CITY OF McALLEN

James E. Darling, Mayor

Aida Ramirez,	**Mayor Pro-Tem, Commissioner – District 4**
Javier Villalobos,	**Commissioner – District 1**
Joaquin J. Zamora,	**Commissioner – District 2**
J. Omar Quintanilla,	**Commissioner – District 3**
John Ingram,	**Commissioner – District 5**
Veronica Whitacre,	**Commissioner – District 6**

Roel Rodriguez, P.E., City Manager

Yvette Barrera, P.E., CFM, City Engineer

Gerardo Noriega, CTPM, Director of Purchasing & Contracting

Bid, Form of Agreement, Bonds and Specifications for

IFB BICENTENNIAL HIKE & BIKE TRAIL (RE-BID)

PROJECT NO. 09-18-C35-336

McAllen, Texas

DATED: SEPTEMBER 2018

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BID NOTICE

Solicitation Type and Name: Invitation for Bid for Bicentennial Hike & Bike Trail (Re-Bid)

Solicitation Number: 09-18-C35-336

Summary of Work*:* The Bicentennial Hike & Bike Trail improvements include a 15 space parking lot. Work extends from Nolana Ave. north to the existing rail road tracks. Improvements include erosion control, clearing, earthwork, grading, traffic control, curbing, parking lot, landscaping, irrigation (drip & bubbler), signage, lighting, concrete ADA ramps, sidewalks, driveway aprons, benches, trash receptacles, shade structure, bike racks, concrete pavers and other appurtenances.

Bid Opening: Sealed electronic bids addressed to Mr. Roel "Roy" Rodriguez P.E., City Manager will be received until **Thursday, September 27, 2018 at 3:00 p.m., Central Standard Time (CST**) at which time they shall be publicly opened in a meeting held in McAllen City Hall, 2nd Floor, Conference Room 2A. All bid responses are only to be submitted **electronically** through the City of McAllen's bidding portal: https://mcallen.procureware.com, on or before the aforementioned date and time. Hard copy and/or late bids shall not be accepted.

Pre-Submittal Conference: City of McAllen, City Hall, 2nd Floor, Conference Room 2A, 1300 Houston Ave, McAllen, Texas 78501 on **Thursday, September 20, 2018 at 2:00 p.m. CST.** All prospective respondents are encouraged to be in attendance.

To view this solicitation, access Plans and Specifications, and submit a bid response, you must first register in the City's bidding portal at https://mcallen.procureware.com. Solicitation documents will not be mailed, e-mailed, or provided in person. Once registered, you will also be added to the solicitation distribution list for changes and/or additions via Addenda form.

A Bidder's Bond from a reliable surety company licensed to operate in the State of Texas or certified Cashier's Check, (Bid Security) payable without recourse to the City of McAllen, for the amount of not less than five percent (5%) of the total bid shall be submitted via a sealed envelope as a guaranty that if awarded the contract, the bidder will enter into a contract with the City of McAllen. The Bidder's bid security shall be submitted before the above-mentioned electronic bid opening date and time. Failure to submit the bid security shall be grounds for disqualification.

Bid Security shall be delivered in a sealed envelope and clearly marked as follows:

BID SECURITY FOR PROJECT NO. 09-18-C35-336 BICENTENNIAL HIKE & BIKE TRAIL (RE-BID)

Hand-deliver Bid Security:	1300 Houston Avenue, Purchasing & Contracting Department
If using Land Courier (i.e., FedEx, UPS):	1300 Houston Avenue, Purchasing & Contracting Department McAllen, Texas 78501
Mail Bid Security:	P.O. Box 220, McAllen, TX 78505-0220

Potential bidders are asked to post their questions on our bidding portal under the tab labeled "Clarifications" under the relative project number.

The City of McAllen reserves the right to refuse and reject any or all Bids and to waive any or all formalities or technicalities, or to accept the Bid considered the best value to the City, and to hold the bids for a period of sixty **(60)** days without taking action.

Applicable Product Categories: 91226, 91336, 98852

CITY OF MCALLEN – PURCHASING & CONTRACTING DEPARTMENT

INFORMATION TO BIDDERS

1. SUBMITTAL OF BID

Sealed bids will be submitted electronically through the City of McAllen's bidding portal: https://mcallen.procureware.com. Each bid must be completely filled out and include all required supporting documentation. Bids submitted by facsimile (fax) will NOT be accepted. Submittal of a bid in response to this solicitation constitutes an offer by the Bidder, and if accepted by the City of McAllen, a contract. Bids which do not comply with these specifications may be rejected at the option of the City. Bids must be electronically received by the City of McAllen on or before bid opening date and time. No late Bids will be accepted and will be returned to Bidder unopened (if properly identified).

2. ELECTRONIC BID SUBMITTAL INSTRUCTIONS: Bidders must go online to the City's Bidding Portal (https://mcallen.procureware.com) to submit bid response. Bidders are asked to read the Welcome Screen (PDF document) and register if they have not done so previously. Once on the bidding portal, follow the steps below to enter the electronic bid:

I. Click on, "**Bids"** located on left-hand column.
II. Find the applicable project and click the, "**Project Number"**
III. Click on, "**Response"** tab.
IV. In the, "**Questions"** tab, upload required scanned documents into the bid portal by clicking "**Browse"** for each item.
V. Click on, "**Pricing"** tab and enter a Unit Price for each pricing item. A "**Comment**" field is available if needed.
VI. Once both the Questions and Pricing information has been entered, the yellow "**Question Response and Pricing Response**" information messages will change from incomplete to complete. Then the "**Submit**" button will become available.
VII. Click "**Submit Bid**" button and review the terms and agreements, Popup Window that appears. If you agree to the terms and conditions, click the "**I Accept and Submit this Bid**" button.
VIII. If you want to remove your bid, click the red, "**Withdraw Bid**" button in the "**Response**" tab.

The City may consider non-responsive any bid not prepared and submitted in accordance with the provisions herein and may waive any formalities and/or technicalities, or reject any and all bids.

3. BID SECURITY (BID BONDS/CASHIER'S CHECK)

The bidder is specifically advised that the bid must be accompanied by a bid security in the form of a certified cashier's check or a bid bond from a reliable surety company licensed to operate in the State of Texas totaling five percent (5%) of the greatest amount bid, as a guaranty that if awarded the bid, the successful contractor will enter into a contract with the City of McAllen. Cashier's checks and/or bid bonds will be returned to all except the three lowest bidders within five (5) days after opening of bids. The remaining cashier checks and/or bid bonds will be returned promptly after the successful contractor has entered into a contract with the City of McAllen. If no award has been made within sixty (60) days after opening of bids, cashier checks and/or bid bonds will be returned accordingly.

Bid security must be submitted in a sealed envelope marked in the upper left hand corner with the name of Bidder and Title of Project.

Hand-deliver Bid Security:	1300 Houston Avenue, Purchasing & Contracting Department (3rd Floor)
If using Land Courier (i.e., FedEx, UPS):	1300 Houston Avenue, Purchasing & Contracting Department (3rd Floor), McAllen, Texas 78501
Mail Bid Security:	P.O. Box 220, McAllen, TX 78505-0220

INFORMATION TO BIDDERS continued:

4. PAYMENT AND PERFORMANCE BONDS

The successful bidder shall furnish a Payment Bond and Performance Bond in the amount of 100% of the contract sum, within ten (10) days from letter of award of contract and upon the forms which are attached hereto. The Payment and Performance Bonds shall be from an approved surety company authorized to do business in the State of Texas (and acceptable according to the latest list of companies holding certificates of authority from the United States Department of the Treasury) and acceptable to Owner.

4.1 A Payment Bond is required if the Contract Sum is $25,000 or over. The payment bond is to be for the Contract Sum and is payable to Owner solely for the protection and use of payment bond beneficiaries.

If the total contract sum is between $25,000 and less than $50,000, the successful contractor has the option to enter into a single payment contract with the City of McAllen in lieu of a Payment Bond, provided that no money shall be paid to the contractor until completion of the work by the contractor and acceptance of same by the City of McAllen.

4.2 A Performance Bond is required if the Contract Sum is $50,000 or over. The performance bond is to be for the Contract Sum and is solely for the protection of Owner to guarantee the faithful performance of the Work in accordance with the Contract Documents. The performance bond shall be effective through Contractor's warranty period.

On all contracts that will equal to or exceed $50,000.00, the performance bond and the payment bond must be provided from a surety that has a rating of "A" from AM BEST, MOODY'S or STANDARD & POORS.

5. BID FORMS

Bidders are advised that it shall be a mandatory requirement of this project that all bidders shall submit their bids utilizing only the forms that make up this bid package. Bids submitted utilizing other forms and/or formats will not be considered. Bidders must submit an electronic version of their bid through our bidding portal at https://mcallen.procureware.com.

6. PREPARATION OF BID

Bids MUST give full firm name and address of bidder and be manually or electronically signed. Failure to do so will disqualify your bid. Person signing bid must show title or AUTHORITY TO BIND HIS/HER FIRM IN A CONTRACT. Firm name and authorized signature must appear on each page that calls for this information. The legal status of the Bidder whether corporation, partnership, or individual, shall also be stated in the bid. A corporation shall execute the bid by its duly authorized officers in accordance with its corporate by-laws and shall also list the state in which it is incorporated. A partnership Bidder shall give full names and addresses of all partners. All partners shall execute the bid. Partnership and Individual Bidder shall state in the names and addresses of all persons with a vested interest therein. The place of residence of each Bidder, or the office address in the case of a firm or company with county and state and telephone number, shall be given after the signature.

7. ALTERATIONS/AMENDMENTS

Bids CANNOT be altered or amended after opening time. No bid may be withdrawn after opening time without acceptable reason in writing and only after approval by the City of McAllen.

INFORMATION TO BIDDERS continued:

8. SUBSTITUTIONS
No substitutions or cancellations shall be permitted without written approval by City of McAllen.

9. SALES TAX
The City of McAllen is exempt from all Federal Excise Tax and the State of Texas Limited Sales Excise and Use Tax. **STATE SALES TAX MUST NOT BE INCLUDED IN BID.**

10. NO BID RESPONSE
If unable to bid, no further action is required by bidder; however, we encourage all bidders to examine their selected categories and revise if necessary.

11. COSTS FOR PREPARATION OF BID
The City of McAllen shall not be held liable for any costs incurred by any bidder for work performed in the preparation of and production of a bid or for any work performed prior to execution of contract.

12. FIRM PRICES
Unit prices for all items bid must be firm on bid opening date and continue to remain firm for the duration of the contract term. Bidders must make allowances for any and all peripheral costs associated with the Work. These allowances must be reflected in the unit prices bid per Work rendered. Bids having statements addressing unknown charges, above and beyond the unit prices bid to the City of McAllen will not be considered and shall be looked upon as non-responsive. Bids submitted with the potential of added costs based on market fluctuations and/or trends shall not be considered and shall be looked upon as non-responsive.

13. METHOD OF AWARD
Bidders are advised that the City of McAllen will award a Construction Contract based on "Lowest Responsive Responsible Bidder" meeting the requirements of the specifications. The City of McAllen may elect to award to the bidder who, in the opinion of the City of McAllen, is providing the best value for the City, as described in Local Government Code 252.043. All items will be evaluated and awarded individually or in any combination thereof. The City of McAllen's decision shall be final.

14. TIME ALLOWED FOR ACTION TAKEN
The City may hold the bids received for up to sixty **(60)** days after bid opening without taking action. Bidders shall be required to hold their Bids firm for the same period of time.

15. RIGHT TO WAIVE
The City of McAllen/McAllen Public Utility reserves the right to waive or take exception to any part of these specifications when in the best interest of the City of McAllen/McAllen Public Utility.

16. RIGHT TO REJECT/AWARD
The City of McAllen/McAllen Public Utility reserves the right to refuse and reject any or all Bids, and to waive any or all formalities or technicalities, and to make such awards of contract as may be deemed to be the best and most advantageous to the City of McAllen/McAllen Public Utility.

INFORMATION TO BIDDERS continued:

17. PAST PERFORMANCE

Bidders are advised that past performance, as it relates to product and/or service on Purchase/Service/Supply Contracts previously held with the City, shall be a factor in the evaluation and award of this Service Contract. Bidders that have not complied with their obligation(s) to the City of McAllen/McAllen Public Utility on previous projects will not be considered for award of this project. The City's position on this matter shall be final.

18. INTERPRETATIONS

Any questions concerning the conditions and/or specifications with regards to this solicitation for bids shall be directed to the designated individuals as outlined in the Invitation to Bid. Such interpretations, which may affect the eventual outcome of this Invitation to Bid, shall be furnished in writing to all prospective Bidders via Addendum. No interpretation shall be considered binding unless provided in writing by the City of McAllen in accordance with paragraph entitled "Addenda".

19. ADDENDA

Bidder shall carefully examine the solicitation documents, bid forms, plans, specifications, visit the project site, and fully inform themselves as to all conditions and matters which can in any way affect the work or cost thereof. Should the bidder find discrepancies in, or omissions from bid forms, solicitation documents, or other documents, or should bidder be in doubt as to their meaning, bidder should request clarification by posting their questions on the City's bidding portal under the tab labeled "Clarifications" under the applicable project number prior to submitting any bid. Explanations, interpretations, and supplemental instructions shall be in the form of written Addenda which shall become a part of the solicitation and contract documents. Said Addenda shall be posted in the bidding portal. All Addenda issued in respect to this project shall be considered official changes to the original bidding documents. Verbal statements in response to inquiries and/or requests for explanations shall not be authoritative nor binding. It shall be the Bidder's responsibility to ensure that they have received all Addenda in respect to this project. Furthermore, bidders are advised that they must recognize, comply with, and attach a signed copy of each Addendum which shall be made part of their Bid Submittal. Bidder's signature on Addenda shall be interpreted as the respondent's "recognition and compliance to" official changes as outlined by the City of McAllen and as such are made part of the original solicitation documents. Failure of any bidder to receive any such addendum or interpretation shall not relieve such Contractor/Bidder from its terms and requirements. Addenda are available online at https://mcallen.procureware.com.

20. OMISSIONS

At the time of the bid opening, each bidder will be presumed to have read and to be thoroughly familiar with the requirements of the bid. The failure or omission of any bidder to examine any form, instrument, or contract document shall in no way relieve any bidder from any obligation in respect to their bid.

21. MATHEMATICAL ERRORS

In the event that mathematical errors exist in any bid, unit prices/rates -v- totals, unit prices/rates will govern.

22. HUB CERTIFICATION

State Certified **"HUB Vendor(s)"** are asked to provide a copy of their certification, if they have not previously done so. Information to be emailed to the following email address: bids@mcallen.net.

INFORMATION TO BIDDERS continued:

23. PUBLIC INFORMATION

All information, documentation, and other materials submitted in response to this solicitation are considered non-confidential and/or non-proprietary and are subject to public disclosure under the Texas Public Information Act (Texas Government Code, Chapter 552.001, et seq.) after the solicitation is completed. Any information deemed to be confidential by the bidder, including trade secrets, should be clearly noted on the pages where confidential information is contained.

24. STATUTORY REQUIREMENTS

It shall be the responsibility of the successful Bidder to comply with all applicable State & Federal laws, Executive Orders and Municipal Ordinances, and the Rules and Regulations of all authorities having jurisdiction over the work to be performed hereunder and such shall apply to the contract throughout, and that they will be deemed to be included in the contract as though written out in full in the contract documents. (To include issues related to health, environmental, and safety to name a few.)

25. ANTI-LOBBYING PROVISION

During the period between proposal submission date and the contract award, bidders, including their agents and representatives, shall not directly discuss or promote, verbal or written, their bid with any member of the City Commission, Bridge Board members directly or indirectly through others, seek to influence any City Council member, City staff, or City's Contractor(s) regarding any matters pertaining to this solicitation, except as herein provided. If a representative of any Bidder violates the foregoing prohibition by contacting any of the above listed parties with whom contact is not authorized, such contact may result in the Bidder being disqualified from the procurement process. Any oral communications are considered unofficial and non-binding with regard to this bid. Violation of this provision may result in the rejection of the bidder's bid, except in the course of City-sponsored inquiries, briefings, interviews, or presentations.

26. ANTI-COLLUSION STATEMENT

The respondent shall submit a Non-Collusion affidavit affirming that the bidder has not in any way directly or indirectly, colluded, conspired, or agreed with any other person, firm, corporation, respondent or potential respondent to the amount of this proposal or the terms or conditions of this proposal. Paid or agreed to pay any other person, firm, corporation respondent or potential respondent any money or anything of value in return for assistance in procuring or attempting to procure a contract or in return for establishing the prices in the submitted bid or the bid of any other respondent.

27. CONFLICT OF INTEREST

CHAPTER 176 OF THE TEXAS LOCAL GOVERNMENT CODE

Effective January 1, 2006, Chapter 176 of the Texas Local Government Code requires that any vendor or person considering doing business with a local government entity disclose in the Questionnaire Form CIQ, the vendor or person's affiliation or business relationship that might cause a conflict of interest with a local government entity. By law, this questionnaire must be filed with the records administrator of the City of McAllen not later than the seventh (7^{th}) business day after the date the person becomes aware of facts that require the statement be filed. See Section 176.006, Local Government Code.

A person commits an offense if the person violates an offense under this section is a Class C misdemeanor.

For more information or to obtain Questionnaire CIQ go to the Texas Ethics Commission web page at www.ethics.state.tx.us/forms/CIQ.pdf.

INFORMATION TO BIDDERS continued:

27. CONFLICT OF INTEREST continued:
IF YOU HAVE ANY QUESTIONS ABOUT COMPLIANCE, PLEASE CONSULT YOUR OWN LEGAL COUNSEL. COMPLIANCE IS THE INDIVIDUAL RESPONSIBILITY OF EACH PERSON OR AGENT OF A PERSON WHO IS SUBJECT TO THE FILING REQUIREMENT. AN OFFENSE UNDER CHAPTER 176 IS A CLASS "C" MISDEMEANOR.

28. HOUSE BILL (HB) 1295 (Certificate of Interested Parties – Form 1295)
Please be advised that in 2015, the Texas Legislature adopted House Bill 1295 (H.B. 1295). For contracts entered into on or after January 1, 2016, Texas Government Code Chapter §2252.908 (H.B. 1295) provides that a Texas governmental entity or state agency may not enter into a contract that either (1) requires an action or vote by the governing body of the entity or agency or (2) has a value of at least $1 million, unless the business entity submits a disclosure of interested parties to the governmental entity or state agency at the time the business entity submits the signed contract to the governmental entity or state agency.

The Texas Ethics Commission (Commission) has adopted a certificate of interested parties form (Form 1295) and adopted rules requiring the business entity to file Form 1295 electronically with the Commission. Information from the Commission regarding the requirements, including rules and filing information, are available on the Commission's website at the following links:

https://www.ethics.state.tx.us/tec/1295-Info.htm
https://www.ethics.state.tx.us/whatsnew/FAQ_Form1295.html
https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm

As a business entity under this law, it is your firm's responsibility to comply with all disclosure laws including Chapter 2252. The City of McAllen, as the governmental entity, must ensure compliance of the same.

Note: You will be required to register and create an account. Once registered, you will receive an email containing a password setup link. Click on the link to set your password. After you have established an account, you will use your email address, password, and user type (Business Entity) to log in to the filing application to enter the required information on Form 1295. Print a copy of the completed form which includes a unique certification of filing number assigned by the application. An authorized agent of the business entity must sign the form affirming under the penalty of perjury that the completed form is true and correct. The completed, printed, and signed Form 1295 bearing the unique certification of filing number must be submitted at the time the signed contract is submitted to the City of McAllen/McAllen Public Utility. Failure to comply may result in contract revocation and award to the next compliant contractor/vendor.

29. DISCLAIMER
While all precautions have been taken to ensure that documents on the bidding portal will not interfere with or cause damage to your system or its existing data, the City of McAllen accepts no responsibility for damages that may be caused by these documents and makes no other warranty or representation, neither expressed nor implied, with respect to these documents. These documents are provided "as is" and you, the user, assume the entire risk when you use them.

INFORMATION TO BIDDERS continued:

30. LIMITATION OF LIABILITY

Vendors that use the services available through the bidding portal agree that the City of McAllen shall not be liable for any loss of profits, loss of time, interruption of business, or indirect, special, incidental, or consequential damages of any kind whether under this agreement or otherwise due to vendor's use of this system.

31. WAIVER

Due to the electronic transmissions, the City of McAllen does not guarantee nor will it be liable for the accuracy of what is read or what is downloaded.

32. NON-APPROPRIATION CLAUSE

In the event that no funds are appropriated for this specific work, the City of McAllen reserves the right to cancel/terminate this contract. The City of McAllen shall be relieved of any and all responsibilities and/or obligations, without penalty(ies) of any sort. The vendor shall be notified in written form of the City of McAllen's intent to cancel/terminate said contract due to non-appropriated funds.

33. NON-DISCRIMINATION/DRUG FREE

The successful Respondent will comply with all federal and state requirements concerning fair employment and will not discriminate by reason of race, color, age, religion, sex, national origin or physical handicap. The successful Respondent shall provide evidence in form and substance, to the City of McAllen of maintaining a drug free working environment.

34. MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISES (MWBE)

The City of McAllen encourages the hiring and participation by MWBEs in the performance of the contract.

35. INSURANCE REQUIREMENTS

During execution of Contracts, the successful Prime Contractor shall provide a Certificate of Insurance made to the City of McAllen, P.O. Box 220, McAllen, TX 78505-0220, (1300 Houston, McAllen, Texas 78501) and should reference the project number and project Name. The prime contractor shall ensure that any and all subcontractors and/or lower-tier subcontractors comply with the insurance requirements as depicted herein. Such coverage(s) shall be acquired and maintained, for the duration of the contract period. (See Section 28. Insurance Requirements of the General Conditions of Contract for additional information.)

END OF SECTION

THIS PAGE MUST BE UPLOADED TO PROCUREWARE & MADE PART OF YOUR BID SUBMITTAL

BID FORM

TO: OWNER

The undersigned, as bidder, declares that the only person or parties interested in this bid as principals are those named herein and that this bid is made without collusion with any other person, firm or corporation; the bidder has carefully examined the Bid Notice, Information to Bidders, Form of Agreement, General and Supplemental General Conditions, Special Provisions, Technical specifications and the plans thereon referred to and has carefully examined the locations, conditions, and classes of materials of the proposed work; and 3) Bidder agrees that if awarded the Contract, bidder shall provide all the necessary labor, machinery, tools, apparatus, and other items incidental to construction, and will do all the work and furnish all the materials called for in the contract and specifications in the manner prescribed therein and according to the requirements of the Engineer/Architect as therein set forth.

It is understood that the following quantities of work to be done at unit prices are approximate only and are intended principally to serve as a guide in evaluating bids.

It is further agreed that the quantities of work to be done at unit price and materials to be furnished, may be increased or diminished as may be considered necessary, in the opinion of the Engineer/Architect, to complete the work fully as planned and contemplated, and that all quantities of the work, whether increased or decreased, are to be performed at the unit prices set forth below except as provided for in the specifications.

It is further agreed that lump sum prices may be increased to cover additional work ordered by the Engineer/Architect, but not shown on the plans or required by the specifications, in accordance with the provisions of the General Conditions. Similarly, they may be decreased to cover deletion of work so ordered.

The undersigned agrees, unless hereinafter stated otherwise to furnish all materials as shown and specified in the Plans and Specifications.

A bid security in the amount of five percent (5%) of the Total Bid must be submitted in compliance with the Information to Bidders.

It is understood that in the event the successful bidder fails to enter into the Form of Agreement and/or furnish an acceptable Payment and Performance Bond, each in the amount of one hundred percent (100 %) of the Contract Sum, within ten (10) working days of the Letter of Award, the successful bidder shall forfeit the bid security and the bid security shall become the property of the City of McAllen, TX.

It is understood that the City may consider non-responsive any bid not prepared and submitted in accordance with the provisions herein and may waive any formalities and/or technicalities, or reject any and all bids.

THIS PAGE MUST BE UPLOADED TO PROCUREWARE & MADE PART OF YOUR BID SUBMITTAL

BID FORM Continued:

The following table describes the bid items and quantities reflected on the official bid form maintained on the City's bidding web portal. Do not enter bid amount in this table. Refer to the Information to Bidders (Pages B-1 and B-2) for instructions on how to submit electronic sealed bids. (Bidders are asked to check their submittals in an effort to avoid discrepancies).

BID ITEMS DESCRIPTIONS AND QUANTITIES APPROXIMATE ONLY:

Item No.	Internal Ref. No.	Type	Description	UOM	Quantity
1	926-94-00101	BASE	STORMWATER POLLUTION PREVENTION PLAN (SW3P) & IMPLEMENTATION	LS	1
2	968-84-00102	BASE	TRAFFIC CONTROL PLAN PREPARED BY LICENSED PROFESSIONAL ENGINEER (TEXAS); FURNISH AND MAINTAIN ALL DEVICES	LS	1
3	912-19-00103	BASE	CLEARING AND GRUBBING	LS	1
4	988-14-00104	BASE	TEMPORARY EROSION & SEDIMENT CONTROL	LS	1
PARKING LOT AREA					
5	913-36-00105	BASE	2 IN. HMAC (TYPE D), LIMESTONE AGGREGATE	SY	623
6	750-52-00106	BASE	8 IN. FLEXIBLE BASE (TY F, GR 4)	SY	777
7	988-32-00107	BASE	6 IN. STABILIZED SUBGRADE; LIME TREATED (2% BY WEIGHT)	SY	792
8	912-23-00108	BASE	EXCAVATION & GRADING; PARKING LOT	CY	220
9	913-19-00109	BASE	12 IN. REINFORCED CONCRETE HEADER CURB	LF	239
10	913-19-00110	BASE	24 IN. CONCRETE CURB & GUTTER	LF	66
11	914-30-00111	BASE	CONCRETE DRIVEWAY APRON (6 IN. THICK)	SY	102
12	914-30-00112	BASE	CONCRETE SIDEWALKS (4 IN. THICK)	SY	235
13	913-47-00113	BASE	SIDEWALK RAMP (TYPE 7)	EA	2
14	210-30-00114	BASE	CONCRETE CAR STOPS	EA	15
15	968-61-00115	BASE	PAVEMENT MARKINGS & SIGNAGE	LS	1
16	912-23-00116	BASE	EXCAVATION & GRADING; BIOSWALE	CY	87
17	658-60-00117	BASE	BIOSWALE OUTLET; INCL. ALL PIPING & APPURTENANCES	LS	1
18	330-37-00118	BASE	ACCESS GATE	EA	1
19	305-78-00119	BASE	CONSTRUCTION STAKING	LS	1

THIS PAGE MUST BE UPLOADED TO PROCUREWARE & MADE PART OF YOUR BID SUBMITTAL

BID FORM Continued:

IRRIGATION					
20	658-60-00120	BASE	SCHEDULE 40 PVC 4" MAIN LINE	LF	2905
21	658-60-00121	BASE	PIPE SLEEVES SCH. 40 PVC	LF	297
22	658-60-00122	BASE	3/4 IN. IRRIGATION LINES	LF	1242
23	658-60-00123	BASE	1 IN. IRRIGATION LINES	LF	2235
24	658-60-00124	BASE	1-1/4 IN. IRRIGATION LINES	LF	2386
25	658-60-00125	BASE	1 ½ IN. IRRIGATION LINES	LF	2165
26	658-60-00126	BASE	2 IN. IRRIGATION LINES	LF	2338
27	658-60-00127	BASE	2-1/2 IN. IRRIGATION LINES	LF	260
28	670-77-00128	BASE	QUICK COUPLER VALVES	EA	2
29	670-17-00129	BASE	RAIN BIRD1804SAM-PRS 15SERIES MPR 6" (OR EQUAL)	EA	472
30	670-17-00130	BASE	RAIN BIRD RWS-M-B-C MINI ROOT SYSTEM (OR EQUAL)	EA	94
31	670-17-00131	BASE	DRIPLINE	SF	2747
32	670-17-00132	BASE	RAIN BIRD PESB-PRS-D 2" (OR EQUAL)	EA	24
33	670-17-00133	BASE	SHUT OFF VALVE	EA	1
34	670-17-00134	BASE	2" R.P BACKFLOW PREVENTER	EA	1
35	670-17-00135	BASE	IRRIGATION CONTROLLER	EA	1
LANDSCAPE					
36	595-75-00136	BASE	EBONY TREES	EA	12
37	595-75-00137	BASE	ANACUA TREES	EA	12
38	595-75-00138	BASE	CEDAR ELM	EA	12
39	595-75-00139	BASE	TEXAS SABAL PALM	EA	8
40	595-75-00140	BASE	MEXICAN FAN PALM	EA	3
41	595-75-00141	BASE	BIRD OF PARADISE	EA	12
42	595-75-00142	BASE	TURKS CAP	EA	15
43	595-75-00143	BASE	BOUGAINVILLEA	EA	9
44	595-75-00144	BASE	TEXAS SAGE	EA	15
45	595-75-00145	BASE	ORANGE ZEXENIA	EA	40

THIS PAGE MUST BE UPLOADED TO PROCUREWARE & MADE PART OF YOUR BID SUBMITTAL

BID FORM Continued:

LANDSCAPE (continued)					
46	595-75-00146	BASE	LINDHEIMER MUHLY GRASS	EA	23
47	595-75-00147	BASE	GREGGS MIST FLOWER	EA	72
48	595-75-00148	BASE	BIOSWALE GRASS MIX	SF	940
49	595-63-00149	BASE	BOULDERS	EA	6
50	330-38-00150	BASE	VINYL FENCE	LF	1876
51	330-13-00151	BASE	6 FT VINYL CHAIN LINK FENCE / WITH GATE	LF	40
52	913-19-00152	BASE	6 IN LANDSCAPE CONCRETE CURB	LF	176
53	155-85-00153	BASE	SHADE STRUCTURES INSTALLATION TO INCLUDE ANCHOR SYSTEM AS NEEDED COMPLETE IN PLACE; SHADE STRUCTURE PROVIDED BY OWNER	EA	1
54	450-34-00154	BASE	GROUND MOUNT TRASH RECEPTACLES WITH LINER AND LID COMPLETE IN PLACE	EA	5
55	557-12-00155	BASE	BIKE RACKS INSTALLATION TO INCLUDE ANCHOR SYSTEM AS NEEDED; BIKE RACKS TO BE PROVIDED BY OWNER	EA	1
56	650-06-00156	BASE	METAL BENCHES	EA	4
57	225-32-00157	BASE	DRINKING WATER FOUNTAINS COMPLETE IN PLACE; WATER FOUNTAIN TO BE PROVIDED BY OWNER	EA	1
58	750-35-00158	BASE	CONCRETE PAVER STONE COMPLETE IN PLACE	SF	3163
59	790-70-00159	BASE	TOP SOIL AND COMPOST MIX 3/1 RATIO	SF	3173
60	335-72-00160	BASE	MULCH/BEDS & TREE RINGS LABOR – MULCH PROVIDED BY OWNER	SF	3173
61	335-72-00161	BASE	HYDRO-SEED – AREAS AROUND PARKING LOT AND ALL OTHER DISTURBED AREAS ALONG TRAIL	SF	20000
ELECTRICAL (SEE NOTES BELOW)					
62	285-56-00162	BASE	LIGHT POLES & FIXTURES COMPLETE IN PLACE / POLES & FIXTURES PROVIDED BY OWNER	EA	21
63	285-14-00163	BASE	ELECTRICAL PANEL COMPLETE IN PLACE	EA	1
64	285-26-00164	BASE	ELECTRICAL CONDUIT	LS	1

THIS PAGE MUST BE UPLOADED TO PROCUREWARE & MADE PART OF YOUR BID SUBMITTAL

BID FORM Continued:

NOTES:

LANDSCAPE SITE FURNITURE

- Shade structure will be provided by OWNER and installed by CONTRACTOR.
- Drinking fountain will be provided by OWNER and installed by CONTRACTOR.
- Bike rack will be provided by OWNER and installed by CONTRACTOR.

