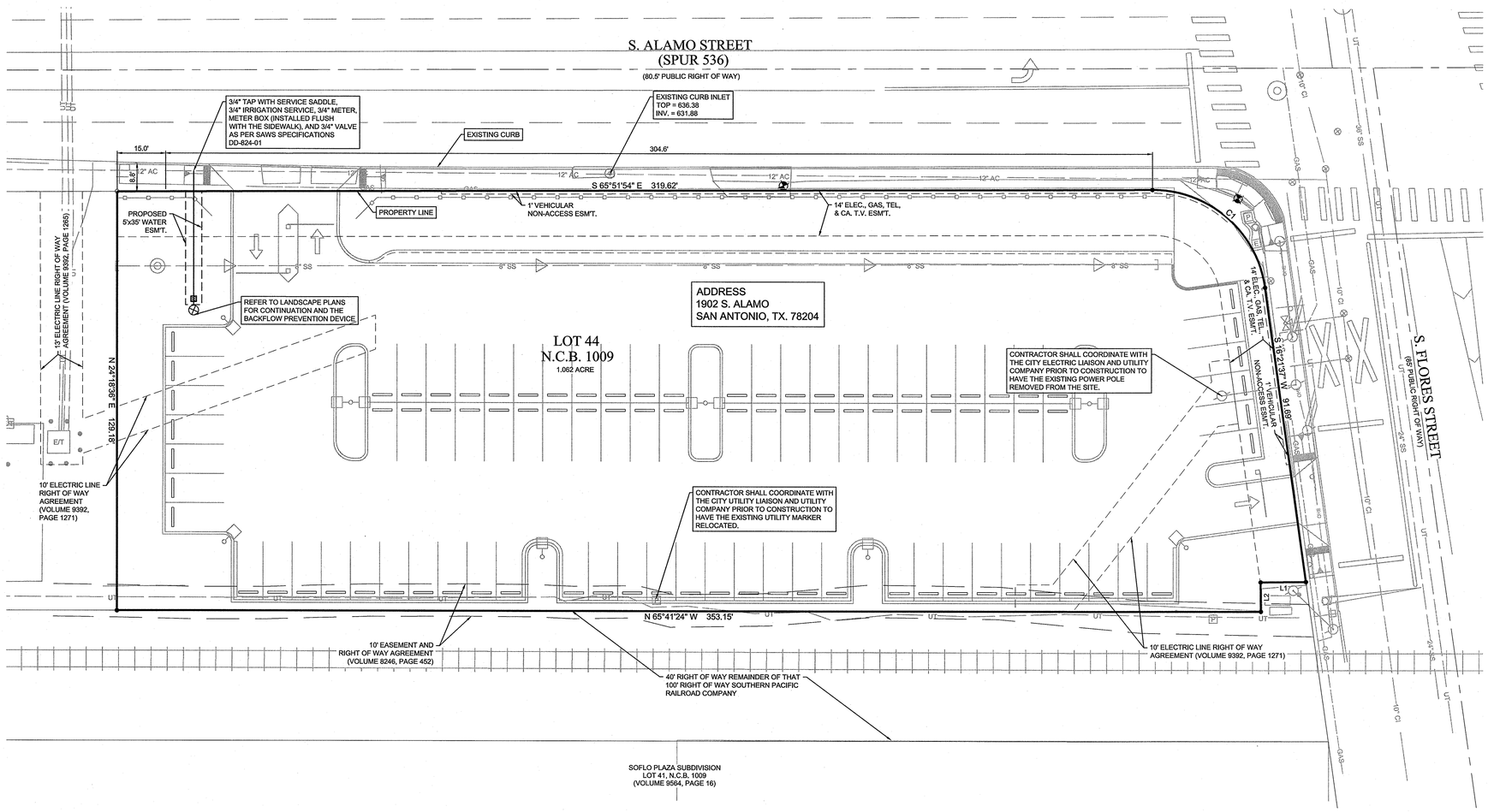
26. ON ALL GRAVITY LINES, CONTRACTOR MUST START AT DOWNSTREAM END AND PROCEED UPSTREAM TAKING CARE TO EXPOSE ALL EXISTING UTILITIES AND STRUCTURES WHICH MAY CONFLICT WITH THE PROPOSED LINE. ANY OTHER SEQUENCE OF CONSTRUCTION WILL BE AT THE CONTRACTOR'S RISK.

27. CONTRACTOR TO APPLY FOR WATER METER PERMITS AND COORDINATE PAYMENT OF APPLICABLE IMPACT FEES AT THE START OF CONSTRUCTION. CONTRACTOR TO INSTALL WATER METERS AND MAKE APPROPRIATE MAIN CONNECTIONS AS EARLY AS POSSIBLE IN THE WATER SYSTEM INSTALLATION PROCESS. REPORT CONFLICTS TO THE ENGINEER AND OWNER AS THESE ARE DISCOVERED SO THAT ADJUSTMENTS TO THE PLANS CAN BE MADE.

28. CONTRACTOR TO PLAN UTILITY LINE INSTALLATIONS IN A MANNER TO AVOID CONFLICTS WITH PROPOSED GRAVITY LINES.

29. CONTRACTOR SHALL EXPOSE ALL EXISTING UTILITIES CROSSING PROPOSED GRAVITY LINES AND INSURE THERE WILL BE NO CONFLICTS PRIOR TO BEGINNING CONSTRUCTION. ADDITIONALLY, CONTRACTOR TO PLAN UTILITY LINE INSTALLATIONS IN A MANNER TO AVOID CONFLICTS WITH PROPOSED GRAVITY LINES.

30. ON ALL GRAVITY LINES, CONTRACTOR MUST START AT DOWNSTREAM END AND PROCEED UPSTREAM TAKING CARE TO EXPOSE ALL EXISTING UTILITIES AND STRUCTURES WHICH MAY CONFLICT WITH THE PROPOSED LINE. ANY OTHER SEQUENCE OF CONSTRUCTION WILL BE AT THE CONTRACTOR'S RISK.



LEGEND

SD	EXISTING STORM DRAIN
SS	EXISTING SANITARY SEWER LINE
W	EXISTING WATER LINE
G	EXISTING GAS LINE
OT	EXISTING OVERHEAD TELEPHONE
UT	EXISTING UNDERGROUND TELEPHONE
OHE	EXISTING OVERHEAD ELECTRIC
UE	EXISTING UNDERGROUND ELECTRIC
DW	PROPOSED DOMESTIC WATER LINE
W	PROPOSED WATER LINE
I	PROPOSED IRRIGATION LINE
SS	PROPOSED SANITARY SEWER LINE
SD	PROPOSED STORM DRAIN
G	PROPOSED GAS LINE
F	PROPOSED FIRE LINE
	THRUST BLOCKING
E	EXISTING ELECTRIC METER
	EXISTING CLEAN-OUT
	EXISTING WATER VALVE
W	EXISTING WATER METER
W	PROPOSED WATER METER
	EXISTING FIRE HYDRANT
	PROPOSED FIRE HYDRANT
	PROPOSED FIRE DEPARTMENT CONNECTION
	PROPOSED REMOTE FIRE DEPARTMENT CONNECTION
	EXISTING LIGHT POLE
	EXISTING POWER POLE
	EXISTING MANHOLE
	PROPOSED MANHOLE
	EXISTING GRATE
TL	EXISTING TRAFFIC LIGHT
G	EXISTING GAS VALVE
T	EXISTING TELEPHONE MANHOLE
	EXISTING ANCHOR