ELECTRICAL

- OWNER WILL PROVIDE:
  1. (21) – Light fixtures with anchor bolts
  2. (21) – Light poles
  3. (1) – Transformer- 5KVA
  4. (1) – Panel with interior
- CONTRACTOR will coordinate with AEP for any information needed.

Bidder hereby agrees to commence work under this contract within ten (10) working days after Notice to Proceed is issued by the City.

Bidder hereby agrees to complete work within _____ (_____) working days, not to include City-recognized holidays. [Number of working days to complete work shall not exceed one-hundred (100) days.]

DATE: _____

Respectfully submitted,

BY: _____
(Signature)

_____
(Type or Print Name of Authorized Signer)

_____
(Title)

_____
(Legal Company Name)

_____
(Address)

_____

_____
(Phone Number)

_____
(Fax Number)

_____
(E-Mail)

(Seal - If bidder is a Corporation)

THIS PAGE MUST BE UPLOADED TO PROCUREWARE & MADE PART OF YOUR BID SUBMITTAL

SUPPLEMENT NO. 1 TO BID FORM: NON-RESIDENT BIDDER

NON-RESIDENT BIDDER: Non-resident bidder is a bidder whose principal place of business is not in the State of Texas, but excludes a contractor whose ultimate parent company or majority owner has its principal place of business in the State of Texas.

Nonresident Bidder: Yes_____ No_____

If yes, does your state have a preference law?

Yes _____ No_____

Percent (%) of preference _____

_____
(Date)

_____
(Type or Print Name)

_____
(Title)

_____
(Company)

_____
(Address)

_____

_____
(Phone Number)

_____
(Fax Number)

THIS PAGE MUST BE UPLOADED TO PROCUREWARE & MADE PART OF YOUR BID SUBMITTAL

SUPPLEMENT NO. 2 TO BID FORM: BOND INFORMATION

(Form to be Executed & Submitted with Bid)

On all contracts that will equal to or exceed $50,000.00, the Performance Bond and the Payment Bond must be provided from a surety that has rating of "A" from AM BEST, MOODY'S STANDARD & POORS.

MAIN COMPANY

AGENT'S NAME: _____
PLEASE TYPE/PRINT NAME

COMPANY NAME: _____

ADDRESS: _____

_____

MAIN OFFICE TELEPHONE NO.: _____

LOCAL COMPANY

AGENT'S NAME: _____
PLEASE TYPE/PRINT NAME

COMPANY NAME: _____

ADDRESS: _____

_____

LOCAL MAIN OFFICE TELEPHONE NO.: _____

PROJECT NO.: _____

PROJECT NAME: _____

CONTRACTOR: _____
SIGNATURE

_____
PLEASE TYPE/PRINT NAME

_____
COMPANY NAME

THIS PAGE MUST BE UPLOADED TO PROCUREWARE & MADE PART OF YOUR BID SUBMITTAL

SUPPLEMENT NO. 3 TO BID FORM: NON-COLLUSION AFFIDAVIT

STATE OF _____

COUNTY OF _____

_____, of lawful age, being first duly sworn, on oath says, that (s)he is the agent authorized by the bidder to submit the attached bid. Affiant further states that the respondent/bidder has not been a party to any collusion among bidders in restraint of freedom of competition by agreement to purpose at a fixed price or to refrain from proposing; or with any state official, city employee, Board Trustee, or benefit consultant as to quantity, quality, or price in the prospective contract, or any other terms of said prospective contact; or in any discussions or actions between bidders, city employee, Board Trustee, or benefit consultant concerning exchange of money or other things of value for special consideration in the letting of this contract.

_____
Signature

Subscribed and sworn to before me this _____ day of _____, 2018.

_____
Notary Public
State of_____
My Commission Expires: _____

SPECIAL PROVISIONS

IN ALL CASES WHERE THESE SPECIAL PROVISIONS CONFLICT WITH THE TECHNICAL SPECIFICATION SECTIONS, GENERAL CONDITIONS OF THE AGREEMENT, SUPPLEMENTARY GENERAL CONDITIONS, CONTRACT CONDITIONS, OR ANY OTHER DOCUMENT CONTAINED HEREIN, THESE SPECIAL PROVISIONS SHALL GOVERN.

1. Definitions:
    a. OWNER – shall be the **City of McAllen or a representative of the Parks Department**
    b. CITY – shall be the **City of McAllen**

2. The CONTRACTOR shall do all necessary erosion control, clearing & grubbing, grading, excavation, trenching, dewatering, backfill, etc., to complete the project. Such costs shall be subsidiary to the bid items in the Proposal. All excavation is unclassified. All material removed such as concrete, broken pipe, excess backfill, etc., and not deemed salvageable shall become the property of the CONTRACTOR and he shall be responsible for removing it from the site at no extra expense to the OWNER. Existing material, fencing or fixtures deemed salvageable by the OWNER shall be carefully removed and hauled to a designated location as directed by the OWNER within the City at no extra expense to the OWNER.

3. All trees, plants, grass and shrubs, except those which will be affected by construction shall be protected at all times and properly maintained (mow grass, pruning, pull out weeds, weed-eat all edgings) and clean-up with-in the construction limits to be included. The areas in and adjacent to the construction site shall be restored to their original conditions if damaged during construction. The CONTRACTOR shall provide specified grass type to restore damaged areas. Only quality topsoil shall be used for filling the top four inches of those areas damaged or filled.

4. Damages done to existing utilities, power poles, fences, signs, mailboxes, driveways, culverts, pavement, drainage systems, etc. shall be repaired by the CONTRACTOR, at no cost to the OWNER, and such costs shall be subsidiary to the various unit items in the Proposal.

5. The City of McAllen shall provide all construction material testing to be paid for by OWNER, but re-testing shall be charged to the CONTRACTOR for failed testing and no additional compensation will be made or allowed for reworking the necessary defective work not meeting the specified work from the plans and specifications. Any re-testing required by no-passing results shall be paid for by the CONTRACTOR in which the city shall furnish the failed ticket invoices.

6. The CONTRACTOR shall furnish the Site Inspector and Observer, and OWNER, the names, address and telephone numbers of all personnel responsible for the work in case of Emergencies.

7. The successful CONTRACTOR shall attend a pre-construction conference with the OWNER, CONSULTANTS and other Officials at a date and time to be specified.

8. All work must be performed during regular business hours of 8 a.m. to 5 p.m., Monday thru Friday, except City recognized holidays. The CONTRACTOR may request work outside these

hours, if the CONTRACTOR will require the presence of a Site Inspector, CONTRACTOR will incur charges for the presence of the Site Inspector, a cost of which will be borne by the CONTRACTOR. No cost for the Site Inspector will be charged should the work be requested by the CITY. CONTRACTOR shall coordinate all work where construction work is to be in project area with other contractors and CITY OF MCALLEN.

9. The Plans show approximate locations of existing utilities including gas lines, telephone lines, power lines, water lines, sewer lines, storm sewers and irrigation lines within the vicinity. The CONTRACTOR is responsible for locating all existing utilities and shall exercise extreme care in working in the vicinity of these lines. Should the contractor identify any conflicts with the existing facilities as located in the field and the information as shown on the plans, the CONTRACTOR shall immediately notify the following:

   City of McAllen – Engineering Department & Parks & Recreation Department
   Mario Cruz, P.E. – (956)681-1164
   Sergio Saldaña - Construction Manager (956) 681-3333

   All existing lines, whether belonging to City or Private, shall remain in operation at all times. Switchover time, re-connecting new service from existing lines or services (if any) shall be kept to a minimum. CONTRACTOR shall be responsible for any re-connects, temporary or otherwise, of all water and sanitary sewer lines required to complete the project. Unless otherwise specified in the bid proposal form, payment for such items shall be subsidiary to all the various items of the bid.

10. The OWNER reserves the right to add or delete quantities of bid items in the Proposal at the Unit Prices given, provided however that such additions or reductions are within the aggregate limits specified in the General Conditions of the Agreement.

11. Until FINAL acceptance by the OWNER all of the material as provided for in these specifications shall be under the charge and care of the CONTRACTOR and he shall take every necessary precaution against injury or damage to any part of the material by action of the elements from the non-execution of the work. The CONTRACTOR shall rebuild, repair, restore and make good, at his own expense, all injuries or damage to any portion of the materials before its' completion and acceptance.

12. In cases where the CONTRACTOR deems extra compensation is due him for materials not clearly covered in the contract or not ordered by the OWNER as an extra item, the CONTRACTOR shall notify the OWNER in writing (Request for Information) of his intention to make claim for such extra compensation before he begins the work. The CONTRACTOR shall not proceed until the OWNER, and CONTRACTOR approve a written CHANGE ORDER. Failure on the part of the CONTRACTOR to give such notification or to afford the OWNER proper facilities for keeping strict account of actual costs shall constitute a waiver of the claim for such extra compensation. The filing of such notice by the CONTRACTOR and the keeping of costs by the OWNER shall not in any way be construed to prove the validity of the claim. When the work has been completed, the CONTRACTOR shall, within 10 days, file his claim for extra compensation with the OWNER.

13. Upon the failure of the CONTRACTOR to repair satisfactorily or to remove and replace, if so directed, rejected, unauthorized, or condemned materials immediately after receiving formal notice from the OWNER, the OWNER may recover for such defective materials on the CONTRACTOR'S bond, or by action in a court having proper jurisdiction over such matters, or may employ labor and equipment and satisfactorily repair or remove and replace such work and charge the cost of the same to the CONTRACTOR, which cost will be deducted from any money due him.

14. Saw cutting of existing asphalt or concrete for construction joints will be the only accepted method.

15. The CONTRACTOR shall warrant all work for a period of not less that one (1) year from the date of final acceptance of the work by the OWNER. CONTRACTOR is responsible for scheduling a final inspection in the presence of the OWNER, and CONTRACTOR, whereupon all items must be in accordance with plans and specifications, prior to final acceptance.

16. The CONTRACTOR is responsible for familiarizing himself and following the project plans, project specifications and City of McAllen Standard Specifications for those items not specifically shown on the project plans or project specifications.

17. All work will be coordinated with the City of McAllen Parks & Recreation Department.

18. All work shall be performed in compliance with all federal, state, and local laws including governing bodies and guidelines.

19. Relocations of existing fences, mailboxes, driveways, culverts, pavement, drainage systems, etc. (where not indicated on plans) shall be repaired by the CONTRACTOR at no cost to the OWNER, and such costs shall be subsidiary to the various unit items in the Proposal.

20. Submittals and/or shop drawings for all bid items shall be provided to OWNER prior to construction. Contractor is responsible for submission of a master submittals list.

21. The CONTRACTOR shall coordinate with the City of McAllen and other County, State and Federal agencies to keep access at all times to adjacent property owners during construction. Any temporary drives used shall be coordinated with the City of McAllen. No separate pay.

22. The City of McAllen reserves the right to award the projects individually or in any combination thereof.

23. Contractor will be responsible for observance of all activities relating to the construction of project including Security activities, pedestrian traffic and high vehicular traffic times so as not to interfere with project activities.

24. Contractor shall coordinate with City of McAllen prior to any City lane closures.

END OF SECTION

FORM OF AGREEMENT FOR ENGINEERING/ARCHITECTURAL CONSTRUCTION

This Agreement is made as of _____, 20_____, (the "Effective Date") by and between

The Owner: The City of McAllen, acting herein through the Board of Commission

and Contractor: _____

for the Project: Bicentennial Hike & Bike (Re-Bid)

Project Number: 09-18-C35-336

The Owner and the Contractor agree as follows:

ARTICLE 1. SCOPE OF THE WORK

The Contractor hereby agrees to furnish all of the materials and all of the equipment and labor necessary and to perform all of the Work in accordance with the Owner's requirements and as shown on the drawings and described in the specifications for the project entitled **IFB – BICENTENNIAL HIKE & BIKE TRAIL (RE-BID); PROJECT NO: 09-18-C35-336.**

ARTICLE 2. CONTRACT DOCUMENTS

The Contract Documents consist of:

a. This Form of Agreement and all exhibits and attachments listed, contained or referenced in this Agreement;
b. Special Provisions
c. General Conditions of Contract for Engineering/Architectural Construction
d. Supplemental General Conditions of Contract for Engineering/Architectural Construction
~~e. Contract Provisions for Non-Federal Entity Contracts under Federal Awards~~
f. All Addenda issued before the Effective Date of this Agreement;
g. All Alternate Bids accepted by the Owner before the Effective Date of this Agreement;
h. All Change Orders issued after the Effective Date of this Agreement;
i. Drawings, Specifications, details and other documents developed by Owner and/or Project Architect to describe the Project and accepted by Owner
j. Drawings and Specifications developed or prepared by Owner's other consultants, if any, and accepted by Owner
k. Contractor's Bid. To the extent of any conflict between Contractor's Bid and any other Contract Document, the Contact Document shall govern.
l. Solicitation Documents.

The Contract Documents form the entire and integrated Contract between Owner and Contractor and supersede all prior negotiations, representations or agreements, written or oral.

FORM OF AGREEMENT continued:

ARTICLE 3. CONTRACT SUM

The Owner shall pay the Contractor for performance of the Contract, including the Base Bid and Alternate Bid, the sum of **_____ ($_____),** and make payment on account as provided in the General Conditions of Contract for Engineering/Architectural Construction.

ARTICLE 4. TIME OF COMPLETION

The Owner shall issue a Notice to Proceed identifying the date for commencement of the Work. The commencement date shall be ten (10) working days after the date the notice is issued. The Contractor shall achieve completion of the Work within _____ (____) working days after the commencement date, as such completion date may be extended by approved Change Orders.

ARTICLE 5. LIQUIDATED DAMAGES

The time set forth in the bid for the completion of the work is an essential element of the contract. For each consecutive working day after the expiration of the completion date set forth in the Notice to Proceed that any incomplete Work prevents or impairs the Owner's ability to operate and use the Project for its intended purposes, including the correction of deficiencies found during the final testing and inspection, the following amounts shall be deducted from the money due or that becomes due to the Contractor, not as a penalty, but as liquidated damages representing added expense for Engineering/Architectural supervision.

CONTRACT SUM	LIQUIDATED DAMAGES COST PER DAY
$5,000.00 to $25,000.00	$100.00
$25,001.00 to $100,000.00	$200.00
$100,001.00 to $500,000.00	$250.00
$500,001.00 and over	$300.00

ARTICLE 6. BONDS AND INSURANCE

The Contractor shall provide performance and payment bonds on forms prescribed by Owner and in accordance with the requirements set forth in the General Conditions of Contract for Engineering/Architectural Construction. The penal sum of the payment and performance bonds shall be equal to the Contract Sum.

The Contractor shall not commence work under the Agreement until it has obtained all insurance coverage as required by the General Conditions of Contract and until evidence of the required insurance has been reviewed and approved by the Owner. Owner's review of the insurance shall not relieve nor decrease the liability of the Contractor.

ARTICLE 7. CONTRACTOR'S SPECIAL WARRANTIES AND RESPONSIBILITIES

7.1 Contractor agrees and acknowledges that Owner is entering into this Agreement in reliance on Contractor's represented expertise and ability to provide construction services. Contractor agrees to use its best efforts, skill, judgment, and abilities to perform its obligations and to further the interests of Owner in accordance with Owner's requirements and procedures.

FORM OF AGREEMENT continued:

7.2 Contractor represents and agrees that it will perform its services in accordance with the usual and customary standards of Contractor's profession or business and in compliance with all applicable national, federal, state, and municipal, laws, regulations, codes, ordinances, orders and with those of any other body having jurisdiction over the Project.

7.3 Contractor agrees to bear the full cost of correcting Contractor's negligent or improper work and services, those of its consultants, and any harm caused by the negligent or improper work or services.

7.4 Contractor's duties shall not be diminished by any approval by Owner nor shall the Contractor be released from any liability by any approval by Owner, it being understood that the Owner is ultimately relying upon the Contractor's skill and knowledge in performing the services required by this Agreement.

7.5 Contractor represents and agrees that all persons connected with the Contractor directly in charge of its services are duly registered and/or licensed under the laws, rules and regulations of any authority having jurisdiction over the Project if registration is required.

7.6 Contractor represents and agrees to advise Owner of anything of any nature in any drawings, specifications, plans, sketches, instructions, information, requirements, procedures, and other data supplied to the Contractor (by the Owner or any other party) that is, in its opinion, unsuitable, improper, or inaccurate for the purposes for which the document or data is furnished.

7.7 The Contractor represents and agrees to perform its services under this Agreement in an expeditious and economical manner consistent with good business practices and the interests of Owner.

7.8 Contractor represents and agrees that there are no obligations, commitments, or impediments of any kind that will limit or prevent performance of its obligations under this Agreement.

7.9 Contractor represents and agrees that the individual executing this Agreement on behalf of Contractor has been duly authorized to act for and to bind Contractor to its terms.

7.10 Contractor shall designate a representative authorized to act on Contractor's behalf with respect to the Project.

7.11 Contractor shall establish and maintain a numbering and tracking system for all Project records including, but not limited to, changes, requests for information, submittals, and supplementary instructions and shall provide updated records to the Owner when requested.

7.12 Except for the obligation of Owner to pay Contractor certain fees, costs, and expenses pursuant to the terms of this Agreement, Owner shall have no liability to Contractor or to anyone claiming through or under Contractor by reason of the execution or performance of this Agreement. Notwithstanding any obligation or liability of Owner to Contractor, no present or future partner or affiliate of Owner or any agent, officer, director, employee, or City Official of Owner, or of the components comprising the City of McAllen, or anyone claiming under Owner has or shall have any personal liability to Contractor or to anyone claiming through or under Contractor by reason of the execution or performance of this Agreement.

FORM OF AGREEMENT continued:

ARTICLE 8. Party Representatives

8.1 The Owner's Designated Representative (ODR) authorized to act in the Owner's behalf with respect to the Project is:

Yvette Barrera, P.E. C.F.M. (ENGINEER/ARCHITECT)
City of McAllen, Engineering Department
[*Phone Number*]
[*Email Address*]

8.2 The Contractor's designated representative authorized to act on the Contractor's behalf and bind the Contractor with respect to the Project is:

[*Name*]
[*Title*]
[*Address*]
[*Phone Number*]
[*Email Address*]

8.3 The parties may make reasonable changes in their designated representatives upon advance written notice to the other party.

ARTICLE 9. NOTICES

Notices of claims or disputes or other legal notices required by this Agreement shall be sent to the following persons at the indicated locations.

If to Owner: Gerardo Noriega, CTPM, Director of Purchasing & Contracting
1300 Houston Avenue, Purchasing & Contracting Department
McAllen, Texas 78501
Mailing: P.O. Box 220, McAllen, TX 78505-0220
Email: gnoriega@mcallen.net
Fax No. (956) 681-1138

If to Contractor: [*Name*]
[*Company Name*]
[*Street Address*]
[*City, State, Zip*]
[*Fax No.*]

The parties may make reasonable changes in the person or place designated for receipt of notices upon advance written notice to the other party.

FORM OF AGREEMENT continued:

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

(Contractor)

(CORPORATE SEAL)

WITNESS:

_____

_____
LEGAL COMPANY NAME

By:_____
Signature

_____
Name and Title of Authorized Representative
(Type/Print)

CITY OF McALLEN
(Owner)

BY: _____
GERARDO NORIEGA, CTPM,
DIRECTOR PURCHASING & CONTRACTING

By: _____
ROEL "ROY" RODRIGUEZ, P.E.,
CITY MANAGER

P E R F O R M A N C E B O N D

STATUTORY PERFORMANCE BOND PURSUANT TO ARTICLE 2253
OF THE TEXAS LOCAL GOVERNMENT CODE AS AMENDED BY ACTS OF THE 1993,
73RD LEGISLATURE, CH. 268, § 1, EFF. SEPT. 1, 1993, AMENDED BY ACTS 1999, 76TH
LEGISLATURE, CH. 62, SECTION 8.20, EFF. SEPT. 1, 1999

****

KNOW ALL MEN BY THESE PRESENTS, THAT _____

_____

_____

(hereinafter called the Principal(s), as Principal(s), and _____

_____

_____

_____

(hereinafter called the Surety(s), as Surety(s), are held and firmly bound unto _____

_____

_____

_____

_____

(hereinafter called the Obligee), in the amount of _____

_____Dollars ($_____)

for the payment whereof the said Principal and Surety bind themselves, and their heirs,

administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated the

_____day of _____, 20_____, for the _____

_____

which contract is hereby referred to and made a part hereof as fully and to the same extent as if copies at length herein.

P E R F O R M A N C E B O N D Continued:

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform the work in accordance with plans, specifications and contract documents, during the original term of said contract and any extension thereof that may be granted by the City of McAllen with or without notice to the surety and during the life of any guaranty required under the contract, and shall also truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all authorized modifications of said contract that may hereafter be made, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Statutory Performance Bond Pursuant To Article 2253 of the Texas Local Government Code as Amended by Acts of the 1993, 73rd Legislature, Ch. 268, § 1, Eff. Sept. 1, 1993, Amended By Acts 1999, 76th Legislature, Ch. 62, Section 8.20, Eff. Sept. 1, 1999, and all liabilities on this bond shall be determined in accordance with the provisions of said Article to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, this instrument is executed in five counterparts, each one of which shall be deemed an original, this the _____ day of _____ A.D., 20____.

_____
Principal

ATTEST:

_____ _____
(Principal) Secretary Signature
(SEAL)

_____ _____
Witness as to Principal (Print/Type Name)

_____ _____
(Address) (Address)

ATTEST:

_____
Surety

_____ _____
(Surety) Secretary Attorney-in-Fact (Signature)
(SEAL)

_____ _____
Witness as to Surety (Print/Type Name)

_____ _____
(Address) (Address)

NOTE: Date of Bond must not be prior to date of Contract

(1) Correct name of Contractor; (2) A Corporation, a Partnership or an Individual, as case may be; (3) Correct name of Surety; (4) Correct name of Owner; (5) County or Parish and State; (6) Owner; (7) If Contractor is Partnership, all partners should execute bond.

P A Y M E N T B O N D

STATUTORY PAYMENT BOND PURSUANT TO ARTICLE 2253
OF THE TEXAS LOCAL GOVERNMENT CODE AS AMENDED BY ACTS OF THE 1993, 73RD LEGISLATURE, CH. 268, § 1, EFF. SEPT. 1, 1993, AMENDED BY ACTS 1999, 76TH LEGISLATURE, CH. 62, SECTION 8.20, EFF. SEPT. 1, 1999

****

KNOW ALL MEN BY THESE PRESENTS, that _____

_____

_____

_____

_____

(hereinafter called the Principal(s), as Principal(s), and _____

_____

_____

_____

_____

_____

(hereinafter called the Surety(s), as Surety(s), are held and firmly bond unto _____

_____

_____

_____

_____

_____

(hereinafter called the Obligee), in the amount of _____

_____Dollars ($_____)

for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated the _____ day of _____, 20_____, to which contract is hereby referred to and made a part hereof as fully and to the same extent as if copies at length herein.

P A Y M E N T B O N D Continued:

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay all claimants supplying labor and material to him or a subcontractor in the prosecution of the work provided for in said contract, and any extension thereof that may be granted by the City of McAllen with or without notice to the surety and during the life of any guaranty required under the contract, and shall also truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all authorized modifications of said contract that may hereafter be made, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Statutory Payment Bond Pursuant To Article 2253 of the Texas Local Government Code as Amended by Acts of the 1993, 73rd Legislature, Ch. 268, § 1, Eff. Sept. 1, 1993, Amended By Acts 1999, 76th Legislature, Ch. 62, Section 8.20, Eff. Sept. 1, 1999, and all liabilities on this bond shall be determined in accordance with the provisions of said Article to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, this instrument is executed in five counterparts, each one of which shall be deemed an original, this the _____ day of _____ A.D., 20_____.

	_____ Principal
ATTEST:	
_____ (Principal) Secretary (SEAL)	_____ Signature
_____ Witness as to Principal	_____ (Print/Type Name)
_____ (Address)	_____ (Address)
ATTEST: _____	_____ Surety
_____ (Surety) Secretary (SEAL)	_____ Attorney-in-Fact (Signature)
_____ Witness as to Surety	_____ (Print/Type Name)
_____ (Address)	_____ (Address)

NOTE: Date of Bond must not be prior to date of Contract

(1) Correct name of Contractor; (2) A Corporation, a Partnership or an Individual, as case may be; (3) Correct name of Surety; (4) Correct name of Owner; (5) County or Parish and State; (6) Owner; (7) If Contractor is Partnership, all partners should execute bond.

GENERAL CONDITIONS OF CONTRACT FOR ENGINEERING/ARCHITECTURAL CONSTRUCTION

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GENERAL CONDITIONS OF CONTRACT FOR ENGINEERING/ARCHITECTURAL CONSTRUCTION

SECTION 1. DEFINITIONS

1.1 The *Contract Documents* shall consist of Form of Agreement and all exhibits and attachments listed, contained or referenced in the Agreement; Special Provisions; General and Supplemental Conditions of Contract for Engineering/Architectural Construction; All Addenda issued before the Effective Date of the Agreement; All Alternate Bids accepted by the Owner before the Effective Date of the Agreement; All Change Orders issued after the Effective Date of the Agreement; Drawings, Specifications, details and other documents developed by Owner and/or Project Architect to describe the Project and accepted by Owner; Drawings and Specifications developed or prepared by Owner's other consultants, if any, and accepted by Owner; and Contractor's Bid.

1.2 The *Owner* shall represent the City of McAllen.

1.3 *Contractor* means the individual, corporation, limited liability company, partnership, firm, or other entity contracted to perform the Work, regardless of the type of construction contract used, so that the term as used herein includes general or prime Contractor. The Contract Documents refer to Contractor as if singular in number.

1.4 Wherever in this contract the word *"Engineer/Architect"* is used it shall be understood as referring to the Engineer/Architect of the Owner, acting personally or through assistants duly authorized in writing by the Engineer/Architect.

1.5 *Subcontractor* shall mean anyone (other than the Contractor) who furnished at the site, under an Agreement with the Contractor, labor, materials, or equipment, or a combination thereof, but shall not include any person who furnishes services of a personal nature.

1.6 *Work* shall mean the furnishing of all labor, materials, equipment, and other incidentals as are required to complete the Project for the purpose for which it was intended

1.7 *Dispute* shall mean lack of agreement between any parties that have any obligations, duties, or responsibilities under the terms of the contract, Drawings, or Specifications.

1.8 *Written notice* shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or to an authorized representative of such individual, firm, or corporation, or if delivered at or sent by registered mail to the last business address known to him who gives the notice, with a copy sent to the central office of the contractor.

SECTION 2. COPIES OF DRAWINGS FURNISHED

Unless otherwise provided in the Contract Documents, the Engineer/Architect will furnish to the Contractor, free of charge, all copies of Drawings and Specifications reasonably necessary for the execution of the work.

SECTION 3. ORDER OF COMPLETION

On the first day of every month in which any portion of the work is to be completed, and at such times thereafter as may be reasonably requested by the Owner's Representative, the Contractor shall submit schedules that show the order in which the Contractor proposes to carry out the work for the duration of the project and, in particular, for the current month, with dates at which the Contractor will start each portion or part of the work, specific estimated dates of completion of each portion or part of the work, and a detailed description of the specific portion or part of the work to be completed by the end of the current month.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 4. OWNER OF DRAWINGS

The City of McAllen shall be the owner of all drawings, specifications, and copies thereof furnished by the Engineer/Architect. Contractor shall not reuse the same on other work and sets are to be returned to Engineer/Architect at the completion of the work on request.

SECTION 5. FAMILIARITY WITH WORK

The Owner shall make known to all prospective bidders, prior to the receipt of bids, all information that Owner may have as to subsurface conditions in the vicinity of the work, topographical maps, or other information that might assist the bidder in properly evaluating the amount and character of the work that might be required. Such information is given, however, as being the best factual information available to the Owner. The Contractor shall carefully examine the nature and location of the work, the character of equipment and facilities needed preliminary to and during the prosecution of the work, general and local conditions, and all other matters which can in any way affect the work under the Contract.

SECTION 6. CHANGED CONDITIONS

Before project conditions are disturbed, the Contractor shall notify the Owner in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in this Contract; or (2) previously unknown physical or other conditions at the site of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract. The Owner's Representative shall promptly investigate the conditions, and if it is found that such conditions do so materially differ and cause an increase or decrease in the cost of, or the time required for, performance of this Contract, the Contractor shall submit a claim for an adjustment in compensation and/or time. Contractor must provide written notice to the Owner within seven (7) days after the Contractor knew, or reasonably should have known, of such changed condition(s). Any claim of the Contractor for an adjustment of compensation and/or time hereunder after the required notice period shall not be allowed or approved, and the Contractor waives all right to additional compensation or time. If the Contractor timely provides written notice in accordance with this Section 6 and the parties fail to agree upon the adjustment to be made, the dispute shall be determined as provided in Section 36 hereinafter.

SECTION 7. MATERIALS AND APPLIANCES

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation and other facilities necessary for the execution and completion of the work. Unless otherwise specified, all materials incorporated in the permanent work shall be new and both workmanship and materials shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials. Unless otherwise stipulated, the Owner will not pay for materials stored on hand.

SECTION 8. EMPLOYEES

8.1 Neither the Contractor nor his/her employees engaged in fulfilling the terms and conditions of the awarded Construction Contract shall be considered employees of the Owner.

8.2 The Contractor shall at all times enforce strict discipline and good order among his employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned to him. The Owner shall have the authority to request that Contractor remove any objectionable employee from project site.

8.3 Adequate sanitary facilities shall be provided by the Contractor.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 9. ROYALTIES AND PATENTS

9.1 The Contractor shall hold and save the owner and its officers, agents, servants and employees, harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in the performance of the contract, including its use by the Owner.

9.2 *License or Royalty Fee:* License and/or royalty fees for the use of a process which is authorized by the Owner of the project must be reasonable, and paid to the holder of the patent, or his/her authorized licensee, directly by the Contractor. If the Contractor uses any design, device or materials covered by letters, patent or copyright, he/she shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood that, without exception, the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his/her Sureties shall indemnify and hold harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

SECTION 10. SURVEYS

10.1 Unless otherwise specified, the Owner shall furnish all land surveys and establish all base lines for locating the principal component parts of the work together with a suitable number of bench marks adjacent to the work. From the information provided by the Owner, the Contractor shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations, and other working points, lines and elevations.

10.2 The contractor shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

SECTION 11. PERMITS, LICENSES AND REGULATIONS

Permits and licenses of a temporary nature necessary for the prosecution and completion of the work shall be secured and paid for by the Contractor. Permits, licenses, and easements of a permanent nature that will be required after the completion of the project will be secured and paid for by the Owner, unless otherwise specified. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the Drawings and Specifications are at variance therewith, Contractor shall promptly notify the Engineer/Architect in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work.

SECTION 12. PROTECTION OF THE PUBLIC AND OF WORK AND PROPERTY

12.1 The Contractor shall provide and maintain all necessary watchmen, barricades, warning lights and signs and take all necessary precautions for the protection, and safety of the public. Contractor shall take all reasonable precautions to protect the Owner's property from injury or loss arising in connection with this contract. Contractor shall make good any damage, injury or loss to his work and to the property of the Owner resulting from lack of reasonable protective precautions, except such as resulting from lack of reasonable protective precautions, except such as may be due to errors in the Contract Documents, or caused by agents or employees of the Owner. Contractor shall adequately protect adjacent private and public property, as provided by law and the Contract Documents.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 12. PROTECTION OF THE PUBLIC AND OF WORK AND PROPERTY continued:

12.2 In an emergency affecting the safety of life, work, or of adjoining property, the Contractor is hereby permitted to act at Contractor's discretion to prevent such threatened loss or injury. Contractor shall act without special instructions or authorization from the Engineer/Architect and without appeal, if so authorized or instructed by the Engineer/Architect.

12.3 Any compensation claimed by the Contractor on account of emergency work, shall be determined by agreement, litigation or arbitration.

SECTION 13. INSPECTION OF WORK

13.1 The Owner shall provide sufficient competent personnel, under the supervision of a qualified Engineer/Architect, for the inspection of the work while such work is in progress to ascertain that the completed work will comply in all respects with the standards and requirements set forth in the Specifications. Notwithstanding such inspection, the Contractor will be held responsible for the acceptability of the finished work.

13.2 The Engineer/Architect and his representatives shall at all times have access to the work whenever it is in preparation and/or progress, and the Contractor shall provide proper facilities for such access and inspection.

13.3 If the Specifications, the Engineer's/Architect's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Engineer/Architect timely notice of its readiness for inspection, and scheduled date of such inspection if the inspection is by an authority other than the Engineer/Architect. Inspections by the Engineer/Architect shall be made promptly and at the source of supply, where practicable. If any work should be covered up without approval or consent of the Engineer/Architect, it must be uncovered if required by the Engineer/Architect at the Contractor's expense, unless the Engineer/Architect has unreasonably delayed inspection.

13.4 Re-examination of the work may be ordered by the Engineer/Architect and if so ordered, the work must be uncovered by the Contractor. If such work is found to be in accordance with the Contract Documents, the Owner shall pay the cost of re-examination and replacement. If such work is not in accordance with the Contract Documents, the Contractor shall pay such cost.

SECTION 14. SUPERINTENDENCE

The Contractor shall keep a competent superintendent and any necessary assistants on the project site throughout the duration of the work. The superintendent shall represent the Contractor and all directives given to superintendent shall be binding as if given to the Contractor. Directives shall immediately be confirmed in writing to the Contractor. The Contractor shall give efficient superintendence to the work using best skill and attention.

SECTION 15. DISCREPANCIES

If in the course of the work, the Contractor finds any discrepancy between the Drawings and the physical conditions of the locality, or any errors or omissions in Drawings or in the layout as given by survey points and instructions, Contractor shall immediately inform the Engineer/Architect in writing, and the Engineer/Architect shall promptly verify the same. Any work done by Contractor after such discovery without prior authorization will be done at the Contractor's risk.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 16. CHANGES IN THE WORK

16.1 The Owner may make changes to the contract drawings and specifications at any time by a written order. Changes shall be within the general scope of work and reasonable for the completion of the project scope. If such changes add to or deduct from the contractor's cost of the work, the Contract Sum shall be adjusted accordingly. All such changes in the work shall be executed under the conditions of the original Contract in at mutually agreed-upon unit price and through approved Change Orders, except that any claim for extension of time or additional compensation caused thereby shall be adjusted only at the time of ordering such change. Changes to work shall be in accordance to Texas Local Government Code Chapter 252.

16.2 The Engineer/Architect shall have authority to give directives and make minor changes in the work only to the extent that the work does not involve additional cost and changes are consistent with the purposes of the work.

16.3 Except as provided for in Section 12, no extra work or change shall be made unless in pursuance of a written order by the Engineer/Architect, and no claim for additional compensation to the Contract Sum shall be valid unless the additional work was so ordered.

16.3 The Contractor shall proceed with the work as changed and the value of any changes in work or change shall be determined as provided in the Agreement. The Contractor's acceptance of any written order(s) for changes in the work constitutes the Contractor's acknowledgement that all extensions, increases or deductions of time and/or compensation, and claims and disputes related to the subject of the written order(s) have been or were resolved by the written order(s). By accepting the written order(s) for changes in the work, the Contractor waives and releases any and all claims and causes of action, including, but not limited to, claims for additional compensation or extensions of time, related to or arising from any work added to, deducted from, or affected by the written order(s).

SECTION 17. EXTENSION OF TIME

17.1 Extension of time for completion of the Work may be granted by the Owner by means of a change order and shall apply in the following instances:

a. changes in the work, as provided in Section 16;
b. when work is suspended as provided in Section 21;
c. when Contractor's performance of the work is delayed on account of conditions which could not have been foreseen, or which were beyond the control of the Contractor, his Subcontractors or suppliers, and which were not the result of their fault or negligence.
d. neglect of the Owner or of his employees or by other contractors employed by the Owner, or by any delay in the furnishing of Drawings and necessary information by the Engineer/Architect;
e. or by any other cause which in the opinion of the Engineer/Architect entitled the Contractor to an extension of time, including but not restricted to, acts of the public enemy, acts of any government in either its sovereign or any applicable contractual capacity, acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, freight embargoes, usually severe weather, or labor disputes.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 17. EXTENSION OF TIME continued:

17.2 The Contractor shall notify the Owner's Representative in writing within seven (7) working days of any occurrence or conditions which describes in detail the Contractor's claim to an extension of time. Such notice shall permit full investigation and evaluation of the contractor's claim. The Engineer/Architect shall acknowledge receipt of the Contractor's notice within five (5) working days of its receipt. Contractor's failure to provide such notice shall constitute a waiver by the Contractor of any claim.

SECTION 18. CLAIMS

If the Contractor claims that any directives issued after the date of the Contract, either by Drawings or other means, involve additional cost under the Contract, Contractor shall give the Engineer/Architect written notice thereof within seven (7) working days after the receipt of such instructions, and in any event before proceeding to execute the work, except as provided for in Section 12. No such claim shall be valid unless so made.

SECTION 19. DEDUCTIONS FOR UNCORRECTED WORK

If the Engineer/Architect deems it inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made thereof, unless the Contractor elects to correct to work.

SECTION 20. CORRECTION OF WORK BEFORE FINAL PAYMENT

20.1 The Contractor shall promptly remove from the premises all materials and work rejected by the Engineer/Architect due to failing to meet Contract requirements, whether incorporated in the work or not. The Contractor shall promptly replace and re-execute the work in accordance with the Contract and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

20.2 If the Contractor does not take action to remove such rejected materials and work within ten (10) working days after written notice, the Owner may remove such rejected materials and may store the material at the expense of the Contractor. If the Contractor does not pay the expense of such removal and storage within ten (10) working days' time thereafter, the Owner may, upon ten (10) working days' written notice, sell such materials at auction or private sale and shall pay to the Contractor any net proceeds thereof after deducting all the costs and expenses that should have been borne by the Contractor.

SECTION 21. SUSPENSION OF WORK

21.1 The Owner may at any time suspend the work, or any part thereof by giving one (1) day written notice to the Contractor. The work shall be resumed by the Contractor within ten (10) working days after the date of the written notice from the Owner to the Contractor so to do. The Owner may reimburse the Contractor for expense incurred by the Contractor in connection with the work under this Contract as a result of such suspension; eligibility and amount of disbursement shall be determined by the Engineer/Architect.

21.2 If the work, or any part thereof, shall be suspended by written notice by Owner and if the Owner does not give written notice to the Contractor to resume work within fifteen (15) working days of the notice to suspend, then the Contractor may abandon that portion of the work and Contractor shall be entitled to the estimates and payments for all work done on the portions so abandoned, if any; Contractor is not entitled to any compensation for loss of overhead, plant expense, and anticipated profit.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 22. CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

If the work should be stopped under an order of any court, or other public authority, for a period of more than three (3) months, through no act or fault of the Contractor or of anyone employed by Contractor, or if the Engineer/Architect should fail to issue any estimate for payment within seven (7) working days after it is due, then the Contractor, may, upon seven (7) working days' written notice to the Owner's Representative, stop work or terminate this Contract and recover from the Owner payment for all work executed.

SECTION 23. THE OWNER'S RIGHT TO TERMINATE CONTRACT

If the Contractor is adjudged as bankrupt, or if Contractor makes a general assignment for the benefit of its creditors, or if a receiver is appointed as a result of Contractor's insolvency, or if Contractor is guilty of a substantial violation of the Contract, then the Owner, upon the certificate of the Engineer/Architect that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy terminate the Contract with the Contractor, after giving the Contractor and his Surety seven (7) working days' written notice, and take possession of the premises and of all materials, tools, equipment and other facilities installed on the work and paid for by the Owner, and finish the work by whatever method Owner may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract price shall exceed the expense of finishing the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If the expense of finishing the work shall exceed such unpaid balance to the Contractor, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner as herein provided and the damage incurred through the Contractor's default, shall be certified by the Engineer/Architect.

SECTION 24. REMOVAL OF EQUIPMENT

In the case of termination of the Contract for any cause before the completion of the work, the Contractor, if notified to do so by the Owner, shall promptly remove any part or all of his equipment and supplies from the Owner's property. If Contractor fails to do so, the Owner shall have the right to remove such equipment and supplies at the expense of the Contractor.

SECTION 25. RESPONSIBILITY FOR WORK

25.1 The Contractor assumes full responsibility for the work. Until its final acceptance, the Contractor shall be responsible for damage to or destruction of the work (except for any part covered by partial acceptance as set forth in Section 26). Contractor agrees to make no claims against the Owner for damages to the work from any cause (except negligence or willful acts of the Owner), acts of an enemy, acts of war, or as provided for in Section 32.

25.2 Existing Structures: The Contractor shall, at Contractor's expense, immediately make permanent repairs and restore to original condition any and all utility lines, irrigation lines, pipe lines, pavement, or structures that are to remain in place and damaged by the Contractor's equipment or workmen during the performance of work under this contract, or damaged as a result of improperly executed work.

25.3 Traffic Areas, Driveways, Entrances: All traffic areas, driveways and entrances shall be restored to usable condition at the Contractor's expense as the work progresses. The Contractor shall make every effort to cooperate with the wishes of the individual property owners in providing access to private property along the site of the work.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 25. RESPONSIBILITY FOR WORK continued:

25.4 Detours: The Contractor shall do such work as may be necessary to provide and maintain a detour adjacent to all road structures for public travel. The Contractor shall maintain the detours in such condition that the public can travel over same in comfort and safety, and shall at his own expense perform such work as may be required to keep said detours open to the public at all times. The Contractor shall cooperate with the Engineer/Architect in the regulation of traffic and Contractor shall govern its work that when it becomes necessary to suspend construction for a considerable period of time, the roadways will be re-opened to public travel. Materials and equipment shall be stored and the work shall be so conducted as to obstruct public travel as little as possible, and in no case shall there be less than twenty (20) feet in width of unobstructed roadway for the use of traffic. Materials and equipment stored in or near the path of traffic shall be protected with applicable traffic control devices in compliance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

25.5 Traffic Control Devices: When any section of the contraction site is closed to traffic, the Contractor shall furnish and maintain at each end of the closed section and at all intersecting streets - roads - construction site within the section, standard barricades, adequate warning signs and directional signs. All lights shall be kept burning from sunset to sunrise. If at any time the barricades are not, in the opinion of the Engineer/Architect, sufficient to prevent traffic from entering the closed portions of the street-road-construction site, the Contractor shall provide and maintain watchmen at such points and for such periods of time as the Engineer/Architect may direct. When directed by the Engineer/Architect, the Contractor shall provide and maintain such standard barricades, signs, lights and flags within the closed portion of the street-road-construction site as may be necessary to protect the work and safeguard local traffic.

25.6 No direct compensation, except as specifically provided in these specifications, will be made to the Contractor for the work and material involved in constructing and maintaining detours and approaches; furnishing, installing and maintaining barricades, danger, warning, and necessary for the proper direction, safety, and convenience of traffic during the Contract period, as this work is to be considered subsidiary to the several items for which unit prices are requested in the bid.

SECTION 26. PARTIAL COMPLETION AND ACCEPTANCE

If at any time prior to the issuance of the final payment, referred to in Section 40 hereinafter, any portion of the permanent construction has been satisfactorily completed, and if the Engineer/Architect determines that such portion of the permanent construction is not required for the operations of the Contractor but is needed by the Owner, the Engineer/Architect shall issue to the Contractor a certificate of partial completion, and thereupon or at any time thereafter the Owner may take over and use the portion of the permanent construction described in such certificate, and exclude the Contractor therefrom. The issuance of a certificate of partial completion shall not be constructed to constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates if he has failed to complete it in accordance with the terms of this contract. The issuance of such a certificate shall not operate to release the Contractor or his sureties from any obligations under this contract or the performance bond. If any prior use increases the cost of or delays the work, the Contractor shall be entitled to extra compensation, or extension of time, or both, as the Engineer/Architect may determine, unless otherwise provided.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 27. PAYMENTS WITHHELD PRIOR TO FINAL ACCEPTANCE OF WORK

27.1 The Owner, as a result of subsequently discovered evidence, may withhold or nullify the whole or part of any payment certificate to such extent as may be necessary to protect himself from loss caused by:

(a) Defective work not remedied.
(b) Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor.
(c) Failure of the Contractor to make payments properly to Subcontractors or for material or labor.
(d) Damage to another contractor.
(e) Claims filed or reasonable evidence indicating probable filing of claims by Contractor against Owner.

27.2 No money may be withheld under (b) and (c) above if a payment bond is included in the Contract.

SECTION 28. CONTRACTOR'S INSURANCE REQUIREMENTS

During execution of Contracts, the successful Contractor shall provide a Certificate of Insurance made to the City of McAllen, P.O. Box 220, McAllen, TX 78505-0220, (1300 Houston, McAllen, Texas 78501) and should reference the project number and project Name. The prime contractor shall ensure that any and all subcontractors and/or lower-tier subcontractors comply with the insurance requirements as depicted herein. Such coverage(s) shall be acquired and maintained for the duration of the contract period.

All certificates must be received prior to commencement of service/work. All Certificates of insurance shall be approved by the Risk Manager and/or his/her designated representative **prior** to the commencement of any work.

In the event the insurance coverage expires prior to the completion of the executed contract, a renewal certificate shall be issued thirty (30) days prior to said expiration date. The City must be notified at least thirty (30) days prior to any material change in and/or cancellation and/or non-renewals of such policies.

The term "City" shall include The City of McAllen and/or McAllen Public Utilities (MPU) and their employees, officers, officials, agent, and volunteers in respect to the contracted services. Any failure on the part of the City to request required insurance documentation shall not constitute a waiver of the insurance requirement.

The City reserves the right to make reasonable requests or revisions pertaining to the types and limits of that coverage.

During the term of the Contract, the successful contractor/respondent/selected firm shall acquire and maintain, for the duration of the contract period the following insurances:

A. **Comprehensive Commercial General Liability**: The Contractor/Respondent/Selected Firm shall provide minimum limits of $250,000 each occurrence, $500,000 annual aggregate combined single limit for bodily injury and property damage liability. This shall include premises/operations, independent contractors, products, completed operations, personal and advertising injury, and contractual liability. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance programs maintained by the City and shall name the "City of McAllen" as an additional insured with a waiver of subrogation. The policy of insurance shall be written on an "occurrence" form.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 28. CONTRACTOR'S INSURANCE REQUIREMENTS continued:

A. **Comprehensive Commercial General Liability continued:**

Blanket "XCU" – Explosion, Collapse & Underground
Independent Contractors
Care, Custody and Control
Contractual Liability

No endorsements excluding these coverages are allowed.

Additional Insured Requirement:
To the fullest extent of coverage allowed under Chapter 151 of the Texas Insurance Code, the City of McAllen and/or McAllen Public Utilities (MPU) shall be included as additional insured under the CGL policy, using ISO Additional Insured Endorsements CG20101001 and CG20371001, or endorsements providing equivalent coverage, including products completed operations

B. **Business Automobile Liability:** The Contractor/Respondent/Selected Firm shall maintain limits of no less than $250,000 combined single limit per occurrence for bodily injury and property damage, and $500,000 annual aggregate. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance programs maintained by the City and shall name the "City of McAllen" as an additional insured with a waiver of subrogation. The policy of insurance shall be written on an "occurrence" form.

Applicable as long as no fragile or perishable products are transported; otherwise, Cargo Insurance is required.

Additional Insured Requirement:
To the fullest extent of coverage allowed under Chapter 151 of the Texas Insurance Code, the City of McAllen and/or McAllen Public Utilities (MPU) shall be included as additional insured under the CGL policy, using ISO Additional Insured Endorsements CG20101001 and CG20371001, or endorsements providing equivalent coverage, including products completed operations

C. Builder's Risk/Fire & Extended Coverage
The Contractor shall insure the building or other work included in this contract on an all-risk (special causes of loss) policy, with an insurance company or companies acceptable to the Owner. The amount of the insurance at all times to be at least equal to the amount paid on account of work and material and plus the value of the work or materials furnished or delivered but not yet paid for by the Owner. Builder's Risk Policies shall cover loss of materials by theft, vandalism, malicious mischief or other loss whether materials are incorporated in the work or not.

The policies shall be in the names of the City and the Contractor, as their interests may appear, and certificates of insurance shall be delivered to the Owner before monthly partial payments are made. The policy shall provide for the inclusion of names of all other contractors, subcontractors and other employed on the premises as ensured and shall stipulate that the insurance companies shall have no right to subrogation against any contractors, subcontractors or other parties employed on the premises for any work building alterations, construction or erection to the described property.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 28. CONTRACTOR'S INSURANCE REQUIREMENTS continued:

D. **Workers' Compensation:** The contractor/respondent/selected firm shall provide and maintain workers' compensation insurance for all employees in the full amount required by statute and full compliance with the applicable laws of the State of Texas. Employer's Liability insurance shall be provided in amounts not less than $500,000 per accident for bodily injury by accident; $500,000 policy limit by disease; and $500,000 per employee for bodily injury by disease."

In addition, a Waiver of Subrogation Endorsement shall be provided by the contractor naming the City of McAllen in said policy for Worker's Compensation Insurance. Contractor/Respondent/Selected Firm shall further ensure that all of its sub-contractors maintain appropriate levels of workers' compensation insurance.

E. **Professional Services - Insurance Provisions:** Errors & Omissions (Professional Liability): $1,000,000 Each Claim Limit $1,000,000 Aggregate Limit. If coverage is written on a claims-made basis, the retroactive date shall be on or prior to the date of the contractual Agreement. The certificate of insurance shall state that the coverage is claims-made and include the retroactive date. The insurance shall be maintained for the duration of the contractual Agreement and for four (4) years following completion of the services provides under the contractual Agreement or for the warranty period, whichever is longer. An annual certificate of insurance submitted to the City shall evidence coverage.

F. **Deductible Clause:** Contractor/Respondent/Selected Firm to declare self-insured retention or deductible amounts in excess of $25,000.

G. **Other Provisions:** All insurance carriers shall be rated A6 or better and be published on a current A.M. Best Rating Guide, or some other recognized equivalent rating service (e.g., Moody's, Standard & Poor's). The City may request a copy of the insurance policy according to the nature of the project. City reserves the right to accept or reject the insurance carrier. All Certificates of Insurance shall be provided on the Acord Form 25. All insurance requirements are imposed and must be complied with by any and all sub-contractors, and/or lower-tier sub-contractors. A copy of endorsements providing Additional Insured, Primary Insurance and Waiver of Subrogation wording shall be attached to the certificates of insurance.

SECTION 29. PAYMENT AND PERFORMANCE BONDS

The Owner shall have the right, prior to the signing of the Contract, to require the Contractor to furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder, in such form as the Owner may prescribe in the bidding documents and executed by one or more financially responsible sureties. If such bonds are required, the premium shall be paid by the Contractor. The Owner may require additional bond if the contract is increased appreciably.

SECTION 30. ASSIGNMENT

Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any moneys due to Contractor or to become due to Contractor hereunder, except to bank or financial institution acceptable to the Owner.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 31. RIGHTS OF VARIOUS INTERESTS

If work by the Owner's or Contractor's forces is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Engineer/Architect to secure the completion of the various portions of the work in general harmony.

SECTION 32. SEPARATE CONTRACTS

32.1 The Owner reserves the right to permit other contracts in connection with the project. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate Contractor's work with other contracted parties. The parties agree that the Owner shall not be responsible or liable for any delays in Contractor's progress or completion of the work that are caused, in whole or in part, by the acts or omissions of other contractors, subcontractors, or third parties.

32.2 If the proper execution or results of any part of the Contractor's work depends upon the work of any other contract, the Contractor shall inspect and promptly report to the Engineer/Architect any defects in such work that render it unsuitable for such proper execution and results.

SECTION 33. SUBCONTRACTS

33.1 The Contractor shall, as soon as practical after signing of the Contract, notify the Engineer/Architect in writing of the names of Subcontractors proposed for the work.

33.2 The Contractor shall be fully responsible to the Owner for the acts and omissions of its Subcontractors and of persons either directly or indirectly employed by them.

33.3 Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the Owner.

SECTION 34. ENGINEER'S/ARCHITECT'S STATUS

The Engineer/Architect shall perform technical observation of the work. Engineer/Architect has authority to stop and suspend the work as may be necessary to insure the proper execution of the contract. Engineer/Architect shall also have authority to reject all work and materials which do not conform to the Contract and to decide questions which arise in the execution of the work.

SECTION 35. ENGINEER'S/ARCHITECT'S DECISION

The Engineer/Architect shall, within a reasonable time after having received proper notification, make decisions in writing on all claims of the Owner or the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the Contract Documents.

SECTION 36. JURISDICTION AND VENUE; MEDIATION, LITIGATION AND ARBITRATION

36.1 As a condition precedent to any suit or arbitration being filed or initiated, any controversy or claim arising out of or relating to this contract, or the breach thereof, is subject to mandatory mediation to take place in Hidalgo County, Texas at a time agreed upon by the parties. Such mediation must be held within thirty (30) days after the date either party requests mediation, unless otherwise agreed.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 36. JURISDICTION AND VENUE; MEDIATION, LITIGATION AND ARBITRATION continued:

36.2 The Parties agree that any dispute arising out of or related to this Contract would likely involve an inquiry and interpretation of a substantial federal issue. Accordingly, the parties further agree that, if such mediation is unsuccessful, the proper and exclusive forum and venue in all legal actions brought to enforce or construe any of the provisions of this Contract shall be in the United States District Court for the Southern District of Texas, McAllen Division. The Owner and Contractor agree and stipulate that the United States District Court for the Southern District of Texas, McAllen Division, has personal jurisdiction over the parties. However, if federal subject matter jurisdiction is found to be lacking in any legal action, or if a federal court otherwise refuses or fails to exercise jurisdiction over the parties or the dispute, the Parties agree to submit any dispute arising out of or related to this Contract to binding arbitration pursuant to the Texas General Arbitration Act, Chapter 171 of the Texas Civil Practice and Remedies Code ("TAA") and the terms of this Section 36. To the extent that TAA and this Section 36 conflict, the provisions of this Section 36 will apply.

36.3 The parties will select a single arbitrator in accordance with the rules of the American Arbitration Association. The parties further agree that all depositions in any arbitration shall be limited to a total of 24 hours for each party. The parties further agree that the parties shall not serve interrogatories or requests for admission on the other party. The parties further agree that the parties will instruct the Arbitrator, and the Arbitrator is required, to follow the substantive law of the State of Texas and to issue a reasoned award with findings of fact and conclusions of law. **The Arbitrator does not have authority to render a decision which contains a reversible error of state or federal law; the Arbitrator exceeds the Arbitrator's powers if the Arbitrator renders a decision which contains a reversible error of state or federal law.** The parties further agree that a court reporter shall be present and keep a record of all hearings, which shall be conducted in Hidalgo County, Texas, and the cost of which will be divided equally among the parties notwithstanding any final award entered by the Arbitrator.

36.4 The parties further agree that the award of the Arbitrator may be reviewed based on the record by a state district court having jurisdiction over the parties and the subject matter and that, notwithstanding the applicability of the TAA, such district court shall conduct a *de novo* review of the award of the Arbitrator and consider any improper application of the law, and/or abuse of discretion by the Arbitrator, in considering the award of the Arbitrator and determining whether to confirm, vacate or modify the award of the Arbitrator. The parties further agree that any judgment or final order entered by the district court is subject to further appellate review consistent with applicable rules of appellate procedure that otherwise would be followed upon a judgment or final order being issued by such District Court.

SECTION 37. COORDINATION WITH OTHER PARTIES

The Contractor shall coordinate the Contractor's schedule with the schedule, work, labor, materials and/or equipment provided by all other contractors, subcontractors, manufacturers and suppliers to ensure timely completion of the project. The Contractor shall be responsible for reducing, mitigating, eliminating or limiting any delays or damages caused, in whole or in part, by all other contractors, subcontractors, manufacturers, suppliers and any other third parties, including, but not limited to, delays or damages caused by a lack of access to the lands upon which the work under the Contract is to be done. The parties agree that the Owner is not liable for any delays or damages caused, in whole or in part, by any other contractors, subcontractors, manufacturers, suppliers and/or any other third parties. The Contractor shall provide at his own expense and without liability to the Owner any land and access thereto that may be required for temporary construction facilities, or for storage of material.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 38. LAND FOR WORK

38.1 The Owner shall provide as indicated on Drawings, and not later than the date when needed by the Contractor, the lands upon which the work under this Contract is to be done, right-of-ways for access to same, and such other lands which are designated on the Drawings for the use of the Contractor. Such lands and right-of-ways shall be adequate for the performance of the Contract. Any delay in the furnishing of these lands by the Owner shall be deemed proper cause for an equitable adjustment in both Contract price and time of completion.

38.2 The Contractor shall provide at his own expense and without liability to the Owner any additional land and access thereto that may be required for temporary construction facilities, or for storage of material.

SECTION 39. CLEANING UP

The Contractor shall remove from the Owner's property and from all public and private property all temporary structures, rubbish and waste materials resulting from Contractor's operations, at Contractor's expense. This requirement shall not apply to property used for permanent disposal of rubbish or waste, and materials in accordance with permission granted of such disposal to the Contractor by the Owner thereof.

SECTION 40. ACCEPTANCE AND FINAL PAYMENT

40.1 Upon receipt of written notice that the work is substantially completed or ready for final inspection and acceptance, the Engineer/Architect will promptly make such inspection, if Engineer/Architect finds the work acceptable under the Contract, and Contract fully performed, or substantially completed, Engineer/Architect shall promptly issue a signed certificate stating that the work required by this Contract has been completed or substantially completed and is accepted by Engineer/Architect under the terms and conditions thereof. The certificate shall contain the entire balance found to be due and payable to the Contractor, including the retained percentage, less a retention based on the Engineer's/Architect's estimate of the fair value of the claims against the Contractor and the cost of completing the incomplete or unsatisfactory items of work with specified amounts for each incomplete or defective item of work. The date of substantial completion of a project or specified area of a project is the date when the construction is sufficiently completed in accordance with the Contract Documents as modified by any change orders agreed to by the parties so that the Owner can occupy the project for the use for which it was intended.

40.2 Before issuance of final payment, the Contractor, if required in the Special Conditions, shall certify in writing to the Engineer/Architect that all payrolls, material bills, and other indebtedness or liens, with the work have been paid, or otherwise satisfied, except that in case of disputed indebtedness or liens, if the Contract does not include a payment of all such disputed amounts, including all related costs and interest in connection with said disputed indebtedness or lien which the Owner may be compelled to pay upon adjudication.

40.3 The making and acceptance of the final payment shall constitute a waiver of all claims by the Owner, other than those arising from unsettled liens, from faulty work appearing within a one year guarantee period from date of acceptance, from the requirements of the Drawings and Specifications, or from the manufacturer's guarantees. It shall also constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 40. ACCEPTANCE AND FINAL PAYMENT continued:

40.4 In the event that the Contractor has previously made a claim that is still unsettled, the Owner shall be entitled to withhold from the final payment, as an offset, any amounts that the Owner, in its sole discretion, believes that the Contractor may owe to the Owner for liquidated damages or for the Contractor's failure to timely complete the project. Notwithstanding anything to the contrary herein, the Owner shall not be liable, in any event, for any interest that accrues on any amount(s) withheld from the final payment, as an offset, that the Owner, in its sole discretion, believes that the Contractor may owe to the Owner for liquidated damages or for the Contractor's failure to timely complete the project.

40.5 If after the work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor's and the Engineer/Architect so certified, the Owner shall, upon certificate of the Engineer/Architect, and without terminating the contract, make payment of the balance due for that portion of the work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

40.6 Payments shall be in accordance with Texas Government Code § 2251. The Owner shall not be responsible for paying any interest on any amounts withheld from any progress payments or from final payment that the Owner, in its sole discretion, believes that the Contractor may owe to the Owner for liquidated damages or for the Contractor's failure to timely complete the project.

40.7 Contractor is advised that it shall be a requirement of this contract to submit the following forms, properly executed, along with their final Request for Payment: "AFFIDAVIT AND WAIVER OF LIEN-PRIME CONTRACTOR", "RELEASE AND WAIVER OF CLAIMS BY SUBCONTRACTORS AND PRODUCT VENDORS", "CONTRACTOR'S AFFIDAVIT AS TO STATUS OF LIENS". **Failure to submit these forms as required will cause a delay in payment to the contractor.**

SECTION 41. GENERAL GUARANTY

41.1 Neither the final certificate of payment nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall guarantee all materials and equipment furnished and Work performed for a period of one (1) year from the date of Substantial Completion. The Contractor warrants and guarantees for a period of one (1) year from the date of Final Acceptance of the system that the completed system is free from all defects due to faulty materials or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system or other work resulting from such defects.

SECTION 41. GENERAL GUARANTY continued:

41.2 The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments, or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 42. SHOP DRAWINGS

The approval of shop drawings by the Engineer/Architect shall not be construed as a complete check, but will indicate only that the general method of construction and detailing is satisfactory. Approval of such drawings will not relieve the Contractor of the responsibility for any error which may exist as the Contractor shall be responsible for the dimensions and design of adequate connections, details and satisfactory construction of all work.

SECTION 43. TESTING

All testing authorized by the Engineer/Architect that meets specification requirements will be paid for by the Owner. Tests on materials that fail will be billed to and paid for by the Contractor.

SECTION 44. PAYMENTS

44.1 Payments shall be in accordance with Texas Government Code § 2251.

44.2 Contractor shall submit to the Owner a Certificate for Payment on or before the 1st of the month.

44.3 The Owner shall pay to the Contractor for the performance of the work the amounts determined for the total number of each of the units of work completed at the unit price stated thereafter. The total number of units contained in the schedule is approximate only, and the final payment shall be made for the actual number of units that are incorporated in or made necessary by the work covered by the contract.

SECTION 45. PROGRESS PAYMENTS

The owner shall make payments on account of the Contract as follows:

45.1 On not later than the first day of every month the Contractor shall present to the Engineer/Architect a Certificate for Payment covering the total quantities under each item of work that has been completed from the start of the job to and including the last day of the preceding month, and the value of the work so completed determined in accordance with the schedule of unit prices for such items together with such supporting evidence as may be required by the Engineer/Architect.

45.2 Measurements of units for payment shall be made in accordance with the Special Conditions of the contract.

45.3 Owner's duty to pay shall be after receipt of complete certificate for payment certified by Engineer/Architect. Owner shall pay by mail to the Contractor (___%) of the amount of the invoice--less previous payments made. The (__%) retained percentage may be held by the Owner until the value of the work completed at the end of any month equals 50 percent of the total amount of the Contract after which, if the Engineer/Architect finds that satisfactory progress is being made, recommendation shall be that all of the remaining monthly payments be paid at a percentage of retainage less than stated above. Payments for work under subcontracts of the Contractor, shall be subject to the above conditions applying to the Contract after the work under a Subcontract has been 50 percent completed.

45.4 For purposes of Tex. Gov't Code § 2251.021(a)(2), the date the performance of service is complete is the date when ODR approves the Application for Payment.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 46. RETAINAGE

Contracts equaling a total amount of $400,000.00 or over will bear a retainage of five percent (5%) on each partial disbursement. Contracts totaling less than $400,000.00 will bear a retainage of ten percent (10%) on each partial disbursement.