ISSUED FOR PERMIT
04-05-2016

mbe ENGINEERS
1035 Central Parkway North
San Antonio, Texas 78232
(210) 545-9191
FAX (210) 545-9362
FIRM REGISTRATION NUMBER:
T.B.P.E. F-784 &
T.B.P.L.S. 10011700
JOB NO. 31336- 1269

UTILITY PLAN

ENGINEER

STATE OF TEXAS
JUSTIN R. SHIPPEY
103767
LICENSED
PROFESSIONAL ENGINEER

2016 04 05

REVISIONS

1 SEE SHEET C1

DSD STAFF PARKING LOT

SAN ANTONIO, TEXAS

CITY OF SAN ANTONIO

project number
1538

date
03.09.16

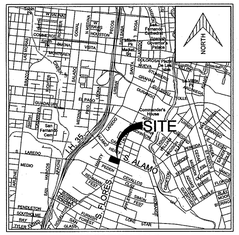
drawn by
RC

checked by
JRS

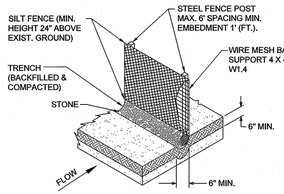
Beaty Palmer Architects, Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205
voice 210.212.8022
fax 210.212.8018
www.beatypalmer.com

sheet number
C4

BEATY PALMER ARCHITECTS



LOCATION MAP
NOT TO SCALE



TYPICAL SILT FENCE DETAIL

NOT TO SCALE

GENERAL EROSION CONTROL NOTES

1. TEMPORARY EROSION AND SEDIMENTATION CONTROLS: AS DICTATED BY THE T.C.E.Q. WHILE CONSTRUCTION IS IN PROGRESS, THE CONTRACTOR SHALL ENDEAVOR TO IMPEDE THE TRANSMISSION OFF THE CONSTRUCTION SITE OF ERODED TOPSOIL AND SHALL AVOID POLLUTION OF TOPSOIL/RUNOFF DUE TO FUELING OR SERVICING OF EQUIPMENT OR IMPROPER MATERIALS.

2. EXCAVATED MATERIAL NOT USED FOR STREET FILL ON-SITE SHALL NOT BE STOCKPILED INDEFINITELY ON-SITE, BUT SHALL BE PROMPTLY TRANSPORTED OFF THE SITE. A SILT FENCE SHALL BE INSTALLED DOWN- SLOPE OF ANY PLACED FILL TO INHIBIT EROSION OF THE FILL MATERIAL.

3. THE DEVELOPER WILL SEED CLEARED STREET PARKWAYS WITH BERMUDA GRASS OR SOME OTHER FORM OF HARDY GRASSPLANTS AS SOON AS POSSIBLE AFTER STREET AND UTILITY CONSTRUCTION IS COMPLETED.

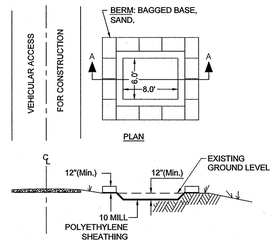
4. THE SILT FENCING AND ROCK BERM SHOWN HERE-ON IS DESIGNED TO INTERCEPT SILT-CARRYING RUNOFF ON A UNIT-BY-UNIT BASIS AND INHIBIT ITS BEING CARRIED OUTSIDE THE BOUNDARIES OF THE UNIT AND THE DEVELOPMENT TO DOWNGRADE FEATURES. IT IS OUR INTENTION AND ANY CONTRACTOR'S DIRECTION TO INSTALL SILT FENCES AND ROCK BERM AS SHOWN PRIOR TO ANY EXCAVATION OR TRENCHING WITHIN A DELINEATED UNIT.

5. REFERENCE POLLUTION PREVENTION PLAN AND WATER POLLUTION ABATEMENT PLAN FOR ADDITIONAL INFORMATION AND REQUIREMENTS. 6. LOCATION OF SILT FENCE AND ROCK BERM IS APPROXIMATE. CONTRACTOR TO DETERMINE EXACT LOCATION BASED ON WORK TO BE PERFORMED UNDER THIS CONTRACT AND WORK TO BE PERFORMED BY VARIOUS AGENCIES INVOLVED WITH THIS PROJECT.

7. THIS SHEET IS TO BE USED FOR EROSION CONTROL PURPOSES ONLY.

8. LOCATION OF STABILIZED CONSTRUCTION ENTRANCE IS TO BE AS SHOWN ON THIS PLAN UNLESS CONTRACTOR RECEIVES PRIOR WRITTEN APPROVAL FROM THE ENGINEER.

9. CONTRACTOR TO INSTALL ROCK GABION IN LOCATIONS WHERE SIGNIFICANT CONCENTRATED STORM WATER DISCHARGE OCCURS TOWARDS AN ERODABLE AREA.



CONCRETE TRUCK WASHOUT PIT

NOT TO SCALE

WASHOUT PIT GENERAL NOTES:

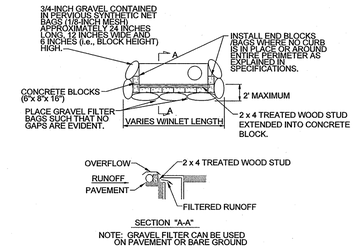
DETAILS ILLUSTRATE MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.

IF HAY BALES ARE USED FOR BERM, THEY SHALL BE ANCHORED IN PLACE WITH 2 REBARS PER BALE, DRIVEN INTO GROUND ENOUGH TO PROVIDE REASONABLE STABILITY.

WASHOUT PIT SHALL BE LOCATED IN AN AREA EASILY ACCESSIBLE TO CONSTRUCTION TRAFFIC.

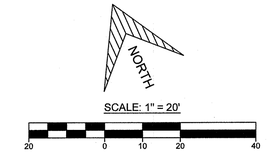
WASHOUT PIT SHALL NOT BE LOCATED IN AREA SUBJECT TO INUNDATION FROM STORM WATER RUNOFF.

PIT SHALL NOT BE LOCATED OVER OR IN THE IMMEDIATE VICINITY OF A FEATURE OF GROUNDWATER RECHARGE.