SECTION 47. OVERTIME

Contractor shall pay its employees performing work under the contract time and one half for all hours worked in excess of forty (40) hours in one work week.

SECTION 48. RIGHT TO AUDIT

The Owner reserves the right to audit the Contractor's books and records relating to the performance of the contract. The Owner, at its own expense, shall have the right at all reasonable times during normal business hours and upon at least twenty-four (24) hours' advance notice, to audit, examine, and make copies of or extracts from the books of account and records maintained by the Contractor with respect to the Construction Contract. If such audit shall disclose overpayment by Owner to Contractor, written notice of such overpayment shall be provided to the Contractor and the amount of overpayment shall be promptly reimbursed by Contractor to the Owner. In the event any such overpayment is not paid within ten (10) business days after receipt of such notice, the unpaid amount of such overpayment shall bear interest at the rate of one percent (1%) per month from the date of such notice until paid.

SECTION 49. INDEMNITY AND HOLD HARMLESS AGREEMENT

TO THE FULLEST EXTENT PERMITTED BY LAW, THE CONTRACTOR WILL DEFEND, INDEMNIFY AND HOLD HARMLESS THE OWNER, THE OWNER'S REPRESENTATIVE, THE ENGINEER/ARCHITECT AND THEIR AGENTS AND EMPLOYEES FROM ANY AND ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES, INCLUDING ATTORNEYS' FEES, ARISING OUT OF OR RESULTING FROM THE PERFORMANCE OF THE WORK, INCLUDING, BUT NOT LIMITED TO, CLAIMS, DAMAGE, LOSS OR EXPENSES ATTRIBUTABLE TO BODILY INJURY, SICKNESS, DEATH OR TO ANY INJURY TO DESTRUCTION OF TANGIBLE PROPERTY, INCLUDING THE LOSS OF USE RESULTING THEREFROM, CAUSED IN WHOLE OR IN PART BY ANY NEGLIGENT OR WILLFUL ACT OR OMISSION OF THE CONTRACTOR, SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THEM OR ANYONE FOR WHOSE ACTS ANY OF THEM MAY BE LIABLE.

SECTION 50. LIMITATION OF LIABILITY

THE OWNER'S LIABILITY TO CONTRACTOR UNDER ANY CLAIM FOR BREACH OF CONTRACT IS LIMITED PURSUANT SECTION 271.153 OF THE TEXAS LOCAL GOVERNMENT CODE.

NOTWITHSTANDING THE FOREGOING, AND TO THE FULLEST EXTENT PERMITTED BY LAW, THE OWNER'S LIABILITY TO CONTRACTOR SHALL NOT EXCEED THE DIFFERENCE BETWEEN CONTRACTOR'S ACTUAL COSTS TO COMPLETE THE WORK, ON ONE HAND, AND THE TOTAL AMOUNT OF COMPENSATION FOR WHICH CONTRACTOR AGREED TO PERFORM ALL OF THE WORK DESCRIBED IN THE CONTRACT DOCUMENTS AS REFERENCED IN THE BID SCHEDULE AND IN ARTICLE 1 OF THE FORM OF AGREEMENT, ALLOWING FOR ADJUSTMENTS IN THE COMPENSATION OWED TO CONTRACTOR PURSUANT TO ANY CHANGE ORDERS AGREED UPON BY THE PARTIES IN WRITING, ON THE OTHER HAND.

GENERAL CONDITIONS OF CONTRACT continued:

SECTION 50. LIMITATION OF LIABILITY continued:

ADDITIONALLY, REGARDLESS OF THE NATURE OF ANY CLAIM(S) ASSERTED AGAINST THE OWNER, THE PARTIES AGREE THAT THE OWNER SHALL NOT BE LIABLE TO THE CONTRACTOR FOR ANY LABOR OVERRUN, EQUIPMENT OVERRUN, MATERIAL ESCALATION, EXTENDED FIELD COSTS, DELAYS CAUSED BY THE SUBMISSION OF INCORRECT OR INCOMPLETE SUBMITTALS, CONSEQUENTIAL DAMAGES, INDIRECT DAMAGES, INCIDENTAL DAMAGES, PUNITIVE OR EXEMPLARY DAMAGES, OR ANY OTHER NON-DIRECT DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, LOSS OF BONDING CAPACITY, UNABSORBED HOME OFFICE OVERHEAD, LOSS IN LABOR PRODUCTIVITY, OR ANY CONSEQUENTIAL DAMAGES THAT OTHERWISE WOULD BE ALLOWED UNDER SECTION 271.153(A)(1) OF THE TEXAS LOCAL GOVERNMENT CODE.

SECTION 51. CHAPTER 2252, TEXAS GOVERMENT CODE

In accordance with Chapter 2252 of the Texas Government Code, the Contractor hereby certifies that (a) Contractor does not engage in business with Iran, Sudan or any foreign terrorist organization and (b) Contractor is not listed by the Texas Comptroller as a terrorist organization.

SECTION 52. CHAPTER 2270, TEXAS GOVERNMENT CODE

In accordance with Chapter 2270, Texas Government Code, a government entity may not enter into a contract with a company for goods and services unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract. The signatory executing the contract on behalf of Contractor hereby certifies that the Contractor does not boycott Israel and will not boycott Israel throughout the term of this contract.

END OF SECTION

SUPPLEMENTAL GENERAL CONDITIONS OF CONTRACT FOR ENGINEERING/ARCHITECTURAL CONSTRUCTION

1. TEXAS WORKERS' COMPENSATION COMMISSION RULE §110.110

The Contractor shall not commence work under this contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until the insurance required of the subcontractor has been so obtained and approved. *For required coverages see General Conditions of Contract Section 28. Contractor's Insurance Requirements.*

Contractor shall abide by the Texas Workers' Compensation Commission rule §110.110 concerning requirements for governmental entities awarding a contract for a building or construction project, and for persons providing services on a building or construction project for a governmental entity.

Preamble to Rule 110.110 is provided as a guide to Contractor:

PREAMBLE TO RULE 110.110

The Texas Workers' Compensation Commission adopts new §110.110, concerning requirements for governmental entities awarding a contract for a building or construction project, and for persons providing services on a building or construction project for a governmental entity. The new rule is adopted with changes to the proposed text published in the April 26, 1994 issue of the Texas Register (19 TexReg 3131). Subsections (a)(7) and (c)(7) were amended by adding language to further clarify who is covered by the rule. Subsections (c)(7)(J) and (e)(3) were added to clarify that a contractor of subcontractor is representing to the governmental entity that workers' compensation coverage is provided. Subsections (d)(8)(C) were added to require specific language regarding representations of coverage to be added to contracts to provide services on the project. Subsections (c)(7)(F), and (c)(7)(I)(5), (d)(5), (d)(8)(F), (e)(6), and (e)(8)(F) were amended to reduce the retention period for contractors and other persons providing services on the project from three years to one year. Subsection (g) was changed to state that this rule applies to contract advertised for bid after September 1, 1994, rather than awarded after September 1, 1994.

The Texas Labor Code, §406.096, requires workers' compensation insurance coverage for all persons providing services on a building or construction project for a governmental entity. The commission is aware that this statutory requirement is not being met, and this rule is designed to achieve compliance and to implement a recordkeeping process which will enable oversight of compliance. The rule does this by placing requirements on the governmental entity and on contractors and other persons providing services on a project. These requirements include coverage, certificates of coverage, posted notices of coverage, and notification of changes in coverage status. The rule does not create any duty or burden on anyone which the law does not establish.

The rule defines terms which apply to governmental entity building or construction projects and sets up a clear procedure for governmental entities and contractors that bid for building and construction projects to follow in complying with the requirements of the Texas Labor Code §406.096. It also defines "persons who provide services on a project" who are subject to the statutory requirement of coverage, and sets forth their requirements to comply with the statute and the rule.

1. TEXAS WORKERS' COMPENSATION COMMISSION RULE §110.110 continued:

It specifically excludes persons such as food/beverage vendors whose deliveries and labor are not permanently incorporated into the project. The rule puts persons on notice that providing false or misleading certificates of coverage, or failing to provide or maintain required coverage, or failing to report any change that materially affects the provision of coverage may subject the contractor or other persons providing services on the project to administrative penalties, civil penalties, or other civil actions.

The rule requires a governmental entity to timely obtain certificates of coverage, retain them for the duration of the project plus three years, and provide them to the commission upon request and to others entitled to them by law. It also requires the governmental entity, as a prerequisite to awarding a contract, and as part of the contract, to require that the contractor: provide coverage and certificates of coverage for the contractor's employees; timely obtain and provide the governmental entity all required certificates of coverage for all persons providing services on the project; retain certificates of coverage on file for the duration of the project and for one year thereafter; notify the governmental entity in writing by certified mail or person delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; post notices on each project site; and contractually require persons with whom it contracts to do the same, with the certificates of coverage to be provided to the person for whom they are providing services. The rule also sets out the language to be included in bid specifications and in contracts awarded by a governmental entity and the information required to be in the posted notice to employees. It further established a method for obtaining the certificates from persons providing services on the project and providing them to the governmental entity.

It requires a contractor awarded a building or construction contract to: provide workers' compensation coverage to the contractor's employees for the duration of the project; file a certificate of coverage of the contractor's employees with the governmental entity prior to being awarded a contract; obtain and provide to the governmental entity, certificates of coverage from each other person with whom it has contracted to provide services on the project, prior to that person beginning work on the project; obtain and provide new certificates of coverage shown on the current certificate ends during the duration of the project; retain all certificates of coverage for the duration of the project and for one year thereafter; notify the governmental entity of material changes in coverage; contractually require each other person with whom it contracts to provide a certificate of coverage; and post notices on each project site.

All other persons providing services on a project have the same requirements as a contractor, with the exception of posting notices and with the exception that the certificate of coverage is given to the person for whom they contracted to provide services on the project. The rule uses the term "persons providing services on the project" in lieu of the statutory term "subcontractor" because the term "subcontractor" as used in the statute (§406.096) and in this rule is broader than standard industry usage. The use of the different terminology will prevent confusion.

The rule does not create any duty or burden on anyone which the law does not establish.

The new rule is adopted under the Texas Labor Code, §402.061, which authorizes the commission to adopt rules necessary to administer the Act, and Texas Labor Code, §406.096, which establishes requirements for governmental entities, contractors, and subcontractors ("persons providing services on the project") regarding workers' compensation coverage for workers on compensation coverage for workers on public building or construction projects.

1. TEXAS WORKERS' COMPENSATION COMMISSION RULE §110.110 continued:

Rule 110.100 Reporting Requirements for Building or Construction Projects for Governmental Entities

(a) The following word and terms, when used in this rule, shall have the following meanings, unless the context clearly indicates otherwise. Terms not defined in this rule shall have the meaning defined in the Texas Labor Code, if so defined.

(1) Certificate of coverage ("certificate")-A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees (including those subject to a coverage agreement) providing services on a project, for the duration of the project.

(2) Building or construction - Has the meaning defined in the Texas Labor Code, (e)(1).

(3) Contractor - A person bidding for or awarded a building or construction project by a governmental entity.

(4) Coverage - Workers' compensation insurance meeting the statutory requirements of the Texas Labor Code, §401.011(44).

(5) Coverage agreement - A written agreement on form TWCC-81, form TWCC-82, form TWCC-83, or form TWCC-84, filed with the Texas Workers' Compensation Commission which establishes a relationship between the parties for purposes of the Workers' Compensation Act, pursuant to the Texas Labor Code, Chapter 406, Subchapters F and G as one of employer/employee and establishes who will be responsible for providing workers' compensation coverage for person providing services on the project.

(6) Duration of the project - Includes the time from the beginning of work on the project until the work on the project has been completed and accepted by the governmental entity.

(7) Persons providing services on the project ("subcontractor" in §406.096 of the Act) - Includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes but is not limited to independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity furnishing persons to perform services on the project. "Services" includes but is not limited to providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other services related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

(8) Project - Includes the provision of all services related to a building or construction contract for a governmental entity.

1. TEXAS WORKERS' COMPENSATION COMMISSION RULE §110.110 continued:

(b) Providing or causing to be provided a certificate of coverage pursuant to this rule is a representation by the insured that all employees of the insured who are providing services on the project are covered by workers' compensation coverage, that the coverage is based on proper reporting of classification codes and payroll amounts, and that all coverage agreements have been filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading certificates of coverage, or failing to provide or maintain required coverage, or failing to report any change that materially affects the provision of coverage may subject the contractor or other person providing services on the project to administrative penalties, criminal penalties, civil penalties, or other civil actions.

(c) A governmental entity that enters into a building or construction contract on a project shall:

(1) include in the bid specifications, all the provisions of subsection (d) of this rule, using the language required by paragraph (7) of this subsection;

(2) as part of the contract, using the language required by paragraph (7) of this subsection, require the contractor to perform as required in subsection (d) of this rule;

(3) obtain from the contractor a certificate of coverage for each person providing services of the project, prior to that person beginning work on the project;

(4) obtain from the contractor a new certificate of coverage showing extension of coverage:

(A) before the end of the current coverage period, if the contractor's current certificate of coverage shows that the coverage period ends during the duration of the project; and

(B) no later than seven days after the expiration of the coverage for each other person providing services on the project whose current certificate shows that the coverage period ends during the duration of the project;

(5) retain certificates of coverage on file for the duration of the project and for three years thereafter;

(6) provide a copy of the certificates of coverage to the commission upon request and to any person entitled to them by law; and

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(7) use the following language for bid specifications and contracts, without any additional words or changes, except those required to accommodate the specific document in which they are contained or to impose stricter standard of documentation in Figure 1:

1. TEXAS WORKERS' COMPENSATION COMMISSION RULE §110.110 continued:

Article __. Worker's Compensation Insurance Coverage.

A. Definitions:

Certificate of coverage ("certificate")-A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

Duration of the project-includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity. Persons providing services on the project ("subcontractor" in §406.096)-includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

B. The contractor shall provide coverage, based on proper reporting a classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.044(44) for all employees of the contractor providing services on the project, for the duration of the project.

C. The contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

D. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

E. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

(1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificate of coverage showing coverage for all persons providing services on the project; and

(2) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

F. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

1. TEXAS WORKERS' COMPENSATION COMMISSION RULE §110.110 continued:

G. The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.

H. The contractor shall post on each project site a notice, in the text, for and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

I. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:

(1) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the project, for the duration of the project;

(2) provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;

(3) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(4) obtain from each person with whom it contracts, and provide to the contractor:

(a) a certificate of coverage, prior to the other person beginning work on the project; and

(b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any persons providing services on the project; and

(7) contractually require each person with whom it contracts, to perform as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.

1. TEXAS WORKERS' COMPENSATION COMMISSION RULE §110.110 continued:

J. By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, or other civil actions.

K. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the governmental entity.

(d) A contractor shall:

(1) provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

(2) provide a certificate of coverage showing workers' compensation coverage to the governmental entity prior to beginning work on the project;

(3) provide the governmental entity, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project;

(4) obtain from each person providing services on a project, and provide to the governmental entity:

(A) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

(B) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project;

1. TEXAS WORKERS' COMPENSATION COMMISSION RULE §110.110 continued:

(7) post a notice on each project site informing all persons providing services on the project that they are required to be covered, and stating how a person may verify current coverage and report failure to provide coverage. This notice does not satisfy other posting requirements imposed by the Act or other commission rules. This notice must be printed with a title in at least 30 point bold type and text in at least 19 point normal type, and shall be in both English and Spanish and any other language common to the worker population. The text for the notices shall be the following text in Figure 2 provided by the commission on the sample notice, without any additional word or changes:

(Figure 2)

REQUIRED WORKERS' COMPENSATION COVERAGE

"The law required that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee."

"Call the Texas Workers' Compensation Commission at 512-440-3789 to receive information on the legal requirements of coverage, to verify whether your employer has provided the required coverage or to report an employer's failure to provide coverage." and

(8) contractually require each person with whom it contracts to provide services on a project, to:

(A) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;

(B) provide a certificate of coverage to the contractor prior to that person beginning work on the project;

(C) include in all contracts to provide services on the project the language in subsection (e)(3) of this rule;

(D) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(E) obtain from each other person with whom it contracts and provide to the contractor:

(i) a certificate of coverage, prior to the other person beginning work on the project; and

(ii) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

1. TEXAS WORKERS' COMPENSATION COMMISSION RULE §110.110 continued:

(F) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(G) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(H) contractually require each other person with whom it contracts, to perform as required by paragraphs (A) - (H), with the certificate of coverage to be provided to the person for whom they are providing services.

(e) A person providing services on a project, other than a contractor, shall:

(1) provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

(2) provide a certificate of coverage as required by its contract to provide services on the project, prior to beginning work on the project;

(3) have the following language in its contract to provide services on the project:

"By signing this contract or providing or causing to be provided a certificate of coverage, the person signing this contract is representing to the governmental entity that all employees of the person signing this contract who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties criminal penalties, civil penalties, or other civil actions."

(4) provide the person for whom it is providing services on the project, prior to the end of the coverage period shown on its current certificate of coverage, a new certificate showing extension of coverage, if the coverage period shown on the certificate of coverage ends during the duration of the project;

(5) obtain from each person providing services on a project under contract to it, and provide as required by its contract:

(A) a certificate of coverage, prior to the other person beginning work on the project; and

(B) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

1. TEXAS WORKERS' COMPENSATION COMMISSION RULE §110.110 continued:

(6) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(7) notify the governmental entity in writing by certified mail or personal delivery, of any change that materially affects the provision of coverage of any person providing services on the project and send the notice within 10 days after the person knew or should have known of the change; and

(8) contractually require each other person with whom it contracts to:

(A) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;

(B) provide a certificate of coverage to it prior to that other person beginning work on the project;

(C) include in all contracts to provide services on the project the language in subsection (e)(3) of this rule;

(D) provide, prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(E) obtain from each other person under contract to it to provide services on the project, and provide as required by its contract;

(F) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(G) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(H) contractually require each person with whom it contracts, to perform as required by paragraphs (A) - (H), with the certificate of coverage to be provided to the person for whom they are providing services.

(f) If any provision of this rule or its application to any person or circumstance is held invalid, the invalidity does not affect other provisions or applications of this rule that can be given effect without the invalid provision or applications, and to this end the provisions of this rue are declared to be severable.

(g) This rule is applicable for building or construction contracts advertised for bid by a governmental entity on or after September 1, 1994.

2. PREVAILING WAGE LEGAL REQUIREMENTS

The Contractor's attention is called to Articles 5159A and 5160 of the Revised Civil statutes of Texas which Statutes must be complied with. These articles are as follows:

ARTICLE 5159A:

SECTION 1. Not less than the general prevailing rate of per diem wages for work of a similar character in the locality which the work is performed, and not less than the general prevailing rate of per diem wages for legal holiday and overtime work, shall be paid to all laborers, workmen and mechanics employed by or on behalf of any County, City and County, City, Town, District or other political subdivision of the State, engaged in the construction of public works, exclusive of maintenance work. Laborers, workmen and mechanics employed by contractors or subcontractors in the execution of any contract or contracts for public works with the State, or any officer or public body thereof, or in the execution of any contract or contracts for public works, with any County, City and County, City, Town, District or other political subdivision of this State, or any officer or public body thereof, shall be deemed to be employed upon public work.

SECTION 2. The public body awarding any contract for public work on behalf of the State, or on behalf of any County, City and County, City, Town, District or other political subdivision thereof, or otherwise undertaking any public work, shall ascertain the general prevailing rate of per diem wages in the locality in which the work is to be performed for each craft or type of workmen or mechanic needed to execute the contract, and shall specify in the call for bids for said contract, and in the contract itself, what the general prevailing rate of per diem wages in the said locality is for each craft or type of workmen needed to execute the contract, also the prevailing rate for legal holiday and overtime work, and it shall be needed to execute the contract, also the prevailing rate for legal holiday and overtime work, and it shall be mandatory upon the Contractor to whom the contract is awarded, and upon any subcontractor under him, to pay not less than the said specified rates to all laborers, workmen and mechanics employed by them in the execution of the contract. The Contractor shall forfeit as a penalty to the State, County, City and County, City, Town, District or other political subdivision on whose behalf the contract is made or awarded, Ten Dollars ($10.00) for each laborer, workman or mechanic employed for each calendar day, or portion thereof, such laborer, workman or mechanic is paid less than the stipulated rates for any work done under said contract, by him, or by any subcontractor under him, and the said public body awarding the contract shall cause to be inserted in the contract a stipulation to this effect. It shall be the duty of such public body awarding the contract, and its agents and officers to take cognizance of complaints of all violations of the provisions of this Act committed in the course of the execution of the contract, and when making payments to the contractor of monies becoming due under said contract to withhold and retain therefrom all sums and amounts which shall have been forfeited pursuant to the herein said stipulation and the terms of this Act; provided, however, that no sum shall be so withheld, retained or forfeited, except from the final payment, without a full investigation by the awarding body. It shall be lawful for any contractor to withhold from any subcontractor under him sufficient sums to cover any penalties withheld from him by the awarding body on account of said subcontractor's failure to comply with the terms of this Act, and if payment has already been made to him the contractor may recover from him the amount of the penalty or forfeiture in a suit at law.

SECTION 3. The contractor and each subcontractor shall keep, or cause to be kept, an accurate record showing the names and occupations of all laborers, workmen and mechanics employed by him, in connection with the said public work, and showing the actual per diem wages paid to each of such workers, which record shall be open at all reasonable hours to the inspection of the public body awarding the contract, its officers and agents.

2. PREVAILING WAGE LEGAL REQUIREMENTS Continued:

SECTION 4. Any construction or repair work done under contract, and paid for in whole or in part out of public funds, other than work done directly by any public utility company pursuant to order of the Railroad Commission or other public authority, whether or not done under public supervision or direction or paid for wholly or in part out of public funds, shall be held to be "public works" within the meaning of political subdivision of this State in which the building, highway, road, excavation, or other structures, project, development or improvement is situated in all cases in which the contract is awarded by the State, or any public body thereof, and shall be held to mean the limits of the County, City and County, City, Town, District or other political subdivision on whose behalf the contract is awarded in all other cases. The term "general prevailing rate of per diem wages" shall be the rate determined upon as such rate by the public body awarding the contract, or authorizing the work, whose decision in the matter shall be final. Nothing in this act, however, shall be construed to prohibit the payment to any laborer, workman or mechanic employed on any public work as aforesaid of more than the said general prevailing rate of wages.

ARTICLE 5160. Bond for Wages:

Any person or persons, firm or corporation, entering into a formal contract with this State or its counties or school districts or other subdivisions thereof or any municipality therein for the construction of any public building, or the prosecution and completion of any public work shall be required, before, commencing such work, to execute the usual Penal Bond, with additional obligation that such contractor shall promptly make payments to all persons supplying him or them with labor and materials in the prosecution of the work provided for in such contract. Any person, company, or corporation who has furnished labor or materials used in the construction or repair or any public building or public work, and payment for which has not been made, shall have the right to intervene and be made a party to any action instituted by the State or any adjudicated in such action and judgment rendered thereon, subject, however, to the priority of the claims and judgment of the State or municipality.

If the full amount of the liability of the surety on said bond is insufficient to pay the full amount of said claims and demands, then, after paying the full amount due to the State or municipality, the remainder shall be distributed pro-rata among said intervenors. Provided, further, that all claims for labor and materials furnished to said Contractor, and all claims for labor and material furnished to any contractor shall be itemized and sworn to as required by Statutes as to mechanic's lien claims, and such claims shall be filed with the County Clerk of the County, in which said work is being prosecuted, within ninety days from the date of the delivery of said material and the performance of said work. The County Clerk shall note on the mechanic's lien record, the name of the claimant, the amount claimed, the name of the contractor and the name of the county, School District, other subdivisions, or municipality with which the contract was made; and the County Clerk shall index the claim under the name of the contractor and under the name of the County, School District, other subdivision or municipality; with which the contract was made.

Provided further, that after completion and acceptance of completed project all moneys due contractor under said contract shall be held by the state or its counties or school districts or other subdivision, thereof or an affidavit made by Contractor that all just bills for labor and material under this contract has been paid in full by the Contractor.

Acts 1913, P. 185; Acts 1929, 41st leg., P.4881. Ch. 22 paragraph 1.

SECTION I

General Decision Number: TX180008 01/05/2018 TX8

Superseded General Decision Number: TX20170008

State: Texas

Construction Types: Heavy and Highway

Counties: Cameron, Hidalgo and Webb Counties in Texas.

HEAVY & HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/05/2018

* SUTX2011-003 08/02/2011

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER (Paving & Structures)	$ 12.46	
FORM BUILDER/FORM SETTER (Structures)	$ 12.30	
FORM SETTER (Paving & Curb)	$ 12.16	
LABORER		
Asphalt Raker	$ 10.61	
Flagger	$ 9.10	
Laborer, Common	$ 9.86	
Laborer, Utility	$ 11.53	
Pipelayer	$ 11.87	
Work Zone Barricade Servicer	$ 12.88	
POWER EQUIPMENT OPERATOR:		
Asphalt Distributor	$ 13.48	
Asphalt Paving Machine	$ 12.25	
Broom or Sweeper	$ 10.33	
Crane, Lattice Boom 80 Tons or Less	$ 14.39	
Crawler Tractor	$ 16.63	
Excavator, 50,000 lbs or less	$ 12.56	
Excavator, over 50,000 lbs	$ 15.23	
Foundation Drill, Truck Mounted	$ 16.86	
Front End Loader Operator, Over 3 CY	$ 13.69	
Front End Loader, 3 CY or less	$ 13.49	
Loader/Backhoe	$ 12.77	
Mechanic	$ 15.47	
Milling Machine	$ 14.64	
Motor Grader Operator, Rough	$ 14.62	
Motor Grader, Fine Grade	$ 16.52	
Scraper	$ 11.07	
Servicer	$ 12.34	
Steel Worker (Reinforcing)	$ 14.07	
TRUCK DRIVER		
Lowboy-Float	$ 13.63	

Single Axle.....$ 10.82
Single or Tandem Axle Dump..$ 14.53
Tandem Axle Tractor with
Semi Trailer.....$ 12.12

WELDER.....$ 14.02

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a

new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

EXHIBIT L-1

AFFIDAVIT AND WAIVER OF LIEN PRIME CONTRACTOR

STATE OF _____

COUNTY OF _____

Personally appeared before me, the undersigned Notary Public for said County and State _____(Name of Individual), _____ (Title) of _____ (Prime Contractor), who being duly sworn by me states on oath that all product suppliers and Subcontractors, payrolls, sales tax, privilege tax or license, old age benefits tax, state and federal unemployment insurance, and other liabilities incurred in the performance of _____ (Type of Contract) Contract for the construction of improvements at **Project No. #_____ Project Title _____(Name of Project**), have been paid in full and that the above named Prime Contractor waives any claims and released _____ (Owner) from any rights or claims (including lien rights) for debts due and owing by virtue of the furnishing of any labor, products, and supplies furnished for such improvements.

The above named Prime Contractor agrees to indemnify the Owner and save him harmless on account of any loss he may sustain in reliance upon this Affidavit and Waiver of Lien including the amount of any lien he may be compelled to pay all costs relating thereto and a reasonable attorney's fee.

_____
(Prime Contractor)

By: _____
Type/Print Name

Title:_____

Date: _____

Sworn to and subscribed before me
this the ___ day of _____, 20__.

_____
Notary Public

My Commission Expires:_____

EXHIBIT L-2

RELEASE AND WAIVER OF CLAIMS BY SUBCONTRACTORS AND PRODUCT VENDORS

STATE OF _____

COUNTY OF _____

Personally appeared before me the undersigned authority in and for said County and State (Name of Individual), _____ (Title) of _____ (Company), who, being duly sworn by me states on oath that all bills for labor and products, sales tax, privilege tax or license, old age benefits tax, state and federal unemployment insurance and other liability have been paid in full, or that funds are in hand to discharge such liabilities when due, incurred in the performance of its Subcontract for furnishing labor or products in the construction of improvements at **Project No. #_____ Project Title _____ _____ (Name of Project & Location),** upon receipt of check in the amount $_____, the undersigned company waives any claims and releases (Owner) _____ (Contractor) from any rights or claims for debts due and owing by virtue of the furnishing of any labor or products and any lien therefore.

_____
(Name of Company)

Signature:_____

By:_____
Type/Print Name

Title:_____

Date:_____

Sworn to and subscribed before me
this _____ day of _____, 20__.

_____
Notary Public

My Commission Expires: _____

EXHIBIT L-3

CONTRACTOR'S AFFIDAVIT AS TO STATUS OF LIENS

STATE OF _____

COUNTY OF _____

Personally appeared before me, the undersigned Notary Public for said County and State, _____(Name of Individual), _____ (Title), of _____ (Prime Contractor), who being duly sworn by me states on oath that to the best of his knowledge and belief, except as listed below, the Releases and Waivers of Claim attached hereto include all Subcontractors and all suppliers of labor, products, and equipment provided by all persons who may have lien against the property of _____ (Owner), **Project No. #__ Project Title _____ _____,** located at _____(Location of Project), arising out of the construction of improvements thereon.

Exceptions: (If none, write "NONE." Any exception listed shall be bonded by the Contractor to indemnify the Owner, and a copy of each such bond shall be attached hereto.)

1.

2.

3.

4.

_____
(Name of Company)

By: _____
Type/Print Name

Title: _____

Date: _____

Sworn to and subscribed before me
this ____ day of _____, 20_____

_____
Notary Public
My Commission Expires: _____

M. TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

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01411 – Environmental Protection
01460 – Laboratory Testing and Inspection Services
01564 – Ground Water Handling
01568 – Erosion and Sediment Control during Construction
01600 – Product Requirements Specifications
01700 – Project Closeout Procedures

Division 2 – SITE CONSTRUCTION

02101 – Preparation of Right of Way
02102 – Clearing and Grubbing
02210 – Grading and Earthwork
02220 – Subgrade Preparation
02225 – Excavation Backfill and Compaction for Pavement
02226 – Loading & Hauling
02230 – Excavation
02230 – Site Clearing
02234 – Borrow
02238 – Concrete Removal
02240 – Lime Stabilization
02558 – Water Valves
02601 – Flexible Base
02610 – Prime Coat
02612 – Hot Mix Asphalt Concrete Pavement
02617 – Asphalt Surface Treatment
02620 – Concrete Curb and Gutter
02630 – Concrete Pavement
02640 – Concrete Sidewalks
02680 – Flat Wheel Rolling
02721 – Vinyl Coated Chain Link Fencing
02722 – Vinyl Fencing
02780 – Concrete Unit Pavers
02900 – Landscape Planting Specifications
02920 – Landscape Mulch
02921 – Compost as a Landscape Backfill Mix Component
02935 – Grass Seeding
02945 – Landscape Edging
02975 – Landscape Irrigation System

Division 3 – CONCRETE

03300 – Cast-in-Place Concrete
03310 – Supplied Concrete
03320 – Concrete Admixtures
03330 – Reinforcing Steel

Division 9 – FINISHES

09101 – Construction Traffic Control

SPECIAL PROVISIONS

IN ALL CASES WHERE THESE SPECIAL PROVISIONS CONFLICT WITH THE TECHNICAL SPECIFICATION SECTIONS, GENERAL CONDITIONS OF THE AGREEMENT, SUPPLEMENTARY GENERAL CONDITIONS, CONTRACT CONDITIONS, OR ANY OTHER DOCUMENT CONTAINED HEREIN, THESE SPECIAL PROVISIONS SHALL GOVERN.

1. Definitions:
    a. OWNER – shall be the **City of McAllen or a representative of the Parks Department**
    b. CITY – shall be the **City of McAllen**

2. The CONTRACTOR shall do all necessary erosion control, clearing & grubbing, grading, excavation, trenching, dewatering, backfill, etc., to complete the project. Such costs shall be subsidiary to the bid items in the Proposal. All excavation is unclassified. All material removed such as concrete, broken pipe, excess backfill, etc., and not deemed salvageable shall become the property of the CONTRACTOR and he shall be responsible for removing it from the site at no extra expense to the OWNER. Existing material, fencing or fixtures deemed salvageable by the OWNER shall be carefully removed and hauled to a designated location as directed by the OWNER within the City at no extra expense to the OWNER.

3. All trees, plants, grass and shrubs, except those which will be affected by construction shall be protected at all times and properly maintained (mow grass, pruning, weeded) and clean-up with-in the construction limits to be included. The areas in and adjacent to the construction site shall be restored to their original conditions if damaged during construction. The CONTRACTOR shall provide specified grass type to restore damaged areas. Only quality topsoil shall be used for filling the top four inches of those areas damaged or filled.

4. Damages done to existing utilities, power poles, fences, signs, mailboxes, driveways, culverts, pavement, drainage systems, etc. shall be repaired by the CONTRACTOR, at no cost to the OWNER, and such costs shall be subsidiary to the various unit items in the Proposal.

5. The City of McAllen shall provide all construction material testing to be paid for by OWNER, but re-testing shall be charged to the CONTRACTOR for failed testing and no additional compensation will be made or allowed for reworking the necessary defective work not meeting the specified work from the plans and specifications. Any re-testing required by no-passing results shall be paid for by the CONTRACTOR in which the city shall furnish the failed ticket invoices.

6. The CONTRACTOR shall furnish the Site Inspector and Observer, and OWNER, the names, address and telephone numbers of all personnel responsible for the work in case of Emergencies.

7. The successful CONTRACTOR shall attend a pre-construction conference with the OWNER, CONSULTANTS and other Officials at a date and time to be specified.

8. All work must be performed during regular business hours of 8 a.m. to 5 p.m., Monday thru Friday, except City recognized holidays. The CONTRACTOR may request work outside these hours, if the CONTRACTOR will require the presence of a Site Inspector, CONTRACTOR will incur charges for the presence of the Site Inspector, a cost of which will be borne by the CONTRACTOR. No cost for the Site Inspector will be charged should the work be requested by the CITY. CONTRACTOR shall coordinate all work where construction work is to be in project area with other contractors and CITY OF MCALLEN.

9. The Plans show approximate locations of existing utilities including gas lines, telephone lines, power lines, water lines, sewer lines, storm sewers and irrigation lines within the vicinity. The CONTRACTOR

is responsible for locating all existing utilities and shall exercise extreme care in working in the vicinity of these lines. Should the contractor identify any conflicts with the existing facilities as located in the field and the information as shown on the plans, the CONTRACTOR shall immediately notify the following:

City of McAllen – Engineering Department & Parks & Recreation Department
Mario Cruz, P.E. – (956)681-1164
Sergio Saldaña - Construction Manager (956) 681-3333

All existing lines, whether belonging to City or Private, shall remain in operation at all times. Switchover time, re-connecting new service from existing lines or services (if any) shall be kept to a minimum. CONTRACTOR shall be responsible for any re-connects, temporary or otherwise, of all water and sanitary sewer lines required to complete the project. Unless otherwise specified in the bid proposal form, payment for such items shall be subsidiary to all the various items of the bid.

10. The OWNER reserves the right to add or delete quantities of bid items in the Proposal at the Unit Prices given, provided however that such additions or reductions are within the aggregate limits specified in the General Conditions of the Agreement.

11. Until FINAL acceptance by the OWNER all of the material as provided for in these specifications shall be under the charge and care of the CONTRACTOR and he shall take every necessary precaution against injury or damage to any part of the material by action of the elements from the non-execution of the work. The CONTRACTOR shall rebuild, repair, restore and make good, at his own expense, all injuries or damage to any portion of the materials before its' completion and acceptance.

12. In cases where the CONTRACTOR deems extra compensation is due him for materials not clearly covered in the contract or not ordered by the OWNER as an extra item, the CONTRACTOR shall notify the OWNER in writing (Request for Information) of his intention to make claim for such extra compensation before he begins the work. The CONTRACTOR shall not proceed until the OWNER, and CONTRACTOR approve a written CHANGE ORDER. Failure on the part of the CONTRACTOR to give such notification or to afford the OWNER proper facilities for keeping strict account of actual costs shall constitute a waiver of the claim for such extra compensation. The filing of such notice by the CONTRACTOR and the keeping of costs by the OWNER shall not in any way be construed to prove the validity of the claim. When the work has been completed, the CONTRACTOR shall, within 10 days, file his claim for extra compensation with the OWNER.

13. Upon the failure of the CONTRACTOR to repair satisfactorily or to remove and replace, if so directed, rejected, unauthorized, or condemned materials immediately after receiving formal notice from the OWNER, the OWNER may recover for such defective materials on the CONTRACTOR'S bond, or by action in a court having proper jurisdiction over such matters, or may employ labor and equipment and satisfactorily repair or remove and replace such work and charge the cost of the same to the CONTRACTOR, which cost will be deducted from any money due him.

14. Saw cutting of existing asphalt or concrete for construction joints will be the only accepted method.

15. The CONTRACTOR shall warrant all work for a period of not less that one (1) year from the date of final acceptance of the work by the OWNER. CONTRACTOR is responsible for scheduling a final inspection in the presence of the OWNER, and CONTRACTOR, whereupon all items must be in accordance with plans and specifications, prior to final acceptance.

16. The CONTRACTOR is responsible for familiarizing himself and following the project plans, project specifications and City of McAllen Standard Specifications for those items not specifically shown on the project plans or project specifications.

17. All work will be coordinated with the City of McAllen Parks & Recreation Department.

18. All work shall be performed in compliance with all federal, state, and local laws including governing bodies and guidelines.

19. Relocations of existing fences, mailboxes, driveways, culverts, pavement, drainage systems, etc. (where not indicated on plans) shall be repaired by the CONTRACTOR at no cost to the OWNER, and such costs shall be subsidiary to the various unit items in the Proposal.

20. Submittals and/or shop drawings for all bid items shall be provided to OWNER prior to construction. Contractor is responsible for submission of a master submittals list.

21. The CONTRACTOR shall coordinate with the City of McAllen and other County, State and Federal agencies to keep access at all times to adjacent property owners during construction. Any temporary drives used shall be coordinated with the City of McAllen. No separate pay.

22. The City of McAllen reserves the right to award the projects individually or in any combination thereof.

23. Contractor will be responsible for observance of all activities relating to the construction of project including Security activities, pedestrian traffic and high vehicular traffic times so as not to interfere with project activities.

24. Contractor shall coordinate with City of McAllen prior to any City lane closures.

SECTION 01005

DEFINITIONS AND TERMINOLOGY

1.00 PART 1 - GENERAL

1.01 SPECIFICATION TERMINOLOGY

A. "Certified" used in context with materials and equipment means the material and equipment has been tested arid found by a nationally recognized testing laboratory to meet specification requirements, or nationally recognized standards if requirements are not specified, and is safe for use in the specified manner. A nationally recognized testing laboratory must periodically inspect production of the equipment and the equipment must bear a label, tag, or other record of certification.

B. "Certified" used in context with labor performance or ability to install materials and equipment means that the abilities of the proposed installer have been tested by an representative of the specified testing agency authorized to issue certificates of competency and has met the prescribed standards for certification.

C. "Certified" used in context with test reports, payment requests or other statements of fact means that the statements made on the document are a true statement as attested to by the certifying entity.

D. "Engineer" shall mean the City of McAllen, Engineering Department, City Engineer or their designated representative.

E. 'Furnish" means to supply, deliver and unload materials and equipment at the project site ready to install.

F. "Indicated" means graphic representations, notes, or schedules on drawings, or other requirements in Contract Documents. Words such as "shown', "noted', "scheduled", are used to help locate the reference. No limitation on the location is intended unless specifically noted.

G. "Install", means the operations at the project site including unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, training and similar operations required to prepare the materials and equipment for use, verify conformance with Contract Documents and prepare for acceptance and operation by the Owner.

H. "Installer" means an entity engaged by Contractor, either as an employee, subcontractor, or sub-subcontractor to install materials and/or equipment. Installers are to have successfully completed a minimum of five projects similar in size and scope to this project, have a minimum of five years of experience in the installation of similar materials and equipment, and comply with the requirements of the authority having jurisdiction.

I. "Labeled" means equipment that embodies a valid label, symbol, or other identifying mark of a nationally recognized testing laboratory such as Underwriters Laboratories, Inc. and production is periodically inspected in accordance with nationally recognized standards or tests to determine safe use in a specified manner.

J. "Listed" means equipment is included in a list published by a nationally recognized

laboratory which makes periodic inspection of production of such equipment and states that such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner.

K. "Manufacturer" means an entity engaged by Contractor, as a subcontractor, or sub-subcontractor to furnish materials and/or equipment. Manufacturers are to have a minimum of five years experience in the manufacture of materials and equipment similar in size, capacity and scope to the specified materials and equipment.

L. "Perform" means to complete the operations necessary to comply with the Contract Documents.

M. "Owner" means City of McAllen.

N. "Project site" means the space available to perform the work, either exclusively or in conjunction with others performing construction at the project site.

0. "Provide" means to furnish and install materials and equipment.

P. "Regulation" means laws, statutes, ordinances, and lawful orders issued by authorities having jurisdiction, as well as, rules, conventions, and agreements within the construction industry that control performance of work, whether they are lawfully imposed by authorities having jurisdiction or not.

Q. "Specified" means written representations in the bid documents or the technical specifications.

1.02 SPECIFICATION SENTENCE STRUCTURE

A. Specifications are written in modified brief style. Requirements apply to all work of the same kind, class, and type even though the word "all" is not stated.

B. Simple imperative sentence structure is used which places a verb as the first word in the sentence. It is understood that the words "furnish", "install", "provide", or similar words include the meaning of the phrase "The Contractor shall.' before these words.

C. It is understood that the words "directed", 'designated", requested", 'authorized", "approved", "selected', or similar words include the meaning of the phrase "by the Engineer" after these words unless otherwise stated. Use of these words does not extend the Engineers responsibility for construction supervision or responsibilities beyond those defined in the General Conditions.

D. "At no additional cost to Owner", "with no extra compensation to Contractor", "At Contractor's own expense", or similar words mean that the Contractor will perform or provide specified operation of work without any increase in the Contract Amount. It is understood that the cost for performing all work is included in the amount bid and will be performed at no additional cost to the Owner unless specifically stated otherwise.

1.03 DOCUMENT ORGANIZATION

A. Organization of Contract Documents is not intended to control or to lessen the responsibility of the Contractor when dividing work among subcontractors, or to establish the extent of work to be performed by any trade, subcontractor or vendor. Specification or details do not need to be indicated or specified in each specification or drawing. Items shown in the

contract documents are applicable regardless of location in the Contract Documents.

B. Standard paragraph titles and other identifications of subject matter in the specifications are intended to aid in locating and recognizing various requirements of the specifications. Titles do not define, limit, or otherwise restrict specification text.

C. Capitalizing words in the text does not mean that these words convey special or unique meanings or have precedence over other parts of the Contract Documents. Specification text governs over titling and it is understood that the specification is to be interpreted as a whole.

D. Drawings and specifications do not indicate or describe all of the work required to complete the project. Additional details required for the correct installation of selected products are to be provided by the Contractor and coordinated with the Engineer. Provide any work, materials or equipment required for a complete and functional system even if they are not detailed or specified.

1.04 INTERPRETATIONS OF DOCUMENTS

A. Comply with the most stringent requirements where compliance with two (2) or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, unless Contract Documents indicate otherwise.

1. Quantity or quality level shown or indicated shall be minimum to be provided or performed in every instance.

2. Actual installation may comply exactly with minimum quality indicated, or it may exceed that minimum within reasonable limits.

3. En complying with these requirements, indicated numeric values are minimum or maximum values, as noted, or appropriate for context of requirements.

4. Refer instances of uncertainty to the Engineer for a decision before proceeding.

B. Provide materials and equipment comparable in quality to similar materials and equipment incorporated in the project or as required to meet the minimum requirements of the application if the materials and equipment are shown in the drawings but are not included in the specifications.

1.05 REFERENCE STANDARDS

A. Comply with applicable construction industry standards as if bound or copied directly into the Contract Documents regardless of lack of reference in the Contract Documents. Apply provisions of the Contract, Documents where Contract Documents include more stringent requirements than the referenced standards.

1. Standards referenced directly in the Contract Documents take precedence over standards that are not referenced but recognized in the construction industry as applicable.

2. Comply with standards not referenced but recognized in the construction industry as applicable for performance of the work except as otherwise limited by the Contract Documents. The Engineer determines whether code or standard is applicable, or which of several are applicable.

B. Consider a referenced standard to be the latest edition with supplements or amendments

when a standard is referred to in an individual specification section but is not listed by title and date.

C. Trade association names and title of general standards are frequently abbreviated. Acronyms or abbreviations used in the Contract Documents mean the recognized name of trade association, standards generating organization, authority having jurisdiction, or other entity applicable in the context of the Contract Documents. Refer to "Encyclopedia of Associations," published by Gale Research Company.

D. Make copies of reference standards available as requested by Engineer or Owner.

1.06 SUBSTITUTIONS AND EQUAL PRODUCTS

Provide materials and equipment manufactured by the entities specifically listed in each technical specification section. Submit a Contractors Modification Request per Section 01300, SUBMITTALS for substitution of materials and equipment of manufacturers not specifically listed or for materials and equipment that does not strictly comply with the Contract Documents. Contractor may provide "equal" products manufactured by manufacturers other than those specifically listed in the technical specification section unless it is specifically stated that only the materials and equipment of the specified manufacturers shall be provided. Provide a request for approval of proposed equals per Section 01300 SUBMITTALS for any materials or equipment not specifically listed. Submit a Contractors Modification Request for substitution of materials and equipment of other manufacturers or for materials and equipment that does not strictly comply with the Contract Documents. A Field Order or Change Order will be issued if the contract modification is approved.

***** END OF SECTION *****

SECTION 01010

BICENTENNIAL HIKE & BIKE TRAIL - SUMMARY OF WORK

Bicentennial Hike & Bike Trail Improvements include a **15 space parking lot**. Work extends from Nolana Ave. north to the existing rail road tracks. Improvements include erosion control, clearing, earthwork, grading, traffic control, curbing, parking lot, landscaping, irrigation (drip & bubbler), signage, lighting, concrete ADA ramps, sidewalks, driveway aprons, benches, trash receptacles, bike racks and other appurtenances.

SECTION 01040

PROJECT ADMINISTRATION

PART 1- GENERAL

1.01 WORK INCLUDED

A. Administer contract requirements to construct the project. Provide documentation per the requirements of this Section. Provide information as requested by the Engineer/Architect or Owner concerning this project.

1.02 SUBMITTALS

A. Submittals shall be in accordance with Section 01300, SUBMITTALS.

1.03 COMMUNICATION DURING THE PROJECT

A. The Engineer is to be the first point of contact for all parties on matters concerning this project.

B. The Engineer will coordinate correspondence concerning:
   1. Submittals, including requests for payment
   2. Clarification and interpretation of the Contract Documents
   3. Contract modifications
   4. Observation of work and testing
   5. Claims

C. The Engineer will normally communicate only with the Contractor. Any required communication with suppliers or subcontractors will only be with the direct involvement of the Contractor.

D. Written communications are to be directed to the Engineer at the address indicated in the Pre-construction Conference. Communications should include as a minimum:

   1. Name of the Owner – **City of McAllen**
   2. Project name – **Martin Ave Widening: S 6th St to S 7th St**
   3. Contract title – **to be determined**
   4. Project number – **08-1023**
   5. Date – **date of communication**
   6. A reference statement – **based on communications**

E. Submit communications on the forms referenced in this Section or in Section 01300. SUBMITTALS.

1.04 PROJECT MEETINGS

A. Pre-construction Conference
   1. Attend a pre-construction meeting.
   2. The location of the conference will be determined by the Owner.
   3. The time of the meeting will be determined by the Owner but will be after the Notice of

Award is issued and not later than fifteen (15) days after the Notice to Proceed is issued.

4. Meeting will be attended by the Owner, Engineer and the Contractors project manager and superintendent. Meeting may be attended by representative of utility companies and representatives from major subcontractors and suppliers.
5. Contractor should provide and be prepared to discuss:
   a. Preliminary construction schedule per Section 01310, PROGRESS SCHEDULE.
   b. Preliminary Submittal Schedule.
   c. Schedule of values and anticipated schedule of payments.
   d. List of Suppliers and Subcontractors.
   e. Contractor's organizational chart as it relates to this project.
   f. Letter indicating the agents of authority for the Contractor and the limit of that authority with respect to the execution of legal documents.

B. Periodical Progress Meetings

1. Attend meetings with the Engineer and Owner.
   a. Meet on a Monthly basis or as requested by the Engineer to discuss the project.
   b. Meet at the project site or other location as designated by the Engineer.
   c. Contractors superintendent and other key personnel are to attend the meeting. Other individuals may be requested to attend to discuss specific matters.
2. Provide information as requested by the Engineer or Owner concerning this project.
   a. Prepare to discuss:
      1) Status of overall project schedule.
      2) Contractors detailed schedule for the next month.
      3) Anticipated delivery dates for equipment.
      4) Coordination with the Owner.
      5) Status of submittals.
      6) Information or clarification of the Contract Documents.
      7) Claims and proposed modifications to the contract.
      8) Field observations, problems, or conflicts.
      9) Maintenance of quality standards.
   b. Notify the Engineer of any specific items to be discussed a minimum of one (1) week prior to the meeting.
3. Review minutes of meetings and notify the Engineer of any discrepancies within ten (10) days of the date of the memorandum.

   a. Following that date, the minutes will stand as shown or as corrected.
   b. Corrections will be reflected in the minutes of the following meeting.
   c. Each item of business shall be numbered to indicate the meeting number and the item number. Items discussed will be documented and old business items will remain on minutes of subsequent meetings until the item is resolved.

1.05 REQUESTS FOR INFORMATION

A. Submit Request for Information (RFI) to the Engineer to obtain additional information or clarification of the Contract Documents.

1. Submit a separate RFI for each item.
2. Attach adequate information to permit a written response without further clarification. Engineer will return requests which do not have adequate information for additional information.
3. A response will be made when adequate information is provided. Response will be made on the RFI form or in attached information.

B. If the RFI indicates that a contract modification is required, the Engineer will initiate a Proposed Contract Modification (PCM) per Section 1.07.

1.06 NOTIFICATION BY CONTRACTOR

A. Notify the Engineer of:

I. Need for testing.
2. Intent to work outside regular working hours.
3. Request to shut down facilities or utilities.
4. Proposed utility connections.
5. Required observation by Owner or inspection agencies prior to covering work.

B. Notification must be provided in time for Owner and Engineer to respond appropriately to the notification.

C. Use "Notification By Contractor" form. Form can be requested from Owner or Engineer.

1.07 REQUESTS FOR MODIFICATIONS

A. Submit a request to the Engineer for any change in the Contract Documents or approval of any deviations from the Contract Documents.

1. Use the "Contractors Modification Request" (CMR) form. Contractor's own form can also be submitted pending completeness of required information.
   a. Assign a number to the CMR when issued.
   b. Include with the CMR:
      1) A complete description of the proposed modification.
      2) The reason the modification is requested.
      3) A detailed breakdown of the cost of the change (necessary only if the modification requires a change in contract amount). The itemized breakdown is to include:
         (a) list of materials and equipment to be installed,
         (b) man hours for labor by classification,
         (c) equipment used in construction,
         (d) consumable supplies, fuels, and materials,
         (e) royalties and patent fees,
         (f) bonds and insurance,
         (g) overhead and profit,
         (h) field office costs,
         (i) home office cost,
         (j) and other items of cost.
      4) A revised schedule indicating the effect on the critical path for the project and a statement of the number of days the project may be delayed by the modification.
2. A CMR is required for field changes.
   a. Request must be made a minimum of two (2) weeks in advance of performing the work affected.
   b. Request for field changes will be submitted to the Engineer.
3. A CMR is required for all substitutes or deviations from the Contract Documents.
4. Engineer will evaluate the request for a contract modification.

B. Owner will initiate changes through the Engineer.

1. Engineer will prepare a description of the proposed modifications to the Contract Documents.
2. Engineer will use the "Proposed Contract Modification' form or own form. Engineer will assign a number to the PCM when issued.
3. Return request with a proposal to incorporate the requested change. Include a breakdown of costs into materials and labor in sufficient detail to allow evaluation by the Engineer.

C. If a contract modification is required, the Engineer will issue a Field Order or a Change Order.

I. Modifications to the contract can only be made by a Field Order or a Change Order.
2. Changes in the project will be documented by Field Order or by a Change Order.
3. Field Orders may be issued by the Engineer for contract modifications that do not change the contract amount or contract time.
4. Any modifications that require a change in contract amount or contract time can only be approved by Change Order.
   a. CMR's and proposals issued by the Contractor in response to a PCM will be evaluated by the Engineer.
   b. If change order is recommended, the Engineer will prepare the change order.
   c. The Change Order will be sent to the Contractor for execution with a copy to the Owner recommending approval.
   d. Change Orders can only be approved by the Owner.
      1) Work performed on the proposed contract modifications prior to the approval of the Change Order will be performed at the Contractor's risk.
      2) No payment will be made for work on Change Orders until approved by the Owner.

D. The Contractor may be informed that the proposed modification is not approved and construction is to proceed in accordance with the Contract Documents.

1.08 EMERGENCY WORK

A. Notify the Owner and Engineer immediately of any additional work that must be performed to prevent injury or damage to existing structures, facilities, utilities, or work in place.

B. When possible, obtain authorization from the Owner before proceeding.

1.09 CLAIMS

A. Do not perform any work which is considered to be outside the scope of the Contract Documents without an approved Change Order.

B. File notice of claims with the Engineer within 10 days of the event giving rise to the claim.

C. Provide full documentation within 30 days of the notice.

D. Items not reported within the stipulated time will not be considered.

1. Failure to notify the Owner of potential claims does not allow the Owner to take alternative action to prevent the Contractor from incurring the cost for the item or to perform the work in a different manner.
2. Failure to notify the Owner does not allow operations to be monitored for the actual cost

of performing the work.

E. When full documentation has been received by the Engineer, the claim will be reviewed in the context of the Contract Documents.

1. If the claim is valid, a Change Order will be prepared and payment of the Change Order will he recommended.
2. If the claim is not valid, then the claim will be denied with an explanation of the reasons.
3. Should the Contractor disagree with the decision of the Engineer, the Contractor may refuse to do the work.
   a. If the Owner insists that the work be done, proceed with the work on a time and materials basis.
   b. The validity of the claim will be resolved at a later time in accordance with the Contract Documents.

1.10 RECORD DRAWINGS

A. Maintain at the site one (1) complete record copy of:

I. Drawings
2. Specifications
3. Addenda
4. Contract modifications
5. Approved shop drawings and record data
6. One (I) set of construction photographs
7. Test records
8. Clarifications and other information provided in RFI responses.

B. Marking Drawings

1. Label each document as “Project Record” in large printed letters.
2. Record information as construction is being performed.
   a. Do not conceal any work until the required information is recorded.
   b. Mark drawings to record actual construction, including the following:
      1) Depths of various elements of the foundation in relation to finished first floor datum or the top of walls.
      2) Horizontal and vertical locations of underground utilities and appurtenances constructed and existing utilities encountered during construction.
      3) Location of internal utilities and appurtenances concealed in the construction. Make reference to permanent structure on the surface. Include the following equipment:
         (a) Piping
         (b) Ductwork
         (c) Equipment and control devices requiring periodic maintenance or repair
         (d) Valves, unions, traps, and tanks
         (e) Services entrance
         (f) Feeders
         (g) Outlets
      4) Changes of dimension and detail.
      5) Changes made by Field Order and Change Order.
      6) Details not on the original Contract Drawings.
   c. Mark specifications and addenda to record materials and the equipment provided.

1) Record manufacturer name, trade name, catalog number, and each supplier (with address and phone number) of each product and item of equipment actually installed.
2) Record changes made by Field Order and Change Order.

d. Mark additional work or information in erasable pencil.
1) Use red for new or revised indication.
2) Use purple for work deleted or not installed (lines to be removed).
3) Highlight in yellow the items constructed per the plans.

e. Submit record documents to Engineer for review and acceptance 30 days prior to final completion of the project.
1) Provide one (I) set of marked up drawings.
2) Provide one (1) set of specifications.

f. Partial Payment Requests will not be recommended for payment if record documents are found to be: incomplete or not in order. Final payment will not be recommended without record documents.

PART 2- PRODUCTS (NOT INCLUDED)

PART 3- EXECUTION (NOT INCLUDED)

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Contractor shall submit documentation as required by the Contract Documents and as reasonably requested by the Owner and Engineer to:

1. Record the products incorporated into the Project for the Owner.

2. Provide information for operation and maintenance of the Project.

3. Provide information for the administration of the Contract.

4. Allow the Engineer to advise the Owner if products proposed for the project by the Contractor conform, in general, with the design concepts of the Contract Documents.

B. Contractors responsibility for full compliance with the Contract Documents is not relieved by the Engineers review of submittals, Contract modifications may only be approved by Change Order or Field Order.

1.02 CONTRACTORS RESPONSIBILITIES

A. Review all submittals prior to submission.

B. Determine and verify:

1. Field measurements.

2. Field construction requirements.

3. Location of all existing structures, utilities and equipment related to the submittals.

4. Submittals are complete for their intended purpose.

5. Conflicts between the submittals related to the various subcontractors and suppliers have been resolved.

6. Quantities and dimensions shown on the submittals.

C. Submit information per the procedures described in this section and the detailed specifications.

D. Furnish the following submittals:

1. As specified in the attached Submittal Schedule.

2. Schedules, data and other documentation as described in detail in this section or referenced in the General Conditions.

3. Submittals as required in the detailed specifications.

4. Submittals not required will be returned without Engineer's review.

E. Submit a schedule indicating the date submittals will be sent to the Engineer and proposed dates that the product will be incorporated into the project. Make submittals promptly in accordance with the schedule so as to cause no delay in the project.

1. Submittals shall be sent to Engineer allowing a reasonable time for delivery, review and marking submittals. Time for review is to include time for resubmission if necessary and to allow adequate time for the ordering, fabrication, and delivery of the product.

2. Schedule submittal to provide all information for interrelated work at one time. No review will be performed on submittals requiring coordination with other submittals. Engineer will return submittals for resubmission as a complete package.

F. Installation of any products prior to the approval of shop drawings is done at the Contractors risk. Products not meeting the requirements of Contract Documents are defective and may be rejected at the Owners option.

G. Payment will not be made for products for which submittals are required until the submittals have been approved. Payment will not be made for products for which shop drawings or samples are required until these are approved by the Engineer.

1.03 QUALITY ASSURANCE

A. Submit legible, accurate, complete documents presented in a clear, easily understood manner. Submittals not meeting this criteria will be returned without review.

B. Demonstrate that the proposed products are in full and complete compliance with the design criteria and requirements of the Contract Documents including drawings and specifications as modified by Addenda, Field Orders and Change Orders.

C. Furnish and install products that fully comply with the information included in the submittal.

D. Review and approve submittals prior to submitting them to the Engineer for review. Submittals will not be accepted from subcontractors, suppliers, or anyone other than the Contractor.

1.04. OPERATION AND MAINTENANCE MANUAL

A. The Contractor shall obtain from the various Subcontractors various operation and maintenance data, replacement parts lists, maintenance schedule requirements, etc., and bind the information into a reference manual. Two sets shall be turned over to the Engineer/Architect prior to request for final payment.

B. Operation and maintenance manuals shall be neatly bound with each trade so indexed. In some cases, approved shop drawings and submittals may suffice for use in this regard. Equipment parts lists for replacement purposes shall be included wherever possible.

1.05 SUBMITTAL PROCEDURES

A. Deliver submittals to the Engineer.

B. Assign a number to the documents originated to allow tracking of the submittal during the review process.

1. Assign a number consisting of a prefix, a sequence number, and a letter suffix. Prefixes shall be as follows:

Prefix	**Description**	**Originator**
CO	Change Order	Contractor
CTR	Certified Test Report	Contractor
EIR	Equipment Installation Report	Contractor
FO	Field Order	Engineer
NBC	Notification by Contractor	Contractor
O&M	Operation & Maintenance Manuals	Contractor
PCM	Proposed Contract Modification	Engineer
PR	Payment Request	Contractor
PP	Project Photographs	Contractor
RD	Record Data	Contractor
RFI	Request for Information	Contractor
SAM	Sample	Contractor
SD	Shop Drawing	Contractor
SCH	Schedule of Progress	Contractor

2. Issue sequence numbers in chronological order for each type of submittal.

3. Issue numbers for re-submittals that have the same number as the original submittal followed by an alphabetical suffix indicating the number of times the same submittal has been sent to the Engineer for processing. For example: SD-025-A represents a shop drawing that is the twenty-fifth submittal of his type and is the second time this submittal

has been sent for review.

4. Clearly note the submittal number on each page or sheet of the submittal.

5. Correct assignment of numbers is essential since different submittal types are processed in different ways.

D. Submit documents with uniform markings and page sizes.

1. Paper size shall allow for ease of reproduction.

   a. Submit documents on 8-1/2" X 11" paper here practical.

   b. Use II' X 17" paper for larger drawings and schematics.

   c. Use full size blueline sheets for fabrications and layout drawings. Reproducible drawings may be submitted in lieu of bluelines.

2. Mark submittals to:

   a. Indicate Contractors corrections in green.
   b. Highlight items pertinent to the products being furnished in yellow and delete items that are not when the Manufacturers standard drawings or information sheets are provided.

   c. Cloud items and highlight in yellow where selections by the Engineer or Owner are required.

   d. Mark dimensions with the prefix FD to indicate field verified dimensions on the drawings.

   e. Provide a blank space 8" x 3" for Contractor's and Engineers stamp.

E. Mark submittals to reference the drawing number and/or section of the specifications, detail designation, schedule or location that corresponds with the data submitted. Other identification may also be required, such as layout drawings or schedules to allow the reviewer to determine where a particular product is to be used.

F. The number of copies of each submittal to be sent by the Contractor and the number of copies of each submittal to be returned are:

Prefix	Description	No. of Copies Sent	No. of Copies Returned
CO	Change Order	2	1
CTR	Certified Test Report	2	0
EIR	Equipment Installation Report	2	0
NBC	Notification by Contractor	2	1
O&M	Preliminary O&M Manuals	2	1
O&M	Final O&M Manuals	4	0
PR	Payment Request	2	1
PP	Project Photographs (including videotapes)	2	0
RD	Record Data	2	0
RFI	Request for Information	2	1
SAM	Sample	2	0
SD	Shop Drawings	3	1
SCH	Schedule of Progress	2	0

1.06 REVIEW PROCEDURES

A. Priority submittals will be reviewed before other submittals for this project which have been received but not reviewed.

1.07 REQUIREMENTS

A. Certifications. Warranties and Service Agreements include documents as specified in the detailed specifications as shown in the submittal schedule or as follows:

1. Certified Test Reports (CTR) - A report prepared by an approved testing agency giving results of tests performed on products to indicate their compliance with the specifications.

2. Certification of Local Field Service (CLS) - A certified letter stating that field service is available from a factory or supplier approved service organization located within a 300 mile radius of the project site. List names, addresses, and telephone numbers of approved service organizations on or attach to the certificate.

3. Extended Warranty (EW) - A guarantee of performance for the product or system beyond the normal one (1) year warranty described in the General Conditions, Issue the warranty certificate in the name of the Project Owner.

4. Extended Service Agreement (ESA) - A contract to provide maintenance beyond that required to fulfill requirements for warranty repairs, or to perform routine maintenance for a definite period of time beyond the warranty period. Issue the service agreement in

the name of the Project Owner.