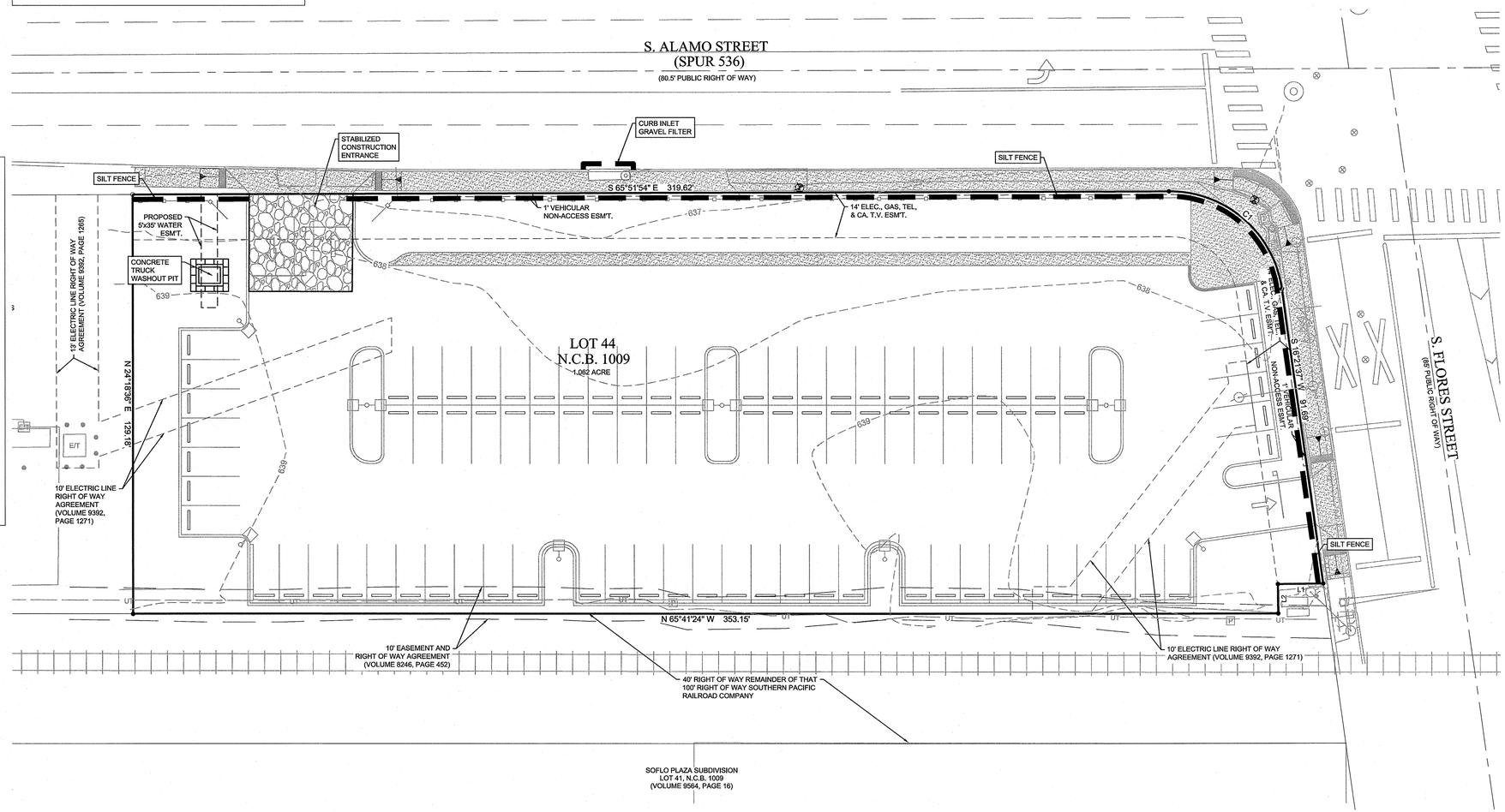
CURB INLET GRAVEL FILTER

NOT TO SCALE



LEGEND

- SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- CONCRETE TRUCK WASHOUT PIT
- GRATE & CURB INLET PROTECTION
- FIBER ROLL BERM
- ROCK BERM
- 780 — EXISTING CONTOUR
- 100 — PROPOSED CONTOUR (REPRESENT FINISHED TOP OF PAVEMENT OR TOPSOIL)
- DEFINED SWALE
- PROPOSED RETAINING WALL
- PROPOSED SAWTOOTH CURB
- PROPOSED RIDGE
- FF=000.00 — PROPOSED FIN. FLOOR ELEVATION
- PROPOSED FOUNDATION BREAKS
- OVERLAND FLOW DIRECTION
- GRATE



SILT FENCE NOTES:

1. STEEL POSTS, WHICH SUPPORT THE SILT FENCE, SHOULD BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 1-FOOT DEEP.

2. LAY OUT FENCING DOWN-SLOPE OF DISTURBED AREA. FOLLOWING THE CONTOUR AS CLOSELY AS POSSIBLE. THE FENCE SHOULD BE SITED SO THAT THE MAXIMUM DRAINAGE AREA IS 1/4 ACRE/100 FEET OF FENCE.

3. THE TOE OF THE SILT FENCE SHOULD BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWN-SLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G., PAVEMENT OR ROCK OUTCROP), WEIGHT FABRIC FLAP WITH 3 INCHES OF PEA GRAVEL ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.

4. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.

5. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHOULD BE A 3-FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.

6. INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY, AS NEEDED.

7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

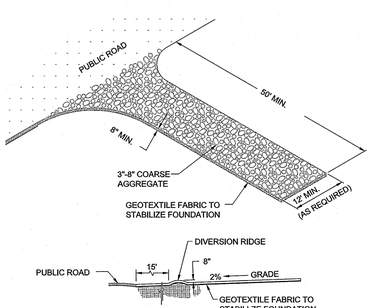
8. REPLACE ANY TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION.

9. REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY. IF A SECTION OF FENCE IS OBSTRUCTING VEHICULAR ACCESS, CONSIDER RELOCATING IT TO A SPOT WHERE IT WILL PROVIDE EQUAL PROTECTION, BUT WILL NOT OBSTRUCT VEHICLES. A TRIANGULAR FILTER DIKE MAY BE PREFERABLE TO A SILT FENCE AT COMMON VEHICLE ACCESS POINTS.

10. WHEN CONSTRUCTION IS COMPLETE, THE SEDIMENT SHOULD BE DISPOSED OF IN A MANNER THAT WILL NOT CAUSE ADDITIONAL SILTATION AND THE PRIOR LOCATION OF THE SILT FENCE SHOULD BE REVEGETATED. THE FENCE ITSELF SHOULD BE DISPOSED OF IN A APPROVED LANDFILL.

11. DESIGNATED SILT FENCE CONSIST OF THE FOLLOWING: GEOTECHNICAL FILTER FABRIC, STRETCHED AND SECURED TO THREE FOOT HIGH WIRE FENCING AND SUPPORTED BY STEEL POSTS AT A MAXIMUM SPACING OF 6 FEET. THE BOTTOM 6 INCHES OF FABRIC SHALL BE BURRIED.

12. MAINTENANCE AND INSPECTIONS SHALL BE AS DESIGNATED IN THE STORM WATER POLLUTION PREVENTION PLAN.



STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

STABILIZED CONSTRUCTION ENTRANCE (S. C. E.)
INSTALLATION of CONSTRUCTION ENTRANCE:

1. CLEAR THE AREA OF DEBRIS, ROCKS, OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.

2. GRADE THE AREA FOR THE ENTRANCE TO FLOW BACK ON TO THE CONSTRUCTION SITE. RUNOFF FROM THE S.C.E. ONTO A PUBLIC STREET WILL NOT BE ACCEPTED.

3. PLACE ROCK AS REQUIRED. (4"-8" OPEN GRADED CLEAN CRUSHED STONE)

4. SIDE CONTAINMENT, AT THE CONTRACTOR'S DISCRETION, IS SUGGESTED. THE SPECIFIED 8" THICKNESS OF CRUSHED STONE MUST BE MAINTAINED.

THIS SHEET TO BE USED FOR EROSION CONTROL PURPOSES ONLY.