5. Certification of Adequacy of Design (CAD) - A certified letter from the manufacturer of the equipment stating that they have designed the equipment to be structurally stable and to withstand all imposed loads without deformation, failure, or adverse effects to the performance and operational requirements of the unit. The letter shall state that mechanical and electrical equipment is adequately sized to be fully operational for the conditions specified or normally encountered by the product's intended use.

6. Certification of Applicator/Subcontractor (CSQ) - A certified letter stating that the Applicator or Subcontractor proposed to perform a specified function is duly designated as factory authorized and trained for the application of the specified product.

B. Submit record data to provide information to allow the Owner to adequately identify the products incorporated into the project and allow replacement or repair at some future date.

1. Provide record data for all products. Record data is not required for items for which shop drawings and/or operations and maintenance manuals are required.

2. Provide information only on the specified products. Submit a Contractor's Modification Request for approval of deviations or substitutions and obtain approval by Field Order or Change Order prior to submitting Record Data.

3. Record data will be received by the Engineer, logged, and provided to Owner for his/her record.

a. Record data may be reviewed to see that the information provided is adequate for the purpose intended. Inadequate drawings may be returned as unacceptable.

b. Record data is not reviewed for compliance with the Contract Documents. Comments may be returned if deviations from the Contract Documents are noted during the cursory review performed to see that the information is adequate.

1.08 REQUESTS FOR DEVIATION

A. Submit requests for deviation from the Contract Documents for any product that does not fully comply with the specifications.

B. Submit request by Contractor's Modification Request (CMR) per Section 01040. PROJECT ADMINISTRATION. Identify the deviations and the reason the change is requested.

C. Deviations that result in a reduction in cost shall also include the amount of the reduction to the Owner.

D. A Change Order or Field Order will be issued by the Engineer for deviations approved by the Owner. Deviations from the Contract Documents may only be approved by Change

Order or Field Order.

1.09 SUBMITTALS FOR SUBSTITUTIONS

A. Substitutions are defined as any product that the Contractor proposes to provide for the Project in lieu of the specified product.

B. If the Contractor desires to submit a manufacturer or product which is not specified, the Contractor must submit the following for consideration of approval of the substitution:

1. Contractor's Modification Request for deviation from the Contract Documents per Paragraph 1 .07.
2. Prove that the product is acceptable as a substitute. It is not the Engineers responsibility to prove the product is not acceptable as a substitute.

    a. Indicate on a point by point basis for each specified feature that the product is acceptable to meet the intent of the Contract Documents requirements.

    b. Make a direct comparison with the specified manufacturers published data sheets and available information. Provide this printed material with the submittal.

    c. The decision of the Engineer regarding the acceptability of the proposed substituted product is final.

3. Provide a typewritten certification that, in making the substitution request. The Contractor:

    a. Has determined that the substituted product will perform in substantially the same manner and result in the same ability to meet the specified performance as the specified product.

    b. Will provide the same warranties and/or bonds for the substituted product as specified or as would be provided by the Manufacturer of the specified product.

    c. Will assume all responsibility to coordinate and modifications that may be necessary to incorporate the substituted product into the project and will waive all claims for additional work which may be necessary to incorporate the substituted product into the project which may subsequently become apparent.

    d. Will maintain the same time schedule as for the specified product.

1.10 GUARANTEES

A. Warranties and guarantees shall be submitted as required by the Contract Documents and submitted with the shop drawings or record data.

1.11 RESUBMISSION REQUIREMENTS

A. Make all corrections or changes in the submittals required by the Engineer and resubmit until approved.

B. Need for more than one resubmission or any other delay of obtaining Engineer's review of submittals, will not entitle the Contractor to an extension of Contract Time. All costs associated with such delays shall be at the Contractor's expense.

1.12 ENGINEER'S DUTIES

A. Revise the submittals and return with reasonable promptness.

B. Affix stamp, indicate approval with or without comments, rejection, and the need for re-submittal.

C. Distribute documents.

SUBMITTAL SCHEDULE

Spec. No.	Description	SD	SAM	CTR	CLS	EW	ESA	CAD	CSQ	RD	OM	EIR	PPB
01568	Erosion and Sediment Control during Construction									X			
01600	Products							X				X	
01650	Starting Systems										X	X	
01700	Contract Closeout									X			
01730	Operations and Maintenance Manual										X		
02556	Water Transmission Lines and/or Pressure Sewer Lines	X								X			
02570	Sanitary Sewer	X								X			
02575	Paving Repair and Resurfacing									X			
02590	Polyurthane Protective Coating									X			
03300	Cast in Place Concrete									X			
09101	Construction Traffic Control									X			
02223	Trench Protection System									X			
02236	Embankment		X							X			
02601	Flex base		X	X						X			
02610	Prime Coat		X	X						X			
02612	HMAC		X	X						X			

SD - Shop Drawing
SAM - Sample
CTR - Certified Test Report
CLS - Certification of Local Field Service
EW - Extended Warrant
ESA - Extended Service Agreement
PPB - Process Performance Bond
CAD - Certificate of Adequacy of Design
CSQ- Certification of Applicator/ Subcontractor Qualifications
RD - Record Data
OM - Operation and Maintenance Manuals
EIR - Equipment Installation Report

END OF SECTION

SECTION 01411

ENVIRONMENTAL PROTECTION

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

The contractor shall perform the work minimizing environmental pollution and damage as the result of construction operations. Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the utility of the environment for aesthetic, cultural and/or historical purposes. The control of environmental pollution and damage requires consideration of land, water, and air, and includes management of visual aesthetics, noise, solid waste, as well as other pollutants. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract.

A. SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

B. PERMITS

The Contractor shall obtain all needed permits or licenses. The Owner will not obtain any permits for this project, See General Provision 408, PERMITS AND RESPONSIBILITIES. The Environmental Protection Agency (EPA), through the national pollutant discharge elimination system (NPDES), requires general permits, a notice of intent, and a notice of discontinuation. The Contractor shall be responsible for implementing the terms and requirements of the appropriate permits as needed and for payment of all fees.

B. PRECONSTRUCTION SURVEY

Prior to starting any onsite construction activities, the Contractor and Owner shall make a joint condition survey, after which the Contractor shall prepare a brief report indicating on a layout plan the condition of trees, shrubs, and grassed areas immediately adjacent to work sites and adjacent to the assigned storage area and access routes as applicable. This report will be signed by both the owner and the Contractor upon mutual agreement as to its accuracy and completeness.

C. MEETINGS

The Contractor shall meet with representatives of the Owner to change the environmental protection plan as needed for compliance with the environmental pollution control program.

D. NOTIFICATION

The Owner will notify the Contractor in writing of any observed noncompliance with the previously mentioned Federal, State or local laws or regulations, permits, and other elements of the Contractor's environmental protection plan. The Contractor shall, after receipt of such notice, inform the Owner of proposed corrective action and take such action when approved. If the Contractor fails to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or costs or damages allowed to the Contractor for any such suspensions.

E. PREVIOUSLY USED EQUIPMENT

The Contractor shall thoroughly clean all construction equipment previously used at other sites before it if brought into the work areas, ensuring that soil residuals are removed.

F. PAYMENT

No separate payment will be made for work covered under this section; all costs associated with this section shall be included in the contract unit and/or lump sum prices in the Bidding Schedule.

1.02 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify the land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without permission. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such emergency use in permitted, the Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, earth or other material displaced into uncleared areas shall be removed.

A. WORK AREA LIMITS

Prior to any construction, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are to be saved and protected shall also be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

B. LANDSCAPE

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. Fencing shall be erected at sufficient distance from a tree trunk (usually equal to the diameter of the tree crown) to prevent compaction of soil over the root spread.

C. UNPROTECTED ERODIBLE SOILS

Earthwork brought to final grade shall be finished as indicated. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Except in cases where the constructed feature obscures borrow areas, quarries, and waste material areas, these areas shall not initially be totally cleared. Clearing of such areas shall progress in reasonably sized increments as needed to use the developed areas as approved by the Owner.

D. DISTURBED AREAS

The Contractor shall effectively prevent erosion and control sedimentation through approved methods including, but not limited to, the following:

1. Retardation and control of runoff. Runoff from the construction site or from storms shall be controlled, retarded, and diverted to protected drainage courses by means of diversion ditches, benches, berms, and by any measures required by area wide plans under the Clean Water Act.

2. Erosion and sedimentation control devices. The Contractor shall construct or install temporary and permanent erosion and sedimentation control features as indicated on the drawings. Berms, dikes, drains, sedimentation basins, grassing, and mulching shall be maintained until permanent drainage and erosion control facilities are completed and operative.

3. Sediment basins. Sediment from construction areas maybe trapped in temporary or permanent sediment basins in accordance with the drawings. The basins shall accommodate the runoff of a local 5 year storm (6.1” in 24 hours). After each storm, the basins shall be pumped dry and accumulated sediment shall be removed to maintain basin effectiveness. Overflow shall be controlled by paved weirs or by vertical overflow pipes. The collected topsoil sediment shall be reused for fill on the construction site, and/or stockpiled for use at another site. The Contractor shall institute effluent quality monitoring programs as requested by State and local environmental agencies.

4. De-watering of site and control of water quality. All water discharged from any excavation will be deposited at approved locations only. The Contractor will monitor

water quality and not dispose of any material illegally. De-watering methods will be included in the Contractor's SWPPP.

E. CONTRACTOR FACILITIES AND WORK AREAS

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Owner. Temporary movement or relocation of Contractor facilities shall be made only when approved. Borrow areas shall be managed to minimize erosion and to prevent sediment from entering nearby waters. Spoil areas shall be managed and controlled to limit spoil intrusion into areas designated on the drawings and to prevent erosion of soil or sediment from entering nearby waters. Spoil areas shall be developed in accordance with the grading plan indicated on the drawings. Temporary excavation and embankments for plan and/or work areas shall be controlled to protect adjacent areas from despoilment.

1.03 WATER RESOURCES

The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation when such application may cause contamination of the fresh water reserve. Monitoring of water areas affected by construction shall be the Contractor's responsibility. All water areas affected by construction activities shall be monitored by the Contractor.

A. WASHING AND CURING WATER

Waste waters directly derived from construction activities shall not be allowed to enter stormwater or wastewater facilities.

B. FISH AND WILDLIFE

The Contractor shall minimize interference with, disturbance to, and damage of fish and wildlife.

1.04 AIR RESOURCES

Equipment operation and activities or processes performed by the Contractor in accomplishing the specified construction shall be in accordance with the State of Texas rules and all Federal emission and performance laws and standards. Ambient Air Quality Standards set by the Environmental Protection Agency shall be maintained. Monitoring of air quality, if required, shall be the Contractor's responsibility. All air areas affected by the construction activities shall be monitored by the Contractor. Monitoring results will be periodically reviewed by the Owner to ensure compliance.

A. PARTICULATES

Dust particles, aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; shall be controlled at all times,

including weekends, holidays and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, light bituminous treatment baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor mush have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs.

B. HYDROCARBONS AND CARBON MONOXIDE

Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to Federal and State allowable limits at all times.

C. ODORS

Odors shall be controlled at all times for all construction activities, processing and preparation of materials.

D. SOUND INTRUSIONS

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the City ordinances.

1.05 WASTE DISPOSAL

Disposal of wastes shall be shall comply with all applicable City requirements and as specified below.

A. SOLID WASTES

Solid wastes (excluding clearing debris) shall be placed in containers are emptied on a regular schedule. Handling and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. Contractor shall dispose of classified non-hazardous solid waste at disposal area. The Contractor shall comply with Federal, State, and local laws and regulations pertaining to the use of landfill areas.

B. HAZARDOUS WASTES

The Contractor shall take sufficient measures to prevent spillage of hazardous materials during dispensing and collect waste in suitable containers observing compatibility. Toxic materials shall not be used within the construction site. The Contractor shall immediately transport hazardous waste and dispose of it in compliance with Federal and local laws and regulations. Storage of hazardous waste on the construction site is prohibited. Spills of hazardous materials shall be immediately reported to the Owner. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility.

C. BURNING

Burning will not be allowed.

1.06 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Existing historical, archaeological, and cultural resources within the Contractor's work area will be so designated by the Owner, if any has been identified. The Contractor shall take precautions to preserve all such resources as they existed at the time they were first pointed out. The Contractor shall provide and install protection for these resources and be responsible for their preservation during the life of the contract. If during excavation or other construction activities any previously unidentified or unanticipated resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone charcoal, or other deposits; rocks or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Owner. While waiting for instructions the Contractor shall record, report, and preserve the finds in accordance with the requirements of the Texas State Historical Preservation Office.

1.07 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction.

1.08 RESTORATION OF LANDSCAPE DAMAGE

The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work areas at no costs to the OWNER.

1.09 MAINTENANCE OF ANTI-POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

1.10 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental pollution control.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01460

LABORATORY TESTING AND INSPECTION SERVICES

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. This item shall consist of all required testing and inspection services required to provide certification that the completed construction is in substantial compliance with the contract, plans and specifications.

B. Testing and inspections shall include: all underground utilities (water, sewer & drainage), roadway embankment, subgrade, base & asphalt, curbs of all types, concrete pavements, concrete structures, signage, striping, and all other facilities as may be included in the overall scope of construction.

C. Inspections may include observations to determine compliance with the prescribed stormwater pollution prevention plan (SW3P), trench safety, personal protection equipment and traffic control plans.

D. The ENGINEER has the authority to observe, test, inspect, approve, and accept the work. The ENGINEER decides all questions about the quality and acceptability of materials, work performed, work progress, Contract interpretations, and acceptable Contract fulfillment. The ENGINEER has the authority to enforce and make effective these decisions.

E. The ENGINEER acts as a referee in all questions arising under the terms of the Contract. The ENGINEER's decisions will be final and binding.

PART 2 – PRODUCTS (not used)

PART 3 - EXECUTION

3.01 LABORATORY TESTING

A. All required laboratory testing shall be completed by an independent, qualified testing laboratory approved by the CITY. All initial testing shall be paid for by the CITY. Any retesting required shall be paid for by the CONTRACTOR.

B. Cost for additional review time will be billed to the CONTRACTOR by the OWNER for the actual hours required for the re-testing in accordance with the current rates as established by the contract between the CITY and the Testing Lab. Cost for the additional review shall be paid to the OWNER by the CONTRACTOR on a monthly basis.

3.02 INSPECTIONS

A. PROVIDERS: All required inspections shall be provided by either the independent testing laboratory or by the City of McAllen Engineering department staff. All initial inspections conducted during normal business hours (8:00 am to 5:00 pm, Monday – Friday, excluding Holidays) shall be provided by the CITY at no charge. Any inspections or testing requested by the CONTRACTOR to be provided at any other time will be paid for by the CONTRACTOR. Any re-inspections or re-testing required shall be paid for by the CONTRACTOR.

B. COSTS: Cost for additional review time will be billed to the CONTRACTOR by the OWNER for the actual hours required for the retesting in accordance with the current rates as established by the contract between the CITY and the Testing Lab. Cost for the additional review shall be paid to the Owner by the CONTRACTOR on a monthly basis.

C. INSPECTORS: Inspectors are authorized representatives of the ENGINEER. Inspectors are authorized to examine all work performed and materials furnished, including preparation, fabrication, and material manufacture. Inspectors inform the CONTRACTOR of failures to meet Contract requirements. Inspectors may reject work or materials and may suspend work until any issues can be referred to and decided by the ENGINEER. Inspectors cannot alter, add, or waive Contract provisions, issue instructions contrary to the Contract, act as foremen for the CONTRACTOR, or interfere with the management of the work. Inspection or lack of inspection will not relieve the CONTRACTOR from obligation to provide materials or perform the work in accordance with the Contract. CONTRACTOR shall provide safe access to all parts of the work and provide information and assistance to the ENGINEER to allow a complete and detailed inspection and give the ENGINEER sufficient notice to inspect the work. Work performed without suitable inspection, as determined by the ENGINEER, may be ordered removed and replaced at CONTRACTOR's expense. CONTRACTOR shall remove or uncover portions of finished work as directed. Once inspected, restore work to Contract requirements. If the uncovered work is acceptable, the costs to uncover, remove, and replace or make good the parts removed will be paid for in accordance "Changes in the Work." If the work is unacceptable, CONTRACTOR shall assume all costs associated with repair or replacement, including the costs to uncover, remove, and replace or make good the parts removed. When a government entity, utility, railroad company, or other entity accepts or pays a portion of the Contract, that organization's representatives may inspect the work but cannot direct the CONTRACTOR. The right of inspection does not make that entity a party to the Contract and does not interfere with the rights of the parties to the Contract.

D. FINAL INSPECTION: After all work is complete, the CONTRACTOR will request a final inspection by the ENGINEER authorized to accept the work. The final inspection will be made as soon as possible, and not later than 10 calendar days after the request. No working day charges will be made between the date of request and

final inspection. After the final inspection, if the work is satisfactory, the ENGINEER will notify the CONTRACTOR in writing of the final acceptance of the work. If the final inspection finds any work to be unsatisfactory, the ENGINEER will identify in writing all deficiencies in the work requiring correction. Correct the deficiencies identified. Working day charges will resume if these deficiencies are not corrected within 7 calendar days, unless otherwise authorized by the ENGINEER. Upon correction, the ENGINEER will make an inspection to verify that all deficiencies were corrected satisfactorily. The ENGINEER will provide written notice of the final acceptance.

3.03 SCHEDULING

A. It shall be the CONTRACTOR'S responsibility to contact either the testing lab or the City of McAllen Engineering staff at least 48 hours before the required testing or inspection is to occur.

B. It shall be the CONTRACTOR'S responsibility to plan the construction in such a manner to allow the appropriate tests and inspections to be conducted without disruption to the construction process.

3.04 PREPARATION

A. CONTRACTOR shall be responsible for preparing the project site as necessary to conduct all required testing. This shall include, but may not be limited to: proper grading of construction site, completion of required compaction activities, complete installation of all forms, installation of all required reference points (grade stakes), provision of adequate traffic control, additional personnel and/or supplies and all necessary safety measures (i.e. OSHA compliant Trench Safety) as needed.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. This work shall be considered incidental to the completion of the project and no additional compensation shall be paid for this work.

4.02 PAYMENT

A. No separate payment shall be made for this item.

END OF SECTION

SECTION 01564

GROUND WATER HANDLING

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Dewatering, depressurizing, draining, and maintaining trenches, shaft excavations, structural excavations, and foundation beds in a stable condition, and controlling ground water conditions for tunnel excavations.

B. Protecting work against surface runoff and rising flood waters.

C. Disposing of removed water.

1.02 REFERENCES:

A. Federal Regulations, 29 CFR Part 1926, Standards-Excavation, Occupational Safety and Health Administration (OSHA).

B. Federal Register 4O CFR (Vol. 53. No. 222) Part 122, EPA Administrator permit Programs (NPDES), Pam 122.26 (b) (l4) Storm Water Discharge.

1.03 DEFINITIONS:

A. Ground water control includes both dewatering and depressurization of water-bearing soil layers using well points, for either vacuum or educator systems, or deep wells. Use of sump pumps does not constitute ground water control.

1. Dewatering is lowering the water table and intercepting seepage which would otherwise emerge from slopes or bottoms of excavations or into tunnels and shafts, and disposing of removed water.

2. Depressurization is reduction of piezometric pressure within a soil strata not controlled by dewatering alone.

B. Control of excavation drainage by sump pumping includes operating the sump pump and drainage facilities installed to collect water in the sump.

C. Control of surface drainage is diversion of surface water away from excavations.

1.04 PERFORMANCE REQUIREMENTS:

A. Conduct subsurface investigations as needed to identify ground water conditions and

to provide parameters for installation and operation of ground water control systems. Perform pump tests, if necessary, to determine drawdown characteristics of water bearing layers.

B. Develop a ground water control system, compatible with requirements of Federal Regulations 29 CER Part 1926, to produce the following results:

1. Reduce hydrostatic pressure affecting excavations to the following levels as determined by piezometer observations.

a. For structural excavations, reduce the piezometric level to at least 3 feet below the excavation bottom elevation or within 2 feet above the top of clay layers.

b Where hydrostatic pressure in a confined water-bearing layer exist below the excavation, depressurize this zone to eliminate risk of uplift or other instability of the excavation or installed works.

2. Develop stable subgrade for subsequent construction operations.

3. Reduce hydrostatic pressure for tunnel excavations as necessary to maintain face stability, grade control, and to control seepage into tunnel

C. Provide drainage of seepage water and surface water, as well as water from any other source entering the excavation. Excavation drainage may include placement of drainage materials such as crushed stone and filter fabric, together with sump pumping

D. Locate ground water control and drainage systems so as not to interfere with utilities, construction operations, adjacent properties, or adjacent water wells

E. Modify ground water control systems or operations if they cause or threaten to cause damage to new construction, existing site improvements, adjacent property, or adjacent water wells, if they affect potentially contaminated areas

1.05 SUBMITTALS:

1.06 ENVIRONMENTAL REQUIREMENTS:

A. Comply with the Texas Commission on Environmental Quality regulations and Texas Water Well Driller Association for development, drilling, and abandonment of wells used in dewatering system.

B. Where potentially contaminated areas are indicated on the Drawings, monitor ground water discharge for contamination in accordance with the Project Engineer’s instructions.

PART 2 - PRODUCTS

2.01 EQUIPMENT AND MATERIALS

A. Equipment and materials are at the option of Contractor as necessary to achieve desired results for ground water control. Ground water control systems may include single-stage or multiple-stage well point systems, educator and ejector-type systems, deep wells, or combinations of these equipment types. Excavation drainage and surface drainage may also include sump pumping subsidiary to bid item.

B. Maintain equipment in good repair and operating order.

C. Arrange for standby equipment and materials where required.

PART 3 - EXECUTION

3.01 GROUND WATER CONTROL

A. Install, operate and maintain the ground water control system in a manner compatible with construction methods and site conditions. Notify Project Engineer in writing of any changes made to accommodate field conditions and changes to the Work.

B. For above ground piping in ground water control system, include a length of clear transparent piping between every well point and discharge header so that discharge from each installation can be visually monitored.

C. Replace installations that produce noticeable amounts of sediments after development.

D. Provide additional ground water control installations, or change the methods, if the installation does not achieve satisfactory results.

E. Do not allow piezometric pressure levels to rise until foundation concrete has achieved design strength.

F. During backfilling, dewatering may be reduced to maintain water level a minimum of S fret below prevailing level of backfill. However, do not allow that water level to result in uplift pressures in excess of 80 percent of downward pressure produced by weight of structure or backfill in place.

G. Remove ground water control installations.

1. Remove pumping system components and piping when ground water control is no longer required.
2. Remove monitoring wells when directed by the Project Engineer.

3. Grout abandoned well. Fill piping that is not removed with cement-bentonite grout or cement-sand grout.

3.02 MAINTENANCE AND OBSERVATION

A. Conduct daily maintenance and observation of the ground water control systems.

B. Replace inoperable or damaged system components as necessary to maintain operation.

C. Keep monitoring system piping accessible for observation,

3.03 MONITORING AND RECORDING

A. Observe and record elevation of water level daily as long as ground water control system is in operation. Observe levels weekly thereafter until the Work is completed or piezometers or wells are removed. Initiate more frequent observation when the Project Engineer determines that more frequent monitoring and recording are required.

3.04 SURFACE WATER CONTROL

A. Intercept surface water and divert it away from excavations. This includes temporary works required to protect adjoining properties from surface drainage caused by construction operations.

B. Drive surface water and seepage water into sumps and pump it into drainage channels, setting basins, or storm drains.

END OF SECTION

SECTION 01568

EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

PART 1 - GENERAL

1.01 WORK INCLUDED

Furnish labor, materials, equipment and incidentals necessary to provide erosion and sediment control for the duration of the construction period including furnishing, installing and maintaining erosion and sediment control structures and procedures and the proper removal when no longer required.

The intent of this specification is to provide guidelines for the Contractor to adhere to all State, Federal, and Local environmental regulations. It is also the intent to provide preventive measures to keep sediment from entering any storm water system, including open channels. It is the Contractor's responsibility to adhere to all State, Federal and Local requirements. While the Owner may require the Contractor to install erosion control devices during construction, this will in no way relieve the Contractor of his responsibility.

1.02 QUALITY ASSURANCE

A. Comply with applicable requirements of all governing authorities having jurisdiction. The Specifications and the Plans are not represented as being comprehensive, but rather to convey the intent to provide complete slope protection and erosion control for both the Owner's and adjacent property.

B. Erosion control measures shall be established at the beginning of construction and maintained during the entire length of construction. On-site areas which are subject to severe erosion and off-site areas which are especially vulnerable to damage from erosion and/or sedimentation are to be identified and receive additional erosion control measures as directed by the Owner or the Engineer.

C. All land-disturbing activities shall be planned and conducted to minimize the size of the area to be exposed at any one time and to minimize the time of exposure.

D. Surface water runoff originating upgrade of exposed area shall be controlled to reduce erosion and sediment loss during the period of exposure.

E. When the increase in the peak rates and velocity of storm water runoff resulting from a land-disturbing activity is sufficient to cause accelerated erosion of the receiving ditch or stream, the Contractor shall install measures to control both the velocity and rate of release so as to minimize accelerated erosion and increased sedimentation of the stream as directed by the Owner or the Engineer.

F. All land-disturbing activities shall be planned and conducted so as to minimize off-site sedimentation damage.

C. The Contractor shall be responsible for periodically cleaning out and disposing of all sediment once the storage capacity of the drainage feature or structure receiving the sediment is reduced by one-half. The Contractor shall also be responsible for cleaning out and disposing of all sediment at the time of completion of the Work.

1.03 SUBMITTALS

Submittals shall be in accordance with Section 01300, SUBMITTALS, and shall include:

A. Manufacturer's Literature: Descriptive data of installation methods and procedures.
B. Certificates: Manufacturer's certification that materials meet specification requirements.

1.04 JOB CONDITIONS; CODES AND ORDINANCES

Comply with the local codes and ordinances. If local codes and ordinances require *more* stringent or additional erosion and sediment control measures during construction, Contractor shall provide such measures.

PART 2 - PRODUCTS

2.01 MATERIALS

A. STRAW BALES: Straw bales shall weigh a minimum of fifty (50) pounds and shall be at least 30" in length. Bales shall be composed entirely of vegetable matter and be free of seeds. Binding shall be either wire or nylon string. Jute or cotton binding is unacceptable. Bales shall be used for not more than three months before being replaced. However, if weather conditions cause biological degradation of the straw bales, they shall be replaced sooner than the three month time period to prevent a loss of structural integrity of the dike.

B. SILT FENCE: Silt fence fabric shall be a nylon reinforced polypropylene fabric which has a built-in cord running the entire length of the top edge of the fabric. The fabric must meet the following minimum criteria:

Tensile Strength, ASTM D4632	90 lbs.
Puncture Rating, ASTM D4833	60 lbs.
Mullen Burst Rating, ASTM D3786	200 psi.
Apparent Opening Size, U.S. Sieve No. 40	

Silt fence shall be "Enviro Fence" preassembled silt fence, AMXCO Silt Stop prefabricated silt fence, AMOCO Style 2155 preassembled silt fence or approved equal.

C. SILT FENCE POSTS: A minimum 2" x 2" (nominal) x 54" pressure treated wood posts of Number 2 Grade southern yellow pine or approved equal.

D. SAND BAG: Sand bag material shall be polypropylene, polyethylene, polyamide or cotton burlap woven fabric, minimum unit weight four (4) ounces per square yard, mullen burst

strength exceeding 300 psi and ultraviolet stability exceeding 70%. Length shall be 24 to 30 inches, width shall be l6 to 18 inches and thickness shall be six (6) to eight (8) inches and having an approximate weight of 40 pounds. Sand bags shall be filled with coarse grade sand, free from deleterious material. All sand shall pass through a No. 10 sieve.

E. P.V.C. PIPE: Pipe shall be SDR-35 polyvinyl chloride having a minimum nominal internal diameter of 4". Pipes shall be sized for anticipated flows.

F. SOIL RETENTION BLANKET: Soil retention blankets shall consist of a geocomposite of excelsior or fiber blanket with an extruded plastic net attached to the top side. The plastic net shall be photodegradable and the excelsior or fiber blanket shall be made smolder resistant without the use of chemicals. Soil retention blankets shall be high velocity type to resist severe runoff. The soil retention blanket shall be one (1) of the following classes and types:

1. Class 1. "Slope Protection"

   (a) Type A. Slopes of 3:1 or flatter-Clay soils

   (b) Type B. Slopes of 3:1 or flatter - Sandy soils

   (c) Type C. Slopes steeper than 3:1 - Clay soils

   (d) Type D. Slopes steeper than 3:1 - Sandy soils

2. Class 2. "Flexible Channel Liner"

   (a) Type E. Short-term duration (Up to 2 Years)
   Shear Stress (t_d) <1.0 lb. /sq. ft.

   (b) Type F. Short-term duration (Up to 2 Years)
   Shear Stress (t_d) 1.0 to 2.0 lb. /sq. ft.

   (c) Type C. Long-term duration (Longer than 2 Years)
   Shear Stress (t_d)> 2.0 to < 5.0 lb. /sq. ft.

   (d) Type H. Long-term duration (Longer than 2 Years)
   Shear Stress (t_d) greater than 0 equal to 5.0 lb/sq. ft.

The Contractor has the option of selecting an approved soil retention blanket provided that selection conforms to the following list of approved soil retention blankets for slope protection applications:

CLASS I. SLOPE PROTECTION

TYPE A: Slopes of 3: I or Flatter- Clay Soils

Airtrol® ANTI-WASH®/GEOJUTE® (Regular)
Contech Standards®
Contech Standards Plus®
Green Triangle Regular®
Green Triangle Superior®
GREENSTREAK® PEC MAT
Curlex®
North American Green® S150
North American Green® S75
North American Green® SC 150
POLYJUTEÔ 4O7/GT
SOIL SAVER®
TerraJute®
Verdyol® ERO-MAT®
Xcel Regular®
Xcel Superior®

TYPE B: Slopes of 3:1 or Flatter-Sandy Soils

Contech Standards®
Contech Standards Plus®
GEOCOIR®/DEKOWE® 700
Green Triangle Superior®
Green Triangle Regular®
North American Green® 575
North American Green® SC 150
North American Green® S150
POLYJUTEO 407/CT
TerraJute®
Verdyol® ERO-MAT®
XceI Superior®
XceI Regular®

TYPE C: Slopes Steeper than 3:1-Clay Soils

Airtrol®
ANTI-WASH®/GEOJUTE® (Regular)
Contech Standards Plus®
Curlex®
Green Triangle Superior®
GREENSTREAK® PEC-MAT
North American Green® SC 150
North American Green® S150
POLYJUTEÔ 407/CT
SOIL SAVER®
TerraJute®

Xcel Superior®

TYPE D: Slopes Steeper than 3:1-Sandy Soils

Contech Standards Plus®
GEOCOIR®/DEKOWE®700
Green Triangle Superior®
North American Green®S150
North American Green®SC150
POLYJUTEÔ 407GT
TerraJute®
Xcel Superior®

CLASS II: FLEXIBLE CHANNEL LINER PROTECTION

PART 3 - EXECUTION

3.01 PREPARATION

A. Contractor shall prepare the site for installation of the erosion and sediment control devices in accordance with the manufacturer's recommendations when applicable. At all times, CONTRACTOR, shall take extreme care during the installation of the applicable devices to minimize disturbance of the project site.

3.02 INSTALLATION

A. TEMPORARY STRAW BALE DIKE

1. Straw bales shall be embedded a minimum of 4" and securely anchored using 2" x 2" wood stakes driven through the bales into the ground a minimum of 6" Straw bales are to be placed directly adjacent to one another leaving no gap between them.