ISSUED FOR PERMIT
04-05-2016

mbc ENGINEERS
1035 Central Parkway North
San Antonio, Texas 78232
(210) 545-1122
FAX (210) 545-9762
FIRM REGISTRATION NUMBER:
T.B.P.E. F-784 &
T.B.P.L.S. 10011700
JOB NO. 31336- 1269

ENGINEER
STATE OF TEXAS
JUSTIN R. SHIPPEY
103767
LICENSED
PROFESSIONAL ENGINEER
2016.04.05

REVISIONS

EROSION CONTROL PLAN

CITY OF SAN ANTONIO

DSD STAFF PARKING LOT

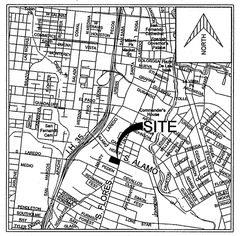
SAN ANTONIO, TEXAS

project number 1538
date 03.09.16
drawn by RC
checked by JRS

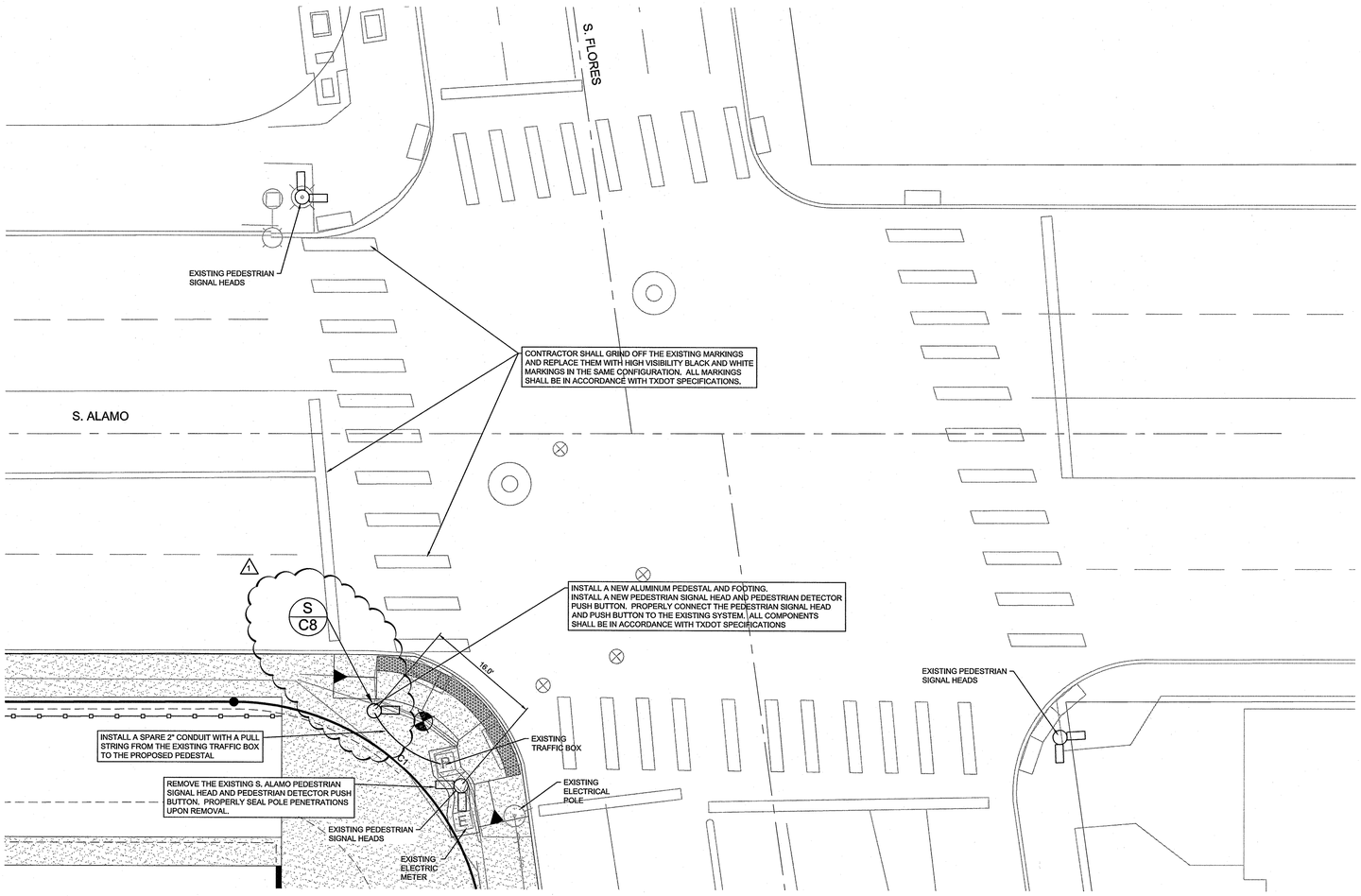
Beaty Palmer Architects, Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205
voice 210.212.8022
fax 210.212.8018
www.beatypalmer.com

sheet number
C5

BEATY PALMER ARCHITECTS



LOCATION MAP
NOT TO SCALE



SCALE: 1" = 10'

10 0 5 10 20

LEGEND

- PROPOSED CONCRETE HEADER CURB
- PROPOSED CONCRETE CURB
- EXISTING CONCRETE CURB
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- PROPOSED FIRE DEPARTMENT CONNECTION
- PROPOSED REMOTE FIRE DEPARTMENT CONNECTION
- MISC. TRAFFIC SIGN
- GUARD POST
- EXISTING WATER VALVE
- PROPOSED WATER VALVE
- LIGHT POLE
- POWER POLE
- EXISTING MANHOLE
- PROPOSED MANHOLE
- GRATE
- TRAFFIC LIGHT
- GUY WIRE ANCHOR
- ACCESSIBLE PARKING
- DETAIL REFERENCE — DETAIL / SHEET NUMBER
- EXISTING CONCRETE AREAS
- WHEELSTOP
- EXISTING FENCE
- PROPOSED FENCE
- OHE — EXISTING OVERHEAD ELECTRIC
- RETAINING WALL (REF. STRUCTURAL DWGS)
- SAWTOOTH CURB
- SINGLE LAMP LIGHT POLE
- DOUBLE LAMP LIGHT POLE

NOTE: THE CONTRACTOR SHALL INCLUDE IN THE BID THE TRAFFIC AND PEDESTRIAN CONTROL PLANS, DESIGN, AND THE IMPLEMENTATION OF TRAFFIC AND PEDESTRIAN CONTROL DEVICES AS REQUIRED FOR CONSTRUCTION.

ISSUED FOR PERMIT
04-05-2016

mbe ENGINEERS
1035 Central Parkway North
San Antonio, Texas 78232
(210) 549-1122
FAX (210) 545-9302
FIRM REGISTRATION NUMBER:
TBPE F-2018
T.B.P.L.S. 10011700

JOB NO. 31336- 1269

ENHANCED CROSSWALK PLAN

ENGINEER

STATE OF TEXAS
JUSTIN R. SHIPPEY
103767
LICENSED
PROFESSIONAL ENGINEER

2016 04 05

REVISIONS

1 SEE SHEET C1

DSD STAFF PARKING LOT

SAN ANTONIO, TEXAS

CITY OF SAN ANTONIO

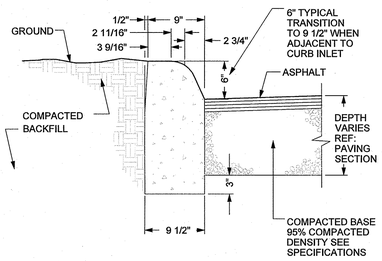
project number 1538	drawn by RC
date 03.09.16	checked by JRS

Beaty Palmer Architects, Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205
voice 210.212.8022
fax 210.212.8018
www.beatypalmer.com

sheet number

C6

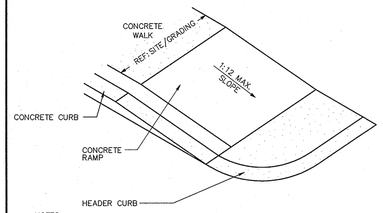
BEATY PALMER ARCHITECTS



NOTE:
BACKFILL TO BE PLACED FLUSH WITH TOP OF CURB

A TYPICAL 6" CURB DETAIL ADJACENT TO GROUND

N.T.S

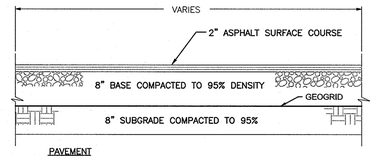


NOTES:

1.) CONSTRUCT DETECTABLE MARKINGS IN ACCORDANCE WITH A.D.A. REQUIREMENTS
2.) RAMP TO HAVE LIGHT REFLECTIVE VALUE TO CONTRAST W/ADJACENT CONCRETE

D ACCESSIBLE RAMP DETAIL

N.T.S



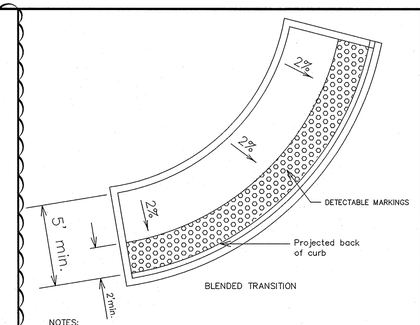
PAVEMENT

–ASPHALT–2" H.M.A.C. TYPE C (IN ACCORDANCE WITH COSA ITEM 205)
–BASE–6" BASE COURSE (IN ACCORDANCE WITH COSA ITEM 200, TYPE A, GRADE 1 BASE)
–SUBGRADE– 8" COMPACTED TO 95% OF DRY DENSITY USING TEX–114–E AT A WATER CONTENT BETWEEN 0 & 4% ABOVE OPTIMUM MOISTURE CONTENT. PROOF ROLL IN ACCORDANCE WITH TxDOT ITEM 216.
–GEOGRID– THE GEOGRID SHOULD CONSIST OF BX TYPE 1. THE GEOGRID SHALL BE PLACED BETWEEN THE COMPACTED SUBGRADE AND THE CRUSHED LIMESTONE BASE MATERIAL (CLBM). INSTALL GEOGRID IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS. THE GEOGRID SHALL HAVE A MINIMUM OVERLAP OF 2 FEET OR AS RECOMMENDED BY THE MANUFACTURER, WHICHEVER IS GREATER.

REFERENCE FUGRO GEOTECHNICAL REPORT NO. 04.36161002 DATED MARCH 4, 2016 AND ADDENDUMS FOR ADDITIONAL DETAILS

G ASPHALT PAVEMENT (ADD ALTERNATE 1)

N.T.S

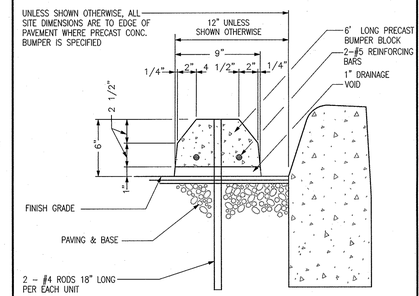


NOTES:

1.) CONSTRUCT DETECTABLE MARKINGS IN ACCORDANCE WITH A.D.A. REQUIREMENTS
2.) RAMP TO HAVE LIGHT REFLECTIVE VALUE TO CONTRAST W/ADJACENT CONCRETE
3.) RAMP SHALL BE IN ACCORDANCE WITH TxDOT AND CITY OF SAN ANTONIO SPECIFICATIONS.

N TYPE 5 TXDOT SIDEWALK RAMP DETAIL

N.T.S

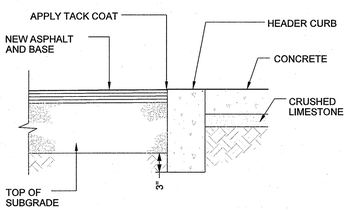


M PRECAST WHEEL STOP DETAIL

N.T.S

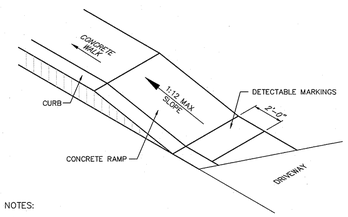
P

N.T.S



B HEADER CURB DETAIL

N.T.S



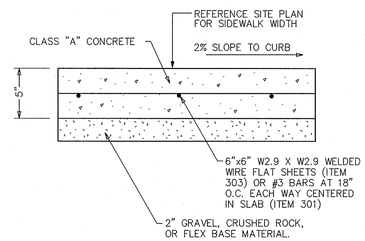
NOTES:

1.) CONSTRUCT DETECTABLE MARKINGS IN ACCORDANCE WITH A.D.A. REQUIREMENTS
2.) RAMP TO HAVE LIGHT REFLECTIVE VALUE TO CONTRAST W/ADJACENT CONCRETE
3.) RAMP SHALL BE IN ACCORDANCE WITH TxDOT (SOUTH ALAMO) AND CITY OF SAN ANTONIO (SOUTH FLORES) SPECIFICATIONS.

E ACCESSIBLE RAMP DETAIL

N.T.S

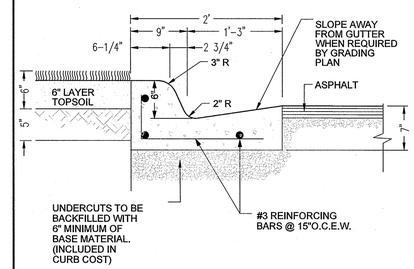
1



H TYPICAL SIDEWALK DETAIL

N.T.S

NOTE:
1. CONSTRUCT " EXPANSION JOINT AT 40' O.C.
2. CONSTRUCT CONTROL JOINT AT 10' O.C.

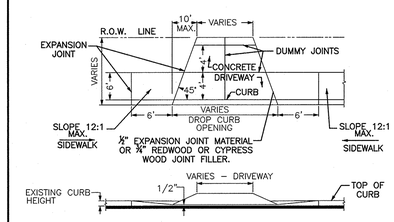


NOTE:
TOP SOIL LAYER TO BE FLUSH WITH TOP OF CURB

K CURB AND GUTTER DETAIL

N.T.S

NOTE: DUMMY JOINTS TO BE PLACED EVERY 4' BEGINNING AT THE BACK OF CURB & ONE DUMMY JOINT RUNNING DOWN THE MIDDLE AS SHOWN

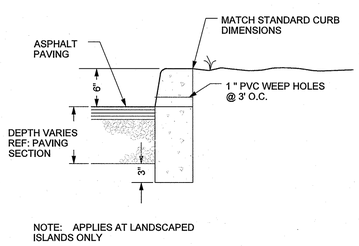


N TYPICAL DRIVEWAY DETAILS

N.T.S

Q

N.T.S

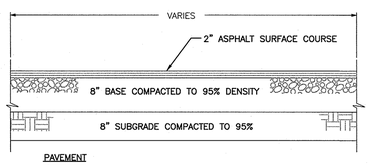


NOTE: APPLIES AT LANDSCAPED ISLANDS ONLY

NOTE:
BACKFILL TO BE PLACED FLUSH WITH TOP OF CURB

C TYPICAL 6" CURB DETAIL ADJACENT TO ISLAND

N.T.S



PAVEMENT

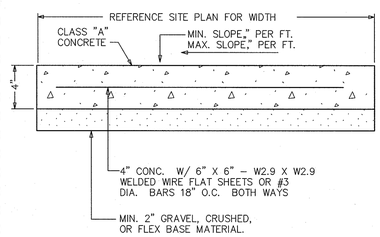
–ASPHALT–2" H.M.A.C. TYPE C (IN ACCORDANCE WITH COSA ITEM 205)
–BASE–8" BASE COURSE (IN ACCORDANCE WITH COSA ITEM 200, TYPE A, GRADE 1 BASE)
–SUBGRADE– 8" COMPACTED TO 95% OF DRY DENSITY USING TEX–114–E AT A WATER CONTENT BETWEEN 0 & 4% ABOVE OPTIMUM MOISTURE CONTENT. PROOF ROLL IN ACCORDANCE WITH TxDOT ITEM 216.