2. Bales shall be placed in a single row, lengthwise on proposed line, with ends of adjacent bales tightly abutting one another. In swales and ditches, the barrier shall extend to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale. Additional bales shall be placed behind the first row where the bales abut each other. The additional bale is used to prevent unfiltered runoff from escaping between the bales.

3. The-excavated soil shall be backfilled against the barrier. Backfill shall conform to ground level on the downhill side and shall be built up to 4" above ground level on the uphill side. Loose straw shall be scattered over the area immediately uphill from a straw barrier.

B. SILT FENCE

The purpose of a silt fence is to intercept and detain water-borne sediment from unprotected

areas to a limited extent. The Contractor shall excavate a 6 inch wide by 6 inch deep trench for site fence bedding along the lower perimeters of the site where necessary to prevent sediment from entering any drainage system. The Contractor shall install the silt fence in accordance with the manufacturer's recommendations and instructions. Silt fence is used during the period of construction near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. This fence shall remain in place until the disturbed area is permanently stabilized. Silt fence should not be used where there is a concentration of water in a channel or drainage way or where soil conditions prevent a minimum toe-in depth of 6" or installation of support post to depth of 12". Fabric shall overlap at abutting ends a minimum of 3' and shall be jointed such that no leakage or bypass occurs. If concentrated flow occurs after installation, corrective action must be taken such as placing rock berm in the areas of concentrated flow.

C. SAND BAG BERM

1. The purpose of a sandbag berm is to intercept sediment-laden water from disturbed areas such as construction in steam beds, create a retention pond, detain sediment and release water in sheet flow.

2. A temporary sand bag berm shall be installed across a channel or right of way in a developing or disturbed area and should be used when the contributing drainage area is greater than 5 acres. The berm shall be a minimum height of 18", measured from the top of the existing ground at the upslope toe to the top of the berm. The berm shall be sized to have a minimum width of 48" measured at the bottom of the berm and 18" measured at the top of the berm.

3. The sand bag berm shall be inspected after each rain. The sand bags shall be reshaped or replaced as needed during inspection. Additional inspections shall be made daily by the responsible party and when the silt reaches 6", the accumulated silt shall be removed and disposed of at an approved site in a manner that will not contribute to additional siltation. The sand bag berm shall be left in place until all upstream areas are stabilized and accumulated silt removed; removal must be done by hand.

D. SOIL RETENTION BLANKETS

1. A soil retention blanket (SRB) is a geotextile or biodegradable fabric placed over disturbed areas to limit the effects of erosion due to rainfall impact and runoff across barren soil. Soil retention blankets are manufactured by a wide variety of vendors addressing a wide variety of conditions such as vegetation establishment and high velocity flow. Blankets are used in areas which are difficult to stabilize such as steep slopes, drainage swales or high pedestrian traffic areas.

2. The soil retention blanket, whether installed as slope protection or as flexible channel liner, shall be placed within 24 hours after seeding or sodding operations have been completed, or as approved by the Engineer. Prior to placing the blanket, the area to be covered shall be relatively free of all rocks or clods over 1-1/2" in maximum dimension and all sticks or other foreign material which will prevent the close contact of the blanket with the soil. The area

shall be smooth and free of ruts and other depressions. If as a result of rain, the prepared bed becomes crusted or eroded or if any eroded places, ruts or depressions exist for any reason, the Contractor shall be required to rework the soil until it is smooth and to reseed or resod the area at the Contractor's expense.

3. Installation and anchorage of the soil retention blanket shall be in accordance with the manufacturer's recommendations.

E. PROTECTION OF BARE AREAS

1. Apply seeding and soil retention blanket to bare areas including new embankment areas, fills, stripped areas, graded areas or otherwise disturbed areas, which have a grade greater than *5%* or which will be exposed for more than 30 days.

2. Bare working areas on which it is not practical or desirable to install seeding and soil retention blankets, as determined by the Engineer, such as areas under proposed building slabs, shall be temporarily sloped to drain at a minimum of 0.2% and a maximum of 5% grade. These areas shall then be "track walked" with a crawler dozer traveling up and down the slope to form the effect of small "terraces" with the tracks of the dozer. Apply a minimum of three (3) coverages to each area with the dozer tracks,

3. Route runoff from the areas through the appropriate silt fence system.

4. Protect earth spoil areas by "trackwalking" and silt fences.

F. INTERCEPTOR SWALE

1. Interceptor swales may have a v-shape or be trapezoidal with a flat bottom and side slopes of 3:1 or flatter. These are used to shorten the length of exposed slope by intercepting runoff and can also serve as perimeter swales preventing off-site runoff from entering the disturbed area or prevent sediment-laden runoff from leaving the construction site or disturbed area. The outflow from a swale must be directed to a stabilized outlet or sediment trapping device. The swales should remain in place until the disturbed area is permanently stabilized.

2. Stone Stabilization shall be used when grades exceed 2% or velocities exceed 6 feet per second and shall consist of a layer of crushed stone *3"* thick, or flexible channel liner soil retention blankets. Stabilization shall extend across the bottom of the swale and up both sides of the channel to minimum height of 6 inches above the design water surface elevation based on a two year storm.

3. An interceptor swale shall be installed across exposed slopes during construction and should intercept no more than five *(5)* acres of runoff. Swales shall have a minimum bottom width of 2'-0" and a maximum depth of 1'-6" with side slopes of 3 :1 or flatter. Swale must have positive drainage for its entire length to an outlet. When the slope exceeds 3%, or velocities exceed 4 feet per second (regardless of slope), stone stabilization is required. Check dams

are also recommended to reduce velocities in the swales possibly reducing the amount of stabilization necessary. Swales should be inspected on a weekly basis during wet weather and repairs should be made promptly to maintain a consistent cross section.

4. All trees, brush, stumps, obstructions and other material shall be removed and disposed of so as not to interfere with the proper functioning of the swale.

5. The swale shall be excavated or shaped to line, grade, and cross-section as required to meet criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.

6. All earth removed and not needed in construction shall be disposed of in an approved spoils site so that it will be conveyed to a sediment trapping device.

7. Diverted runoff from a disturbed or exposed upland area shall be conveyed to a sediment trapping device.

8. The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet.

9. Minimum compaction for the swale shall be 90% standard proctor.

G. LOCATION OF EROSION AND SEDIMENT CONTROL STRUCTURES

1. Locate erosion and sediment control structures as required to prevent erosion and removal of sediment from the project site. Silt fences shall be required for disturbed areas and soil stockpiles/spoil areas. Each silt fence installation shall have a minimum net length (exclusive of embedments into diversion dikes or other ineffective areas) of 25 feet. The runoff from a maximum of one (1) acre of disturbed area or soil stockpile/ spoil area shall be routed through any individual silt fence installation.

2. lnstall diversion dikes to divert runoff to the silt fence installation.

3. Install silt traps at the inlet (upstream) end of the drainage structures, including open channels, through which runoff from disturbed areas or soil stockpiles/spoil areas may drain.

4. Provide an overall erosion and sediment control system which protects disturbed areas and soil stockpiles/spoil areas. The system shall be modified by the Contractor from time to time to effectively control erosion and sediment during construction.

3.03 MAINTENANCE

A. Maintain erosion and sediment control structures and procedures in full working order at all times during construction. This shall include any necessary repair or replacement of items which have become damaged or ineffective. Remove sediment on a regular basis which accumulates in sediment control devices and place the material in approved earth spoil areas or return the material to the area from which it eroded.

B. Upon completion of construction, properly remove the temporary erosion and sediment control structures and complete the area as indicated.

C. Soil retention blankets will not require removal if installed on a finished graded area specified to receive seeding.

3.04 FIELD QUALITY CONTROL

In the event of conflict between the requirements and storm water pollution control laws, rules or regulations or other Federal, State or Local agencies, the more restrictive laws, rules or regulations shall apply.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

The work as provided for by this specification shall be measured as lump sum or as noted on the bid request. When not line item is included in the Bid Proposal, this work shall be considered incidental to the completion of the project and no additional compensation shall be paid for this work.

4.02 PAYMENT

When shown in the proposal, the work as prescribed for in this specification shall be paid for labor, tools, equipment, excavation, backfilling, materials, and incidentals necessary to complete the work.

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK AND RELATED DOCUMENTS

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation and services required and incidental thereto, as shown on drawings and/or specified herein including but not limited to; the furnish and installation of specified products.

B. Related Work Specified Elsewhere:

1. Submittal Requirements: Section 01300
2. Project Closeout Procedures: Section 01700

C. Whenever possible the minimum acceptable quality of workmanship and materials has been defined by the manufacturer's name and catalogue number, reference to industry or governmental standards, or description of required attributes and performance.

1.2 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term “product” includes the terms “material,” “equipment,” “system,” and terms of similar intent.

1. Named Products: Items identified by manufacturer’s product name, including make or model number or other designation shown or listed in manufacturer’s published product literature that is current as of date of the Contract Documents.

1.3 SUBMITTAL LIST

A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer’s name and proprietary product names for each product.

1. Coordinate product list with Contractor’s Construction Schedule and the Submittals Schedule.

2. Form: Tabulate information for each product under the following column headings.

a. Generic name used in the Contract Documents.
b. Proprietary name, model number, and similar designations.
c. Manufacturer’s name and address.
d. Supplier’s name and address.
e. Installer’s name and address.

f. Projected delivery date or time span of delivery period.
g. Identification of items that require early submittal approval for scheduled delivery date.

3. Owner's Action: Owner will respond in writing to Contractor within ten working days of receipt of completed product list. Owner's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Owner's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with intact and legible labels and instructions for handling, storing, unpacking, protecting, and installing.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.

1.5 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

PART 2 – PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

END OF SECTION

SECTION 01700

PROJECT CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK AND RELATED DOCUMENTS

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation and services required and incidental thereto, as shown on drawings and/or specified herein including but not limited to; the submittal of closeout documents, final cleaning of materials and equipment and furnishing permit clearances, guarantees and warranties.

B. Related Work Specified Elsewhere:

1. Submittal Requirements: Section 01300

C. The completion of the closeout procedures indicated in these specifications will be a condition for releasing final payment.

1.2 PROJECT CLEAN-UP

A. Provide all required personnel, equipment and materials needed to maintain the specified standard of cleanliness. Use only materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material, or as approved by the Engineer/Architect.

B. Final cleaning shall mean a level of cleanliness generally provided by skilled cleaners using commercial quality, site maintenance equipment and materials.

C. The Contractor shall schedule a final cleaning as approved by the Engineer/Architect.

1.3 OPERATION AND MAINTENANCE MANUAL

A. The Contractor shall obtain from the various Subcontractors various operation and maintenance data, replacement parts lists, maintenance schedule requirements, etc., and bind the information into a reference manual. Two sets shall be turned over to the Engineer/Architect prior to request for final payment.

B. Operation and maintenance manuals shall be neatly bound with each trade so indexed. In some cases, approved shop drawings and submittals may suffice for use in this regard. Equipment parts lists for replacement purposes shall be included wherever possible.

1.4 ONSITE TRAINING

A. The Contractor shall provide a demonstration of the operation techniques and methods of the mechanical, electrical and plumbing systems. This demonstration must be coordinated with the Engineer/Architect. The operation and maintenance manuals must be available for use during this training period.

B. The Contractor shall propose a time in writing to the Engineer/Architect allowing at least seventy-two (72) hours notice.

1.5 AS BUILT DRAWINGS

A. Final "As-Built" drawings shall be prepared by the Contractor in an Auto CAD 2005 or better format. These drawings shall indicate all changes or deviations from the construction documents. These drawings shall be submitted to the Engineer/Architect on a CD. The drawings must clearly state AS BUILT and be neatly organized.

1.6 GUARANTEES AND WARRANTIES

A. The Contractor shall provide a letter of guarantee, see General Conditions Sec. 40

B. The Contractor shall provide final clearances from all permitting agencies.

1.7 FINAL COMPLETION

A. The Contractor shall supply a written request for a Final Completion inspection. This request shall include the following:

1. Certification that the work and actions specified in the Contract Documents has been completed and that the Owner has full use of the site.
2. All equipment has been tested and balanced and is fully functional.
3. The Onsite Training Program has been completed and there are no outstanding issues resulting from said program.
4. A copy of the list of deficiencies generated by the Substantial Completion Inspection, with each item initialed and showing date completed.
5. A list of all Subcontractors and material suppliers with name, address and phone number. Include source for parts replacement and local representative if different.
6. Submit all test/adjust/balance records and start-up performance reports.
7. Submit all tools, keys and any special devices to assure complete operation by the Owner.
8. Final application for payment.
9. Waivers, Sworn Statements and Affidavits of Payments to Subcontractors and Suppliers.

END OF SECTION

SECTION 02101

PREPARATION OF RIGHT-OF-WAY

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. Removal and disposal of all obstructions from the right-of-way and from designated easements for construction operations, by removing and disposing of all obstructions when removal of such obstructions is not specifically shown on the plans to be paid by other items.

B. Obstructions shall include, but are not limited to:

1. Remains of houses not completely removed by others.

2. Concrete, foundations, floor slabs, curb and gutter, driveways, and sidewalk.

3. Building materials such as brick, lumber and plaster.

4. Water wells, septic tanks, manholes, inlets utility pipes and conduits.

5. Underground service station tanks, equipment or other foundations.

6. Fencing and retaining walls.

7. Paved parking areas.

8. Abandoned railroad tracks, ties, and scrap iron.

9. Ancillary structures such as shacks and outhouses.

10. Trees, stumps, bushes, shrubs, roots, limbs and logs.

11. All rubbish and debris whether above or below ground.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide materials required to perform work as specified.

PART 3 - EXECUTION

3.01 **GENERAL**

A. Clear entire project right-of-way and such other areas, including public or corporate lands, specified in the plans of all structures and obstructions.

B. Trim carefully all trees and shrubs designated for preservation and protect from scarring or other injuries during construction operation.

C. Removal of all foundations and underground obstructions, unless otherwise specified, shall be removed to the following depths:

1. In embankment areas, two (2) feet below natural grounds.

2. In excavation areas, two (2) feet below the lower elevation of excavation.

3. In all other areas, one (1) foot below natural grade.

D. Backfill all holes, as directed by the ENGINEER, resulting from all removals.

E. Complete the preparation of right-of-way such that prepared right-of-way is free of holes, ditches and other abrupt changes in elevations and irregularities to contours.

F. Plug the remaining ends of all abandoned storm sewers, culverts, sanitary sewers, conduits and utility pipes with concrete, as specified by the ENGINEER, to form a tight closure.

G. On existing concrete where only a portion is to be removed, care shall be exercised to avoid damage to remaining concrete. Where concrete reinforcement is encountered in removed portions, a minimum of one (1) foot of such reinforcement shall be cleaned of old concrete and left in place to tie into new construction. Concrete to be preserved, but subsequently destroyed by the CONTRACTOR'S operations, shall be replaced by the CONTRACTOR at his expense in accordance with City Specifications, or as directed by the ENGINEER.

PART 4 - MEASUREMENT AND PAYMENT

4.01 PREPARATION OF RIGHT-OF-WAY

A. Preparation of right-of-way shall be measured by one of the following methods: on a lump-sum basis; by the acre; or by the linear foot along the centerline of construction (regardless of the width of the right of way). The measurement for payment made only on areas indicated and classified on the plans as preparation of right-of-way.

B. When not listed as a separate contract pay item, preparation of right-of-way shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.

C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

END OF SECTION

SECTION 02102

CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK

A. Cleaning and grubbing shall consist of the removal of trees, stumps, brush, roots, vegetation, logs, rubbish, and other objectionable matter within the project site limits described in the specifications or as shown on plans.

B. Cleaning and grubbing shall be done in advance of grading operation. Grubbing may be done simultaneously with excavation, if the cuts are over 3 feet in depth and objectionable matter is removed as specified.

C. Clearing and Grubbing shall consist of the disposal of all debris resulting from the work specified herein.

1.02 PROTECTION OF ADJACENT WORK:

A. Provide protection necessary to prevent injury or damage to existing improvements, adjacent property, utilities and other facilities, and trees and plants, indicated to remain in place.

B. Protect improvements on adjoining properties and all areas outside indicated construction areas from injury or damage.

C. Restore damaged improvements to their original condition, as acceptable to the Engineer and property owners.

D. Conduct site clearing and grubbing operations to ensure minimum interference with road, streets, alleys, walks, and other adjacent, occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Provide all required personnel, equipment, and materials required to perform the work as specified.

PART 3 - EXECUTION

3.01 CLEARING:

A. Clear all areas covered by dikes, roads, structures and embankments within project limits unless otherwise shown in plans.

B. Remove all saplings, brush, down-timber and debris unless shown or directed otherwise.

C. Use tree wound paint to treat scars, gashes or limbs stubs on trees not removed.

3.02 GRUBBING:

A. Trees, stumps, root systems, rocks and other obstructions shall be removed to the depths shown when they fall within the construction templates for the following items:

1.	Footings	18-inches below bottom of footing.
2.	Sidewalks (or other types of walks)	12-inches below bottom of walk.
3.	Roadways or Streets	24-inches below bottom of base material.
4.	Parking Areas	24-inches below bottom of base material.
5.	Grassed Areas	18-inches below top soil.
6.	Fills	24-inches below bottom of fill.

B. Blasting not permitted.

3.03 REMOVAL OF DEBRIS AND CLEANUP

A. Burn as permitted by regulating agencies or the Engineer as work progresses.

B. Unguarded fires will not be permitted.

C. Permits will be obtained, where required, for necessary burning or disposal sites.

D. Dispose of all waste materials not burned by removal from site.

E. Materials cleared and grubbed shall be the property of the Contractor and shall be his responsibility for disposal.

PART 4 - MEASUREMENT AND PAYMENT

4.01 CLEARING AND GRUBBING:

A. Clearing and Grubbing shall be measured for payment either in acres or by lump sum only for areas indicated on the plans, or as provided in the proposal and contract.

B. When not listed as separate contract pay item, Clearing and Grubbing shall be considered as incidental work, and the cost thereof shall be included in such contract pay items as are provided in the proposal contract.

C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor equipment, tools and in incidentals required for the work, all in accordance with the plans and these specifications.

END OF SECTION

SECTION 02210

GRADING AND EARTHWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Grading and earthwork which occurs in areas other than under structures, under paving, or trenching for utilities.

B. Earthwork consists of operations required for the excavation of materials on site; excavation of borrow material from designated areas; compaction of natural or improved sub-grades: finish grading; disposal of excess or unsuitable materials; and other required operations. Earthwork shall conform with dimensions and typical sections shown, and within lines and grades established on Drawings.

1.2 RELATED SECTIONS:

A. Trenching, structure excavation, backfilling and grading - Section 02221.

B. Excavating, backfilling and compacting for utilities - Section 02225.

1.3 REFERENCES:

A. ASTM D698 - Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 lbf/ft^3).

B. ASTM D4972 - pH of Soil.

C. ASTM G57 - Field Measurement of Soil Resistivity Using the Wenner Four Electrode Method.

D. ASTM D4318 - Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.4 EXISTING UTILITIES:

A. Where pipes, ducts and structures are encountered in the excavation but are not shown on the Drawings, immediately notify the LANDSCAPE ARCHITECT.

1.5 DEFINITIONS:

A. Classification: Earthwork materials are classified in accordance with definitions in this Article.

B. Topsoil: Top 6 inches of natural surface soil possessing the characteristics of representative soils on the site that produce growths of grass or other vegetation. Topsoil includes roots and other vegetation.

C. General Site Fill: Suitable, clean material excavated on-site or off-site may be used as fill material. Suitable material shall consist of clay soils classified as CH according to the unified soil classification system. Clay soil used as fill shall have a liquid limit of less than 55 and a Plasticity Index comparable with on-site soils.

D. Select Fill: Select fill material, as required for construction, defined in the plans and/or Sections 02221 and 02225, shall consist of inorganic silty or sandy clay.

E. Subgrade: Consists of that portion of the surface on which a compacted fill, backfill or topsoil is placed.

F. Borrow: Material taken from on-site designated areas or approved off-site sources to make up any deficit of excavated material. Obtain from area that is normally dry and well drained. Borrow does not include top soil.

G. Finish Grading: Operations required for smoothing disturbed areas that are not overlaid with pavement.

H. Excavation: Excavation of every description and of whatever substances encountered within the limits of the project to the lines and grades indicated on the Drawings.

I. Compaction: Compaction of soil materials shall be measured as a percent of Standard Proctor density as determined by the ASTM D698.

PART 2 - PRODUCTS

2.1 SELECT FILL:

A. Source: Obtain select fill material from required excavation, or if excavated material is not adequate, from borrow areas approved by the LANDSCAPE ARCHITECT. Material from source shall be tested for compliance with project requirements and approved by the Owner and Testing Laboratory.

B. Suitability: Use the best material available from excavation or borrow, suitability of select fill is subject to the ENGINEER'S approval.

C. Quality: Select fill material must be free of rock and clay lumps or excessive silts. Do not use soil containing brush, roots, sod or similar organic materials.

D. Characteristics: Select fill material shall consist of inorganic silty or sandy clay. Additional select fill requirements are described in Sections 02225.

2.2 FILL AND BACKFILL UNDER TOPSOIL:

A. Source: Obtain site fill from required excavation or, if excavated material is not sufficient, from borrow areas approved by the ENGINEER.

B. Suitability: Use the best material available from excavation or borrow. Suitability of fill material is subject to the Testing Laboratory\Engineer's approval.

C. Quality: Fill material shall be free of excessive silts. Do not use soil containing brush, roots, sod or similar organic materials.

D. Characteristics: Fill material shall have a plasticity index between 6 and 25, inclusive, and shall generally be of similar character to that of existing soil at the site.

PART 3 – EXECUTION

3.1 STRIP AND STOCKPILE:

A. Remove topsoil at all non-paved areas where excavation of topsoil is required or where fill material will be added for site grading. Remove top 6 inches of topsoil where necessary and stockpile on the property as directed by the Owner. Protect stockpiled topsoil from other excavated materials, dumping of unwanted material, dumping by the public, and erosion. Upon completion of rough grading, replace topsoil in 4-inch minimum layer to finish grade elevations as shown on the grading plan.

B. Removal of topsoil in building areas and paving areas is further described under provisions of Section 02225.

3.2 EXCAVATION:

A. Objective: As shown on the Drawings, excavate to lines, grades and elevations required for subsequent construction. All excavation shall be made in such manner as to permit all surfaces to be brought to final line and grade within plus or minus 0.1 foot. Over excavation shall be restored by the Contractor at his own expense. Finished grades consistently high or low will not be acceptable and shall be corrected by the Contractor at his expense and no additional cost to the Owner.

B. Drainage: During excavation, maintain grades as required to provide positive drainage away from structures; or, as directed by the LANDSCAPE ARCHITECT, install temporary drains or drainage ditches to intercept or divert surface water and prevent interference or delay of the work.

C. Stockpiling: If, at time of excavation, it is not possible to place material in the proper section of permanent construction, CONTRACTOR shall stockpile the material in Owner or Architect approved areas for later use.

D. Stone or Rock: Stone or rock fragments greater than 6" will not be allowed in fills or embankments. Stones or rock fragments larger than 2 inches in their greatest dimension will not be permitted in top 6 inches of subgrade.

E. Dressing: Uniformly dress, cut and fill slopes to slope, cross section and alignment, as shown.

3.3 TREATMENT OF SUBGRADES:

A. All topsoil and vegetation shall be stripped from the ground surface and stockpiled, exposing sound undisturbed subgrade soils.

B. After stripping the topsoil in areas to receive fill or cut areas, the exposed ground surface shall be scarified to a depth of 6 inches, the moisture adjusted, and then re-compact to a minimum density of 95 percent of the maximum density as obtained in the Standard Proctor Compaction Test (ASTM D698), at a moisture content between minus 1 to plus 3 percent of optimum. Any soft or compressible areas detected during the re-compaction process shall be undercut such that sound subgrade soils are exposed and re-compacted. Site excavated or select fill shall then be used to bring all areas to grade. Allow for placement of minimum 4-inch layer of top soil in areas not covered by building or pavement.

C. Finished subgrade shall be inspected by Testing Laboratory for determination that subgrade meets requirements of Contract Documents.

3.4 PLACING FILL AND BACKFILL:

A. Examination of Subgrade: Do not place fill on any part of the subgrade until the subgrade preparation has been accepted by the Engineer.

B. Removing Debris: During the dumping and spreading process, remove all roots, stones and debris that are uncovered in the fill material.

C. Spreading Fill and Backfill: After dumping, spread the material in horizontal layers over the entire fill area. The thickness of each layer before compaction shall not exceed 8 inches unless otherwise directed by the Engineer. Maintain positive drainage throughout construction. The combined excavation and fill placing operation shall be such that the material when compacted in the fill will be blended sufficiently to secure the best practicable degree of compaction. The suitability of the materials shall be subject to testing by the Testing Laboratory and approval of the Engineer. After each layer of fill has been spread to the proper depth, it shall be thoroughly manipulated with a disc plow or other suitable and approved equipment until the material is uniformly mixed, pulverized and brought to uniform approved moisture content.

D. Attaining Proper Bond: If, in the opinion of the Testing Laboratory, the compacted surface of a layer is too smooth to bond with succeeding layers, loosen the surface by harrowing or other approved method before continuing the work.

E. Place materials to proper elevation allowing for depth of topsoil furnished under this Contract.

3.5 MOISTURE CONTROL:

A. Intent: Developing the maximum density obtainable with the natural moisture of the material is preferred. However, the moisture content shall not vary from the optimum, as determined by ASTM D698, by more than minus 1 to plus 3 percent of optimum.

B. Adjustment: If the moisture content is too high, adjust to within the specified limits by spreading the material and permitting it to dry. Assist the drying process by discing or harrowing if necessary. When the material is too dry, sprinkle each layer with water. Work the moisture into the soil by harrowing or other Engineer approved method.

3.6 COMPACTION:

A. Rough Grade: Compact each layer of fill material with suitable equipment as necessary to secure 95% to 98% Standard Proctor Density (ASTM D698) within the specified range of the moisture content.

B. Finish Grade: Place and lightly compact topsoil to achieve finish grades.

3.7 DISTRIBUTION OF TOPSOIL:

A. Perform rough grading and topsoil/finish grading work.

B. Preparation:

1. Prior to placing topsoil, scarify the subgrade to a depth of 2 inches to provide effective bonding of the topsoil with the subgrade.
2. Shape all areas designated for grading, including cut and fill areas, to receive a minimum of 4 inches of topsoil

C. Placement:

1. Do not haul or place wet topsoil. Also prohibited is placement of topsoil on a subgrade that is excessively wet, extremely dry, or in a condition otherwise detrimental to proper grading or proposed planting.

2. Distribute topsoil uniformly and spread evenly. Correct irregularities in the surface to prevent formation of depressions where water could stand.

3. Perform the spreading operation so that planting can proceed with little additional tillage or soil preparation. Leave the area smooth and suitable for lawn planting.

4. Lightly compact topsoil to obtain proper bond with previously placed or prepared material.

D. Maintenance: Where any portion of the surface becomes eroded or otherwise damaged, repair the affected area to establish the condition and grade prior to topsoil placement; then replace topsoil.

3.8 MATERIAL DISPOSAL:

A. Excess Excavation Material (soil material free of trees, stumps, logs, brush, roots, rubbish and other objectionable matter which has been accepted by the Geotechnical Engineer): Remove excess excavated material from the construction site or place on the property as directed by the ENGINEER.

B. Waste Material (soil material including trees, stumps, logs, brush, roots, rubbish and other objectionable matter which has not been accepted by the Geotechnical Engineer): Remove waste material from the project site before Final Inspection. Legally dispose of material at a licensed site or with written and notarized permission from the property owner for a private disposal site. All costs associated with waste material removal and disposal shall be paid for by the Contractor.

PART 4 - TESTING

A. The testing laboratory will make tests of in-place density in accordance with ASTM Standards. Backfill operations will be monitored continuously by the testing laboratory at structures. It will be the responsibility of the CONTRACTOR to notify the testing laboratory before backfill operations begin.

PART 5 - MEASUREMENT AND PAYMENT

A. No separate payment shall be made to the CONTRACTOR for the work described in this Section. Such work shall be considered incidental to the project and the payments made under specific Pay Items shall be considered as full compensation for these requirements.

END OF SECTION

SECTION 02220

SUBGRADE PREPARATION

PART 1 – GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. This work shall consist of scarifying, blading and rolling the sub-grade to obtain a uniform texture and provide as nearly as practical a uniform density for the 6 inches of the sub-grade.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS:

A. All preparing of the right-of-way and/or clearing and grubbing shall be completed before starting the sub-grade preparation.

B. The sub-grade shall be scarified and shaped in conformity with the typical sections and the lines and grades indicated or as established by the ENGINEER by the removal of existing material or addition of approved material.

C. All unsuitable material shall be removed and replaced with approved material.

D. All foundations, walls or other objectionable material shall be removed to a minimum depth of 18-inches under all structures and 12-inches under areas to be vegetated. All holes, ruts and depressions shall be filled with approved material.

E. The surface of the sub-grade shall be finished to the lines and grades as established and be in conformity with the typical sections indicated.

F. Any deviation in excess of ½ inch cross section and in a length of 10 feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping and compacting by sprinkling and rolling.

G. Sufficient sub-grade shall be prepared in advance to insure satisfactory prosecution of the work.

H. The CONTRACTOR will be required to set blue tops for the sub-grade on centerline, at quarter points and curb lines or edge of pavement at intervals not exceeding 50 feet.

I. All suitable material removed may be utilized in the sub-grade with the approval of the ENGINEER. All other material required for completion of the sub-grade shall also be subject to approval by the ENGINEER.

J. Sub-grade materials on which structures shall be placed shall be compacted by approved mechanical tamping equipment to a dry density of the total material of not less than 95 percent

nor more than 100 percent of the maximum dry density as determined in accordance with SDHPT Test Method Tex-114-E.

K. Sub-grade materials on which planting or turf will be established shall be compacted to a minimum of 85 percent of the maximum dry density as determined in accordance with SDHPT Test Method Tex-114-E.

L. Tests for density will be made as soon as possible after compacting operations are completed. If the material fails to meet the density specified, it shall be reworked as necessary to obtain the density required.

M. Just prior to placing any base materials, density and moisture content of the top 6 inches of compacted sub-grade shall be checked and if tests show the density to be more than 2 percent below the specified minimum or the moisture content to be more than 3 percent above or below the optimum, the sub-grade shall be reworked as necessary to obtain the specified compaction and moisture content.

N. When lime stabilization of the sub-grade is specified, the lime is to be added in accordance with Section 02240, Lime Stabilization.

O. Proof Rolling is require before placing base material in conformity with Item 02686 "Proof Rolling"

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. All acceptable sub-grade preparation will be measured by the square yard.

B. The measured area includes the entire width of the roadway for the entire length as indicated.

4.02 PAYMENT:

A. The accepted quantities of sub-grade preparation will be paid for at contract unit bid price per square yard.

B. When not listed as a separate contract pay item, sub-grade preparation shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.

C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

END OF SECTION

SECTION 02225

EXCAVATION, BACKFILL AND COMPACTION FOR PAVEMENT

PART 1 – GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. Prior to commencement of this work, all required erosion control and tree protection shall be in place.

B. Perform all required excavation, backfill and compaction within the limits of right of way and adjacent thereto (except excavations specifically described and provided for elsewhere in the specifications).

C. Remove, properly use, or dispose of all excavated materials.

D. Shape and finish all earth work in conformance with lines and grades as shown on the plans or as specified by the Engineer.

E. Schedule work to avoid property owner inconvenience as practical during construction.

F. Exercise care in operating applicable equipment beneath or adjacent to trees, sidewalks, poles, and other existing features to prevent damage.

G. Restore obstructions removed to accommodate construction equipment or to facilitate excavation.

1.02 CLASSIFICATION:

A. All street excavation shall be unclassified, regardless of material encountered.

B. Any reference to rock or any other material on the plans, or in these specifications, is not to be construed as classification of the excavation.