REFERENCE FUGRO GEOTECHNICAL REPORT NO. 04.36161002 DATED MARCH 4, 2016 AND ADDENDUMS FOR ADDITIONAL DETAILS

NOTE: REFER TO DETAIL G–C7 FOR ADD ALTERNATE 1.

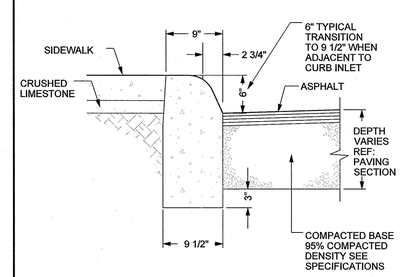
F ASPHALT PAVEMENT

N.T.S



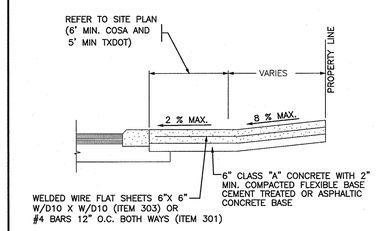
I TYPICAL SIDEWALK DETAIL PUBLIC RIGHT-OF-WAY

N.T.S



L TYPICAL 6" CURB DETAIL ADJACENT TO SIDEWALK

N.T.S



REFERENCE: C.O.S.A. AND TxDOT STANDARD SPECIFICATION ALSO REFERENCE DETAIL N–C7 FOR PLAN VIEW DETAILS

O CONCRETE APRON

N.T.S

R

N.T.S

1

ISSUED FOR PERMIT
04-05-2016

mbe ENGINEERS
1035 Central Parkway North
San Antonio, Texas 78232
(210) 545-1122
FAX (210) 545-9202
FIRM REGISTRATION NUMBER:
T.B.P.E. F-7084
T.B.P.L.S. 10011700
JOB NO. 31336- 1269

SITE DETAILS

ENGINEER

STATE OF TEXAS
JUSTIN R. SHIPPEY
103767
LICENSED PROFESSIONAL ENGINEER
2016-04-05

REVISIONS

1 SEE SHEET C1

DSD STAFF PARKING LOT

SAN ANTONIO, TEXAS

CITY OF SAN ANTONIO

project number
1538

date
03.09.16

drawn by
RC

checked by
JRS

Beaty Palmer Architects, Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205
voice 210.212.8022
fax 210.212.8018
www.beatypalmer.com

sheet number

C7

BEATY PALMER ARCHITECTS

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is assumed by the Texas Department of Transportation for any purpose whatsoever. Persons who use or rely on this standard do so at their own risk and assume all liability arising from such use.

FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL: VERT BARS	REINFORCING STEEL: SPIRAL & PITCH	EMBEDDED DRILLED SHAFT LENGTH-ft (4), (5), (6): TEXAS CONE PENETROMETER N blows/ft: 10	15	40	ANCHOR BOLT DESIGN (1): ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	FOUNDATION DESIGN LOAD (2): MOMENT K-ft	SHEAR Kips	TYPICAL APPLICATION
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

1. Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
2. Foundation Design Loads are the allowable moments and shears at the base of the structure.
3. Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
4. Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.
5. If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.
6. Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

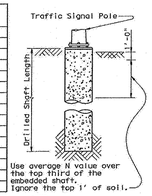
FOUNDATION SUMMARY TABLE (3)

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH (4) (FEET): 24-A	30-A	36-A	36-B	42-A
TOTAL DRILLED SHAFT LENGTHS								

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 24'			
		32' X 24'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' X24'	40' X 36'
					44' X 36'

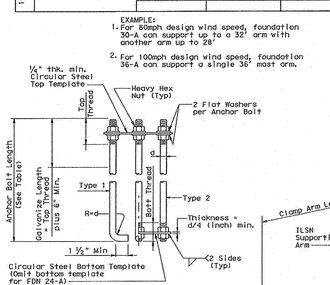
EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



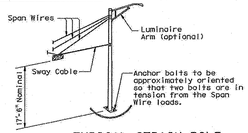
ANCHOR BOLT & TEMPLATE SIZES

BOLT DIA IN.	(7) BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	Rz	Rr
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅜"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ½"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

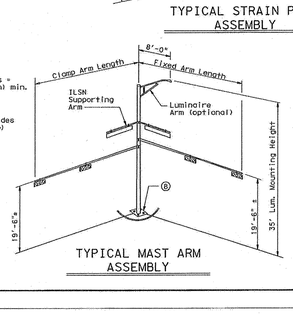
(7) Min dimensions given, longer bolts are acceptable.



ANCHOR BOLT ASSEMBLY

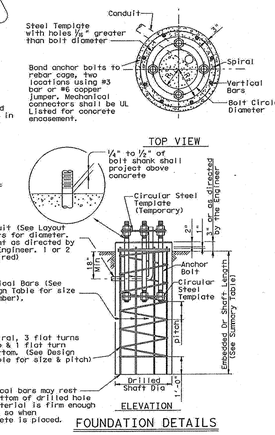


TYPICAL STRAIN POLE ASSEMBLY



(B) Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.

TYPICAL MAST ARM ASSEMBLY



FOUNDATION DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

Texas Department of Transportation
Traffic Operations Division

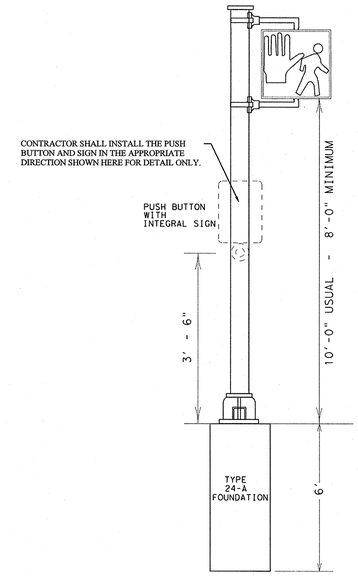
TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

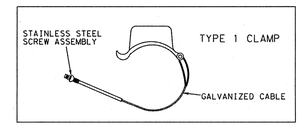
©TxDOT August 1995	DN: KS	CK: JSF	DW: WADHAM	CK: JSF/TEP
REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST		COUNTY	SHEET NO.

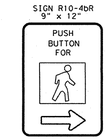
128

DATE:
FILE:

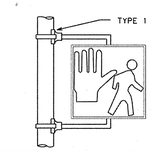


PEDESTAL POLE

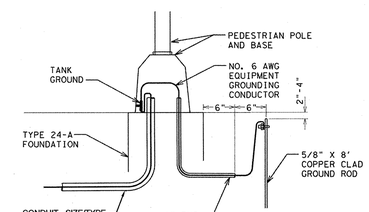




PEDESTRIAN PUSHBUTTON SIGN DETAILS



PEDESTRIAN SIGNAL HEAD MOUNTING FOR ONE PEDESTRIAN SIGNAL HEAD



PEDESTRIAN PUSH BUTTON POLE GROUNDING DETAILS

S
C8

PEDESTRIAN SIGNAL HEAD DETAILS

ISSUED FOR PERMIT
04-05-2016

mbc ENGINEERS
1035 Central Parkway North
San Antonio, Texas 78232
(210) 545-1122
FAX (210) 545-9302
FIRM REGISTRATION NUMBER:
T.B.P.E. F-784 &
T.B.P.L.S. 10011700
JOB NO. 31336- 1269

SITE DETAILS

ENGINEER
STATE OF TEXAS
JUSTIN R. SHIPPEY
103767
LICENSED PROFESSIONAL ENGINEER
20160405

REVISIONS
1 SEE SHEET C1

CITY OF SAN ANTONIO

DSD STAFF PARKING LOT
SAN ANTONIO, TEXAS

project number 1538
date 03.09.16
drawn by RC
checked by JRS

Beaty Palmer Architects, Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205
voice 210.212.8022
fax 210.212.8018
www.beatypalmer.com

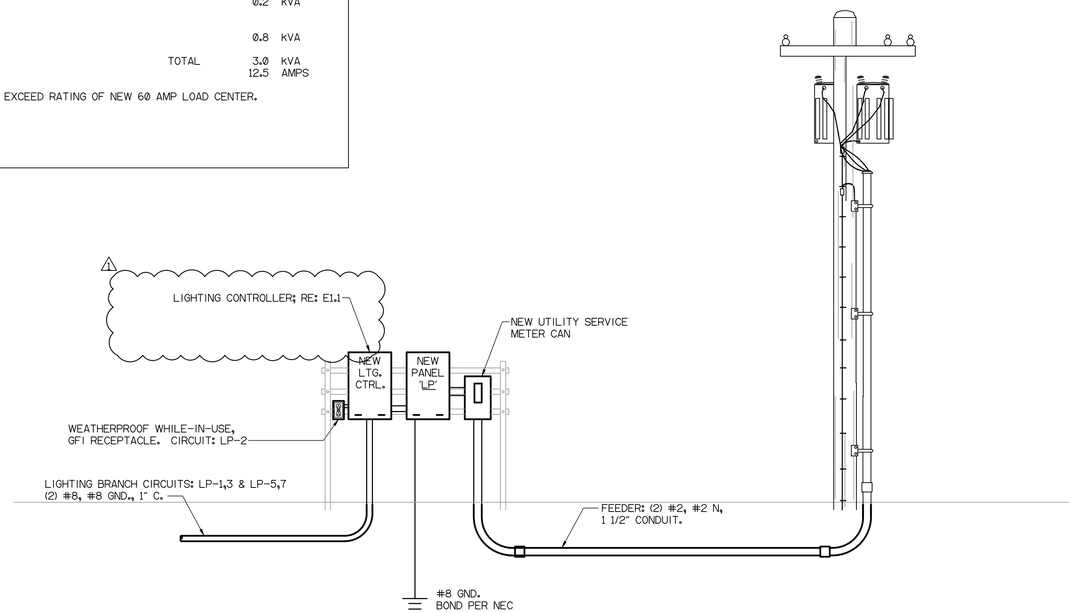
sheet number
C8

BEATY PALMER ARCHITECTS

LOAD ANALYSIS

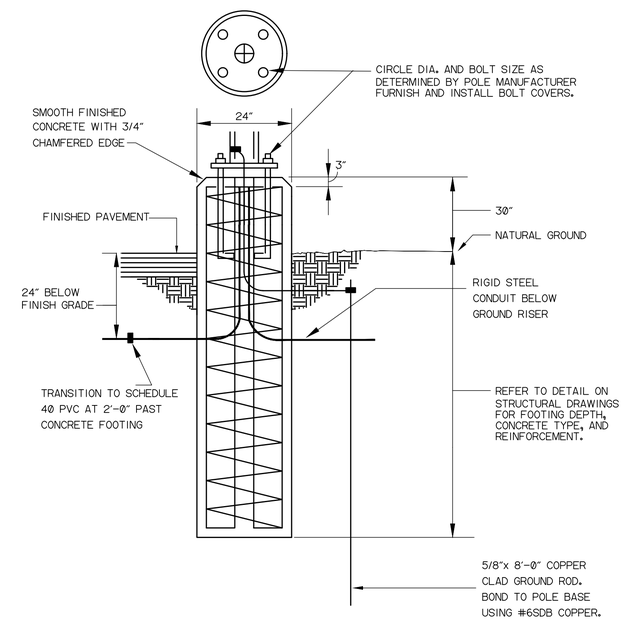
LIGHTING		
1.6 kVA AT 125%	2.0	kVA
RECEPTACLES		
	0.2	kVA
EQUIPMENT		
	0.8	kVA
TOTAL	3.0	kVA
	12.5	AMPS

TOTAL LOADS DO NOT EXCEED RATING OF NEW 60 AMP LOAD CENTER.



1 ELECTRICAL RISER DIAGRAM

NOT TO SCALE



2 POLE FOOTING DETAIL

NOT TO SCALE

LIGHT FIXTURE SCHEDULE

Type	Description	Ballast	Lamp Type	Lamp Qty.	Lamp Color	Lamp Lumen	Volts	Mounting	Manuf.	Catalog Number	Notes
P1	POLE MOUNTED SINGLE HEAD AREA LED LUMINARE, WITH BACK LIGHT CONTROL, ON 18-FOOT SQUARE STEEL POLE. COORDINATE FINISH WITH ARCHITECT.	ELECTRONIC	LED	1	4000K	15300	240	POLE RE: 2/E2.1	SPAULDING LIGHTING	CL1-A-60L-3-4K-4-BC	
P2	POLE MOUNTED DOUBLE HEAD AREA LUMINARES ON 18-FOOT SQUARE STEEL POLE. COORDINATE FINISH WITH ARCHITECT.	ELECTRONIC	LED	2	4000K	15300	240	POLE RE: 2/E2.1	SPAULDING LIGHTING	CL1-A-60L-3-4K-4	

PANEL LP

PROJECT:	CoSA DSD Parking Lot	ENCLOSURE:	NEMA 3R	CODES:	0=RCPT 1=EQPT 2=LTG 3=A/C 4=HTG 5=LGST MTR
PROJECT #:	52580.00	VOLTAGE:	240/120V., 1Ph., 3W	BREAKER MTG.:	BOLT-ON
LOCATION:		BUSSING:	100 A., 10 KAIC	ACCESSORIES:	GROUND BUSS
MOUNTING:		MAINS:	60 A. MCB	DATE:	4/5/2016

CODE	BRKR	CIRCUIT USE	CKT		LOAD	LOAD	CKT		CIRCUIT USE	BRKR	CODE
2	20/2	POLE LIGHTS (PERIMETER)	1	A	405	180	A	2	RECEPTACLE	20/1	0
2	---	-----	3	B	405	200	B	4	VEHICULAR BARRIER ARM	20/1	1
2	20/2	POLE LIGHTS (INTERIOR)	5	A	405	200	A	6	VEHICULAR BARRIER ARM	20/1	1
2	---	-----	7	B	405	200	B	8	VEHICULAR BARRIER ARM	20/1	1
	20/1	SPARE	9	A		200	A	10	IRRIGATION CONTROLLER	20/1	1
	20/1	SPARE	11	B			B	12	SPARE	20/1	

	FTL VA	LTG VA	RCPT VA	EQPT VA	CONN VA	CONN A	PNL VA	PNL A	DIST VA	DIST A
PHASE A	-	810	180	400	1,390	12	1,593	13	1,503	13
PHASE B	-	810	-	400	1,210	10	1,413	12	1,413	12
TOTAL	-	1,620	180	800	2,600	N/A	3,005	N/A	2,915	N/A

MS2 CONSULTING ENGINEERS
8200 IH-10 West, Suite 312
San Antonio, Texas 78230
Ph: 210 736-4265 Fx: 210 462-4907
Texas Registration No. F-465

revisions

1 4/5/2016 Addendum 01

engineer

4/05/2016

STATE OF TEXAS
RYAN A. ROYAL
94773
LICENSED PROFESSIONAL ENGINEER

DSD Staff Parking Lot

1902 S. Alamo Street
San Antonio, Texas 78204

project number
1538

date

drawn by
RAR

checked by
RAR

Beaty Palmer Architects, Inc.
110 Broadway, Suite 600
San Antonio, Texas 78205
voice 210.212.8022
fax 210.212.8018
www.beatypalmer.com

sheet number

E2.1

CITY OF SAN ANTONIO

BEATY PALMER ARCHITECTS

CITY OF SAN ANTONIO

Project Name: DSD Staff Parking Lot **Date Issued: April 5, 2016**
ID NO.: 23-01456

The estimated construction budget for this contract is $570,000

020
BID FORM

_____
Legal Name of Company (print)

I. BASE BID

Total Amount of Base Bid (Insert Amount in Words and Numbers):

_____ **$** _____

II. ALTERNATES

Amount of each Alternates (if applicable) insert in Numbers:

Additive Alternate #1 - Add geo grid to flexible pavement (see spec. section 012300)

Total Amount of Bid for Additive Alternate #1 (Insert Amount in Words and Numbers):

_____ $ _____

IV. ALLOWANCES : For electrical power service (see spec. section 012100)

_____ $ _____

Person Authorized to Sign Bid/Contract (Print)	Title of Person Signing
Address	Fax No.
City, State and Zip Code	☐ Local Headquarters (*Check one*) ☐ Local Branch Office
Telephone No.	E-mail Address

Name of the proposed **Project Manager:** _____

Name of the proposed **Site Superintendent:** _____

CITY OF SAN ANTONIO

Issued By: Transportation and Capital Improvements **Date Issued: March 18, 2016**
ID NO.: 23-01456

(010) FORMAL INVITATION FOR BIDS (IFB) to CONTRACT
DSD Staff Parking Lot #23-01456

Sealed bids, subject to the Terms and Conditions of this Invitation for Bids and other contract provisions, will be received at the Office of the City Clerk, City Hall, 100 Military Plaza, San Antonio, Tx 78205 until **2:00 P.M. CST** on **Tuesday, April 12, 2016** and publicly read aloud in **City Council Chambers, 114 W. Commerce, Municipal Plaza Building**. Bids must be submitted in a sealed envelope and clearly marked with the bidder's name, Project Name and ID NO. The City is not responsible for submissions not clearly and appropriately marked. Late submissions will be rejected and returned to bidder. A Non-Mandatory Pre-bid meeting will be held at 114 W. Commerce, San Antonio, TX 78205, 9th floor conference room on March 24, 2016 at 11:00 A.M. Deadline for questions is March 31, 2016 at 4.00 P.M.

This invitation includes the following Contract Documents:

- 010 Invitation for Bids and Contract Signature Page
- 020 Bid Form
- 030 Qualification Questionnaire
- 040 Standard Instructions to Respondent
- 041 Certificate of Interested Parties (TEC Form 1295)
- 050.01 SBEDA Guidelines
- ◘ Subcontractor/Supplier Utilization Plan
- 060 Supplemental Conditions
- 075 Performance Bond
- 076 Payment Bond
- 081 General Conditions for Construction Contracts
- ◘ Wage Decision

Plans, Specifications and Special Conditions may be purchased at a cost of **$125.00** per set (tax included) from the office of **Beaty Palmer Architects, Inc., 110 Broadway, Ste 600**, San Antonio, TX 78205; Phone: (210) 212-8022. No refund will be made for plan sets that are returned. Changes to Plans, Specifications and Special Conditions will be included in an addendum and will be posted on the web at **http://www.sanantonio.gov/purchasing/biddingcontract/opportunities.aspx** along with this solicitation. Bidder understands and agrees that bidder is responsible for obtaining addenda and adhering to all requirements in addenda. City is not responsible for incorrect information obtained through other sources.

The following documents (fully completed and with original signatures) constitute the required information to be submitted as a part of the bid proposal:

- 010 Invitation for Bids and Contract Signature Page
- 020 Bid Form
- 030 Qualification Questionnaire
- ◘ Bid Bond
- ◘ Subcontractor/Supplier Utilization Plan
- ◘ Signed Addenda Acknowledgement Forms
- ◘ Proof of Form 1295 with Certification Number & Date Filed

This is a Qualified Low Bid Solicitation. It is understood and agreed that the work is to be substantially completed on or before **120** calendar days. This project **does not** include hazardous environmental work. This project requires **1** project sign(s).

Small Business Economic Development Advocacy (SBEDA) Program Compliance – Respondents shall meet the subcontracting requirements as stated on Form 050.01 and on the Subcontractor/Supplier Utilization Plan posted with this solicitation on the City's website.

Wage Decision – Respondent shall meet the prevailing wage rate requirements established for this contract and shall reference the wage decision posted with this solicitation on the City's website.

The undersigned, by his/her signature, represents that he/she is authorized to bind the bidder to fully comply with Contract Documents for the amount(s) shown on the accompanying bid sheet(s). The work proposed to be done shall be accepted when fully completed and finished to the entire satisfaction of the City. The undersigned certifies all prices contained in this bid have been carefully checked and are submitted as correct and final. The bidder by submitting this bid and signing below, acknowledges that he/she has received & read the entire Bid and Contract document and agrees to be bound by the terms therein, has received all Addenda, and agrees to the terms, conditions, and requirements of the bidder's bid proposal and all documents listed in the tables above and the enabling Ordinance and associated documentation that form the entire Contract upon approval by the City Council.

Official Name of Company (legal):_____

_____/_____ Signer's Name: _____
Original Signature of Person Authorized to Sign Bid/Contract Date (Please Print or Type)

City of San Antonio

TRANSPORTATION AND CAPITAL IMPROVEMENTS

RECEIPT OF ADDENDUM NUMBER(S) **1** IS HEREBY ACKNOWLEDGED FOR THE PROJECT: **DSD STAFF PARKING LOT**

FOR WHICH BIDS WILL BE OPENED ON: **TUESDAY, APRIL 12, 2016 AT 2:00 P.M. CST**

*****THIS ACKNOWLEDGEMENT MUST BE SIGNED AND RETURNED WITH THE BID PACKAGE.*****

Company Name: _____

Address: _____

City/State/Zip Code: _____

Date: _____

_____
Signature

_____
Print Name/Title