1.03 REFERENCES

A. ASTM D698 - Moisture-Density Relations of Soils (Standard).

B. ASTM D4318 - Test for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.04 EXISTING UTILITIES

A. Where pipes, ducts and structures are encountered in the excavation but are not shown on the Drawings, immediately notify the Landscape Architect.

1.05 DEFINITIONS

A. Classification: Earthwork materials are classified in accordance with definitions in this Article.

B. Topsoil: Top 6 inches of natural surface soil possessing the characteristics of representative soils on the site that produce growths of grass or other vegetation. Topsoil includes roots and other vegetation.

C. Pavement Select Fill: Select fill material excavated on site or suitable borrow material consisting of inorganic sandy clay meeting specified requirements.

D. Natural Subgrade: Consists of that portion of the surface on which a compacted embankment or pavement is constructed, after removal of 6-inch topsoil layer, as described in Section 02210.

E. Compacted Embankment: A subgrade under pavement consisting of fill placed and compacted between the top of compacted natural subgrade and underside of pavement and including fill areas adjacent to paving within limits shown on Typical Cross Sections.

F. Finish Grading: Operations required for smoothing disturbed areas that are not overlaid with pavement.

G. Excavation: Excavation of every description and of whatever substances encountered within the grading limits of the project to the lines and grades indicated on the Drawings.

H. Compaction: Compaction of subgrade soil materials, shall be measured as a percent of Standard Proctor Density at the specified moisture content as determined by ASTM D698

PART 2 - PRODUCTS

2.01 MATERIALS

A. Fill under Pavement

1. Inorganic sandy clay.

2. Optimal plasticity index between 7 and 20.

3. Optimal liquid limit of 35 or less.

4. No rock or pieces larger than 3 inches greatest dimension.

B. All fill soils shall be free of organic material and debris. A quality control program shall be established by the Contractor to check that zones of unsuitable soils are not allowed in the paving areas.

PART 3 - EXECUTION

3.01 HANDLING OF TOPSOIL

A. Remove top 6 inches of topsoil within limits of the paving section, and area adjacent to paving section as required, and stockpile on the Owners property in an approved location.

3.02 STRIPPING OF GROUND SURFACE

A. All vegetation, all decayed vegetable matter, rubbish and other unsuitable material within the areas to be graded, not removed by clearing, shall be stripped or otherwise removed to 18 inches below ground level before grading or other earthwork is started. In no case will such material be allowed to remain in or on the areas to be graded.

3.03 EXCAVATION

A. Objective: As shown on the Drawings, excavate to lines, grades and elevations required for subsequent construction of embankments, flexible base, or pavement. Remove materials within the indicated limits and dispose as directed.

B. Drainage: During excavation, maintain grades for complete drainage. When directed, install temporary drains or drainage ditches to intercept or divert surface water and prevent interference or delay of the work.

C. Stockpiling: If, at time of excavation, it is not possible to place material in the proper section of permanent construction, stockpile the material in approved areas for later use.

D. Stone or Rock: Stones or rock fragments larger than 1-inches in their greatest dimension will not be permitted in top 6 inches of subgrade.

E. Dressing: Uniformly dress, cut and fill slopes to slope, cross section and alignment, as shown.

3.04 NATURAL SUBGRADE UNDER PAVEMENTS

A. Remove existing earth as required for placement of pavement section as indicated on the Drawings. Proof roll excavated surface with a 20 ton or larger roller to identify soft or undesirable material and remove such soft or undesirable material to suitable material beneath at least 2 feet below grade. Break down sides of holes or depressions to flatten the slopes.

B. Fill any such hole or depression with appropriate soil with similar classification, moisture content, and density as adjacent soils.

C. Grade adjustments within pavement construction limits shall be accomplished with pavement select fill, placed in maximum 8-inch lifts moistened and compacted as specified in this Section.

D. After depressions have been filled, grade adjustments made, and immediately before placement of pavement section, thoroughly loosen the foundation material to a depth of 8 inches. Remove roots and debris turned up while loosening the soil. Adjust moisture and recompact the subgrade as specified in this Section.

3.05 PLACING EMBANKMENT FILL FOR GRADE ADJUSTMENTS

A. Inspection of Natural Subgrade: Proof roll excavated surface with a 20 ton or larger roller to identify soft or undesirable material and remove such soft or undesirable material to suitable material beneath. Any soft or compressible areas detected during the recompaction process shall be undercut such that sound subgrade soils are exposed and recompacted. Do not place select fill for grade adjustments to the natural subgrade until the surface has been approved.

B. Prior to placing pavement fill, scarify the natural subgrade to a depth of 6 inches. As needed, adjust the moisture content to between optimum and plus 4 percent. Recompact to the subgrade to a dry density between 95% of the maximum Standard Proctor Density, as determined by ASTM D698.

C. Removing Debris: During the dumping and spreading process, remove all roots, stones, and debris that are uncovered in the select material.

D. Spreading Fill: After dumping, spread the pavement select fill in horizontal layers over the entire fill area. The thickness of each layer before compaction shall not exceed 8-inches and compact to the moisture/density values specified above. Place fill adjacent to pavement sections to elevations indicated.

E. Attaining Proper Bond: If the compacted surface of a layer is too smooth to bond with succeeding layers, loosen the surface by harrowing or other approved method before continuing the work.

3.06 MOISTURE CONTROL

A. Intent: Developing the maximum density obtainable with the natural moisture of the material is preferred. However, the moisture content of the pavement base material shall not vary from -2 percent optimum, as determined by ASTM D698, to more than plus 3 percent of optimum. The moisture content of the natural subgrade under pavement sections, including grade adjustments with pavement select fill, as determined by ASTM D698 shall be maintained between optimum and plus 4 percent of optimum.

B. Adjustment: If the moisture content is too high, adjust to within the specified limits by spreading the material and permitting it to dry. Assist the drying process by disking or harrowing if necessary. When the material is too dry, sprinkle each layer with water. Work the moisture into the soil by harrowing or other approved method.

3.07 COMPACTION

A. Compact each layer of pavement select fill with suitable rollers as necessary to obtain a dry density of 95% maximum dry density within the specified range of the moisture content, according to ASTM D698.

3.08 MATERIAL DISPOSAL

A. Excess Excavated Material (soil material free of trees, stumps, logs, brush, roots, rubbish and other objectionable matter which has been approved) shall be removed from the construction site before Final Inspection. Approved excess material shall be deposited on the Owner's property in an approved location.

B. Waste Material (soil material including trees, stumps, logs, brush, roots, rubbish and other objectionable matter which has not been approved) shall be removed from the project site before Final Inspection. Legally dispose of material at a licensed site or with written and notarized permission from the property owner for a private disposal site. All costs associated with waste material removal and disposal shall be paid for by the Contractor.

3.09 TESTING AND CONTROL

The testing laboratory will make tests of in-place density in accordance with ASTM Standards (Specification Section 01460). Backfill operations will be monitored continuously by the testing laboratory.

3.10 MEASUREMENT AND PAYMENT

No separate payment shall be made to the CONTRACTOR for the work described in this Section. Such work shall be considered incidental to the project and the payments made under specific Pay Items shall be considered as full compensation for these requirements.

END OF SECTION

SECTION 02226

LOADING & HAULING

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. Perform all required work within the limits of right-of-way and adjacent thereto for loading, hauling, shaping and/or stockpiling of fill material (except excavations specifically described and provided for elsewhere in the specifications).

B. Loading and hauling of all excavated materials.

C. Shape and finish all earthwork in conformance with lines and grades as shown on the plans or as specified by the ENGINEER/LANDSCAPE ARCHITECT.

D. Stockpile all earthwork in conformance with lines and grades as shown on the plans or as specified by the ENGINEER/LANDSCAPE ARCHITECT.

E. Schedule work to avoid property owner inconvenience as practical during construction.

F. Exercise care in operating applicable equipment beneath or adjacent to trees, sidewalks, poles, and other existing features to prevent damage.

G. Restore obstructions removed to accommodate equipment or to facilitate loading, hauling, shaping or stockpiling all earthwork.

1.02 CLASSIFICATION:

A. All material loaded and hauled shall be unclassified, regardless of material encountered.

B. Any reference to rock or any other material on the plans, or in these specifications, is not to be construed as classification of the excavation.

PART 2 - PRODUCTS

2.01 LOADING

A. Loading shall be by rubber wheel, track loader or any other method approved by the ENGINEER/LANDSCAPE ARCHITECT.

B. The loader bucket shall be a standard unit volume to allow for estimation of hauled material.

C. The dump truck(s) shall be standard unit volume to allow for estimation of hauled material.

2.02 HAULING

A. All material shall be delivered to areas specified on plans or as noted on the bid proposal.

B. All hauling equipment shall abide by all applicable local, state and federal rules, regulations and statues. Every effort shall be made to stay on approved truck routes during hauling operations.

2.03 SHAPING

A. All material shall be shaped to conform to grades and lines shown on the plans or as directed by the ENGINEER/LANDSCAPE ARCHITECT.

2.04 STOCKPILING

A. All material shall be stockpiled to conform to grades and lines shown on the plans or as directed by the ENGINEER/LANDSCAPE ARCHITECT.

PART 3 - EXECUTION

3.01 UNCLASSIFIED FILL MATERIAL LOADING, HAULING, SHAPING & STOCKPILING:

A. Perform all loading of unclassified fill material as shown on the plans or noted on the bid proposal.

B. Haul unclassified fill material to areas requiring fill and place in accordance with these specifications. Determination of suitable material will be made by ENGINEER/LANDSCAPE ARCHITECT. Haul unsuitable material to waste sites.

C. Shape, slope and fill sections uniformly as noted on plans or other controlling feature, or as designated by ENGINEER/LANDSCAPE ARCHITECT. Smooth bank to provide a neat finished appearance.

D. Strip, salvage and stockpile topsoil in sufficient quantity to allow a uniform 6-inch lift over all disturbed areas not otherwise surfaced. Topsoil is included in unclassified excavation.

E. Stockpile unclassified fill material as noted on plans or bid proposal, in accordance with these specifications. Determination of stockpile height will be made by the ENGINEER/LANDSCAPE ARCHITECT.

3.03 EXCESS OR UNSUITABLE EXCAVATION:

A. Dispose of excavation in excess of that needed or unsuitable for construction. As directed by the ENGINEER/LANDSCAPE ARCHITECT, excess or unsuitable excavation may be used for widening of embankments, or flattening of slopes, or as otherwise specified.

B. Obtain approval of the ENGINEER/LANDSCAPE ARCHITECT as to disposition and method for disposal of excess or unsuitable excavation.

3.04 GENERAL:

A. Provide all labor, equipment and associated materials to load, haul, shape and/or stockpile unclassified fill material.

PART 4 - MEASUREMENT AND PAYMENT

4.01 LOADING, HAULING & SHAPING OF UNCLASSIFIED FILL MATERIAL:

A. Unclassified fill material, as authorized, shall be measured in its loose position. The volume shall be determined by the average end area method and multiplied by a factor of 1.33 for estimation of hauling quantities. All work performed shall be paid for at the contract unit bid price per cubic yard for loading, hauling, shaping and/or stockpiling of unclassified fill material.

B. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required by the work, all in accordance with the plans and these specifications.

C. Adjustment of any facilities to accommodate loading, hauling, shaping or stockpiling of fill material shall be considered incidental to the bid.

END OF SECTION

SECTION 02227

EXCAVATION, BACKFILL AND COMPACTION FOR UTILITIES

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Excavating, trenching, backfilling and compacting for water distribution mains, sanitary sewers, manholes, drainage and other utility systems and appurtenances, and the disposal of excess excavated material.

1.2 RELATED SECTIONS:

A. Grading and earthwork - Section 02210.

B. Excavating, Backfilling and Compacting for Pavement - Section 02226.

1.3 REFERENCES:

A. ASTM C33 - Concrete Aggregates.

B. ASTM D4318 - Liquid Limit, Plastic Limit and Plasticity Index of Soils.

C. ASTM D698 - Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 lbf/ft^3).

1.4 PROTECTION OR REMOVAL OF UTILITY LINES:

A. The Contractor shall anticipate all underground obstructions such as, but not limited to, water mains, gas lines, storm and sanitary sewers, telephone or electric light or power ducts, concrete, and debris. Any such lines or obstructions indicated on the Drawings show only the approximate locations and shall be verified in the field by the Contractor. The Engineer will endeavor to familiarize the Contractor with all known utilities and obstructions, but this shall not relieve the Contractor from full responsibility in anticipating all underground obstructions whether or not shown on the Drawings.

B. The Contractor shall, at his own expense, maintain in proper working order and without interruption of service all existing utilities and services which may be encountered in the work, except that with the consent of the Utility Owner such service connections may be temporarily interrupted to permit the Contractor to remove designated lines or to make temporary changes in the locations thereof as will aid in the completion of the work and at the same time maintain service to the property so originally benefited. The cost of making any temporary changes shall be at the Contractor's expense.

C. Before starting construction, the Contractor shall notify all utility companies involved to have their utilities located and marked in the field. All underground utilities shall then be uncovered to verify location and elevation before construction begins. The Contractor shall obtain all necessary permits.

PART 2 - PRODUCTS

2.1 EARTH BACKFILL:

A. Earth Backfill shall be free of lumps, stones, trash and spongy or otherwise objectionable material, and shall be approved by the Engineer. Approved backfill material may be from the excavation or borrowed.

2.2 SAND:

A. Use sand that is free from clay lumps, organic and other deleterious material, and having a plasticity index of not less than 4 or greater than 12, as determined by ASTM D424.

2.3 CRUSHED ROCK:

A. Provide durable crushed rock free of clay lumps, organic or other deleterious material. Crushed rock size shall be No. 57 or No. 67 in accordance with ASTM C33 Grading Requirements for Coarse Aggregates.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION:

A. Examine utility routes and coordinate excavation work to eliminate installation conflicts.

B. Allow room for stockpiling excavated material and utility construction material during utility construction.

3.2 TRENCH EXCAVATION:

A. Procedure: Excavate to indicated or specified depths.
   1. Excavate by open cut.

   2. Do not use excavated material composed of rocks, chunks or clods larger than 6-inches for backfill. Dispose of such material and provide other suitable material for backfill without additional expense.

      3. During excavation, stock pile material suitable for backfilling in an orderly manner far enough from the bank of the trench to avoid overloading, slides or cave-ins.

   4. Grade as necessary to prevent surface water from flowing into trenches or other excavations.

5. Cut banks of trench in pipe zone as nearly vertical as practical. Remove stones as necessary to avoid point-bearing. Over-excavate wet or unstable soil from the trench bottom to permit construction of a more stable bed for pipe. Over excavation shall be filled and tamped with cement sand or other approved material to the required grade.

6. Dig the trench the proper width as shown. If the trench width below the top of pipe is wider than specified in this Section or shown on Civil Drawings, then install additional cement-sand compacted backfill. No additional payment will be made.

7. Accurately grade the trench bottom to provide proper bedding as required for pipe installation.

8. If any excavation is carried beyond the lines and grades required or authorized, the Contractor shall, at his own expense, fill such space with concrete or other suitable material as directed by the Engineer. No additional payment will be made.

B. Pipe Zone: The pipe zone is defined as including the pipe bedding, backfill to one-half the pipe diameter (the springline) and the initial backfill to 12 inches above the top of the pipe.

C. Pipe Bedding:
Class B Bedding: Accurately grade the bottom of the trench 6 inches below the bottom of the pipe and limit clear space on either side of the pipe to 9 inches at and below the top of the pipe. Place a minimum of 6 inches of natural rock or select fill up to the flow line of the pipe or above before pipe is laid. Install pipe and place additional crushed rock around the pipe and to the springline of the pipe. Lightly compact the crushed rock by tamping with mechanical tamper. Complete bedding with compacted sand to 12-inches above the top of the pipe. Crushed rock or select fill shall conform to size and gradation specified in Article 2.3 or Sect. 2234, 2.1.A.1 above.

D. Water in Excavation: Keep work free from ground or surface water at all times. Provide pumps of adequate capacity or other approved method to remove water from the excavation in such a manner that it will not interfere with the progress of the work or the proper placing of other work. Ground or surface water will not be allowed to drain into or be pumped into an existing sanitary sewer system. If the work includes connection to an existing sanitary sewer, a temporary water-tight plug shall be installed and maintained within the pipe for the duration of the contract and bedding material interrupted in a manner approved by the Engineer to isolate new construction from the existing system.

E. Do not endanger spread footings with trench excavations. Trench excavations shall not encroach within the area below a footing defined by a 1:1 slope away from the bottom corner of any footing.

3.3 UTILITY INSTALLATION:

A. Storm Sewer Culverts: Grade trenches to the line and grade required for proper installation of the pipe. Provide Class B bedding for concrete pipe or culvert installation.

B. Excavation for Appurtenances: Excavate sufficiently for manholes, utility pull boxes, barscreen structure, and similar structures to leave at least 2 feet clear between the outer surfaces and the embankment or timber that may be used to hold and protect the banks. Any over-depth excavation below such appurtenances not directed will be considered unauthorized and will be refilled with cement-sand or concrete, as directed by the Engineer, at no additional cost to the Owner.

3.4 BACKFILLING:

A. Criteria: Do not backfill trenches to a point greater than 2 feet above top of pipe until all required pressure tests are performed and utility systems as installed conform to specified requirements of appropriate sections. Backfill trenches to ground surface with material as specified. Reopen trenches improperly backfilled to depth required for proper compaction. Refill and recompact as specified, or otherwise correct the condition in an approved manner.

B. Open Areas:

1. In the pipe zone, place backfill (bedding) evenly and carefully around, under and over pipe in lifts no thicker than 6 inches. Compact with mechanical hand tampers to 95 percent density according to ASTM D698, until there is a cover of not less than 1 foot over utility lines. Use bedding and backfill material as scheduled for on plans. Take special care not to damage pipe wrapping or coating.

2. Above the pipe zone, deposit earth backfill in 8-inch lifts. Compact each lift to 95 percent maximum dry density according to ASTM D698 at minus 1 to plus 3 percent of optimum moisture content.

3. All forms, lumber, trash and debris shall be removed from trenches, manholes and other utility structures. Backfill for manholes, utility pull boxes, solid waste wash rack, and other utility structures shall be placed symmetrically on all sides in lifts no thicker than 8 inches. Each lift shall be compacted to 95 percent dry density according to ASTM D698. Use cement-sand backfill material of optimum moisture content to depth indicated and then complete backfilling with earth backfill to grade, compacted at a moisture content from minus 1 to plus 3 percent of optimum, allowing for depth of topsoil.

C. Pavement Sections:

1. In the pipe zone, deposit cement-sand backfill material in 6-inch lifts. Compact each lift to 95 percent density according to ASTM D698.

2. Above the pipe zone, deposit scheduled backfill in 8-inch lifts. Compact each lift to 95 percent maximum dry density according to ASTM D698 at optimum moisture content.

Cement-sand backfill material shall be placed as required by the construction drawings. Cure cement-sand layer at least 3 days before placing pavement.

3. For manholes and utility pull boxes in pavement sections, backfill with cement-sand to bottom of proposed pavement. Cure cement-sand layer at least 3 days before placing pavement. Cement sand back fill material shall be deposited in 8-inch lifts, compacted to 95 percent density according to ASTM D698.

3.5 TESTS FOR DISPLACEMENT OF SANITARY SEWERS:

A. All plastic pipe shall be tested for deflection by pulling a mandrel with an outside diameter equal to 95 percent of the original inside diameter of the pipe through the pipe after backfilling is complete. Mandrel shall be pulled by hand line. Should the mandrel meet any resistance, the Contractor shall clean the line, or correct the resistance, and repeat the test. Any pipe not meeting this test shall be removed and installed, or replaced if damaged.

3.6 DISPOSAL OF EXCESS MATERIAL:

A. Excess Excavated Material (soil material free of trees, stumps, logs, brush, roots, rubbish and other objectionable matter which has been accepted by the Owner): Remove excess excavated material from the construction site before Pre-final Inspection. Approved excess material shall be deposited on the Owner's property as directed by the Owner.

B. Waste Material (soil material including trees, stumps, logs, brush, roots, rubbish and other objectionable matter which has not been accepted by the Owner): Remove waste material from the project site before Pre-final Inspection. Legally dispose of material at a licensed site or with written and notarized permission from the property owner for a private disposal site. All costs associated with waste material removal and disposal shall be paid for by the Contractor.

PART 4 - TESTING AND CONTROL

A. The testing laboratory will make tests of in-place density in accordance with ASTM Standards. Backfill operations will be monitored continuously by the testing laboratory at structures. It will be the responsibility of the CONTRACTOR to notify the testing laboratory before backfill operations begin.

PART 5 - MEASUREMENT AND PAYMENT

A. No separate payment shall be made to the CONTRACTOR for the work described in this Section. Such work shall be considered incidental to the project and the payments made under specific Pay Items shall be considered as full compensation for these requirements.

END OF SECTION

SECTION 02228

LOADING & HAULING OF UNCLASSIFIED FILL MATERIAL

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. Perform all required work within the limits of right-of-way and adjacent thereto for loading, hauling, shaping and/or stockpiling of fill material (except excavations specifically described and provided for elsewhere in the specifications).

B. Loading and hauling of all excavated materials.

C. Shape and finish all earthwork in conformance with lines and grades as shown on the plans or as specified by the ENGINEER/LANDSCAPE ARCHITECT.

D. Stockpile all earthwork in conformance with lines and grades as shown on the plans or as specified by the ENGINEER/LANDSCAPE ARCHITECT.

E. Schedule work to avoid property owner inconvenience as practical during construction.

F. Exercise care in operating applicable equipment beneath or adjacent to trees, sidewalks, poles, and other existing features to prevent damage.

G. Restore obstructions removed to accommodate equipment or to facilitate loading, hauling, shaping or stockpiling all earthwork.

1.02 CLASSIFICATION:

A. All material loaded and hauled shall be unclassified, regardless of material encountered.

B. Any reference to rock or any other material on the plans, or in these specifications, is not to be construed as classification of the excavation.

PART 2 - PRODUCTS

2.01 LOADING

A. Loading shall be by rubber wheel, track loader or any other method approved by the ENGINEER/LANDSCAPE ARCHITECT.

B. The loader bucket shall be a standard unit volume to allow for estimation of hauled material.

C. The dump truck(s) shall be standard unit volume to allow for estimation of hauled material.

2.02 HAULING

A. All material shall be delivered to areas specified on plans or as noted on the bid proposal.

B. All hauling equipment shall abide by all applicable local, state and federal rules, regulations and statues. Every effort shall be made to stay on approved truck routes during hauling operations.

2.03 SHAPING

A. All material shall be shaped to conform to grades and lines shown on the plans or as directed by the ENGINEER/LANDSCAPE ARCHITECT.

2.04 STOCKPILING

A. All material shall be stockpiled to conform to grades and lines shown on the plans or as directed by the ENGINEER/LANDSCAPE ARCHITECT.

PART 3 - EXECUTION

3.01 UNCLASSIFIED FILL MATERIAL LOADING, HAULING, SHAPING & STOCKPILING:

A. Perform all loading of unclassified fill material as shown on the plans or noted on the bid proposal.

B. Haul unclassified fill material to areas requiring fill and place in accordance with these specifications. Determination of suitable material will be made by ENGINEER/LANDSCAPE ARCHITECT. Haul unsuitable material to waste sites.

C. Shape, slope and fill sections uniformly as noted on plans or other controlling feature, or as designated by ENGINEER/LANDSCAPE ARCHITECT. Smooth bank to provide a neat finished appearance.

D. Strip, salvage and stockpile topsoil in sufficient quantity to allow a uniform 6-inch lift over all disturbed areas not otherwise surfaced. Topsoil is included in unclassified excavation.

E. Stockpile unclassified fill material as noted on plans or bid proposal, in accordance with these specifications. Determination of stockpile height will be made by the ENGINEER/LANDSCAPE ARCHITECT.

3.03 EXCESS OR UNSUITABLE EXCAVATION:

A. Dispose of excavation in excess of that needed or unsuitable for construction. As directed by the ENGINEER/LANDSCAPE ARCHITECT, excess or unsuitable excavation may be used for widening of embankments, or flattening of slopes, or as otherwise specified.

B. Obtain approval of the ENGINEER/LANDSCAPE ARCHITECT as to disposition and method for disposal of excess or unsuitable excavation.

3.04 GENERAL:

A. Provide all labor, equipment and associated materials to load, haul, shape and/or stockpile unclassified fill material.

PART 4 - MEASUREMENT AND PAYMENT

4.01 LOADING, HAULING & SHAPING OF UNCLASSIFIED FILL MATERIAL:

A. Unclassified fill material, as authorized, shall be measured in its loose position. The volume shall be determined by the average end area method and multiplied by a factor of 1.33 for estimation of hauling quantities. All work performed shall be paid for at the contract unit bid price per cubic yard for loading, hauling, shaping and/or stockpiling of unclassified fill material.

B. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required by the work, all in accordance with the plans and these specifications.

C. Adjustment of any facilities to accommodate loading, hauling, shaping or stockpiling of fill material shall be considered incidental to the bid.

END OF SECTION

SECTION 02230

EXCAVATION

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK

A. This work shall consist of excavating and properly utilization, or otherwise satisfactorily disposal of, all excavated materials, of whatever character, within the limits of work.

B. Excavation shall also consist of constructing, compacting, shaping and finishing of all earthwork in designated areas on the plans, as specified herein, and in conformity with the required line grades and typical cross sections or as directed by the Engineer.

C. When not otherwise included, this item shall include the work described in Section 2101 - Preparation of Right of Way, Section 2102 - Clearing and Grubbing, Section 2236 - Embankment, Section 2238 - Removal of Concrete, and Section 2210 - Subgrade Preparation.

PART 2 - PRODUCTS

2.01 CLASSIFICATION: All excavations shall be unclassified and shall include all materials encountered regardless of their nature or the manner in which they are removed.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

A. Prior to commencing this work, all erosion control and tree protection measures required shall be in place and all utilities located and protected.

B. Construction equipment shall not be operated within the drip line of trees, unless otherwise indicted.

C. Construction materials shall not be stockpiled under the canopies of trees. No excavation or embankment shall be placed within the drip line of trees until tree wells are constructed.

D. All excavation shall be performed as specified herein and shall conform to the established alignment, grades and cross sections.

E. Suitable excavated materials shall be utilized, insofar as practical, in constructing required embankments.

F. The construction of all embankments shall conform to Section 2236 - Embankment. No material shall be stockpiled within the banks of a waterway.

G. Unsuitable excavated materials or excavation in excess of that needed for construction shall be known as "Waste" and shall become the property of the Contractor. It shall become his sole responsibility to dispose of this material off the limits of the right of way in an environmentally sound manner at a permitted disposal site.

H. Adequate dewatering and drainage of excavation shall be maintained throughout the time required to complete the work.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Measurement of the volume of excavation in cubic yards by the average end areas. Cross sectional areas shall be computed from existing ground section to the established line of the subgrade, as shown on typical sections for the limits of the right-of-way or other work limits, including parkway slopes and sidewalk areas.

B. Measurement of the area in square yards of surface area excavated as shown on the typical sections included in the plans.

C. Measurement of the volume of excavation is in cubic yards, based upon the average end areas taken from pre-construction cross sections and planned grades. The planned quantities for excavation will be used as the measurement for payment for this item.

4.02 PAYMENT:

A. This item will be paid for at the contract unit price bid for "Excavation," as provided under the measurement method as included in the bid, which price shall be full compensation for all work herein specified: including dewatering, drainage, subgrade preparation, unless otherwise indicated and the furnishing of all materials, equipment, tools, labor and incidentals necessary to complete the work.

B. When not listed as a separate contract pay item, excavation shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.

C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

END OF SECTION

SECTION 02230

SITE CLEARING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes requirements for clearing and grubbing areas within Contract limits of right of way and other areas shown, including work designated in permits and other agreements.

B. All work including trimming, root pruning and removals: Performed by Licensed Tree Care Expert under the supervision of a Roadside Tree Care Expert.

1.2 DEFINITIONS

A. Clearing: Removal from ground surface and disposal within designated areas, trees, brush, shrubs, down timber, decayed wood, other vegetation, rubbish, and debris as well as removal of fences and incidental structures.

B. Grubbing: Removal and disposal of stumps, buried logs, roots larger than 2 inches, matted roots, and organic materials.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 DISPOSITION OF TREES IN PRIVATE PROPERTY

A. General.
   1. Remove trees and shrubs within limits of right of way unless otherwise indicated in Contract Documents.
   2. Do not cut or damage trees outside right of way unless indicated or written permission has been obtained from affected property owner.
      a. Furnish 3 copies of permission to Project Manager before removal operations commence.

B. Trees and Shrubs to be removed.
   1. Remove trees and shrubs to avoid damage to trees and shrubs designated to remain.
      a. On trees greater than 6 inches diameter at breast height (DBH) remove limbs, crown, and trunk in 8 to 10 foot sections, when necessary, to avoid damage to trees and shrubs designated to remain.

2. Remove trees and shrubs felled within right of way to authorized disposal site following Section 01770.
    a. Fill depressions created by removal with soils material suitable for backfill.

C. Trees and Shrubs to be saved.
1. Protect trees and shrubs within right of way, construction strip, or work areas from defacement, injury, and destruction when delineated on Drawings or field marked to be saved.
    a. See Standard Details for protection and limitations.

2. Root Pruning.
    a. When excavating near trees, prune roots 1 inch and larger. Utilize root pruning equipment specifically designed for this purpose.
    b. When approved by Project Manager, large circular saws used to cut concrete and rock saws may be used.
        1) Saw cut through roots to depth of required excavation.
        2) When excavating very close to trees, dig soil away with shovel, then cut exposed root with saw.

3. Proceed with work within limits of tree drip line with extreme care, using either hand tools or equipment that will not damage trees.
    a. Do not store materials or park equipment under drip line of trees to be saved.
    b. Saw cut roots 1 inch and larger flush with trench wall on tree side of trench.
    c. Backfill around tree roots immediately after completion of construction in vicinity of trees.

4. Protect vegetation from damage by motorized equipment emissions.

5. During working operations, protect trunk, foliage, and root system of trees to be saved with boards or other guards following Standard Details and to prevent damage, injury, and defacement.
    a. Do not pile excavated material adjacent to base of trees.
    b. Do not allow runoff to accumulate around base of trees.
    c. Do not fasten or attach ropes, cables, or guy wires to trees without Project Manager's permission.
        1) When permission is granted, protect tree before fastening or attaching, using burlap wrapping and softwood cleats.
    d. Do not use axes or climbing spurs for trimming or trees to be saved.
    e. Use climbing ropes during trimming and be responsible for damage resulting from these actions.

6. Remove shrubs to be saved, taking sufficient earth ball with roots to maintain shrub.
    a. Temporarily replant if required, and replace at completion of construction in condition equaling what existed before removal.
    b. Replace in kind if transplant fails following Section 02930 for transplanting, planting, watering, and guarantee.

7. Perform tree and shrub repair where required, using tree expert licensed by State of Texas, within 24 hours after damage occurred.

3.2 DISPOSITION OF TREES AND SHRUBS IN DEDICATED PUBLIC SPACE

A. See Texas Department of Natural Resources Forest Service's Roadside Tree Care standards and requirements for disturbance or removal of trees and shrubs in public space in Hidalgo or Cameron Counties, as set forth in permits for this Contract.

3.3 DISPOSITION OF TREES AND SHRUBS IN PARK PROPERTY (MNCP & PC, NPS, AND MPS)

A. Remove trees and shrubs within designated work area specified herein.

1. On trees greater than 6 inches DBH remove limbs, crown, and trunk in 8 to 10 foot sections, when necessary, to avoid damage to trees and shrubs designated to remain.

2. Save and protect from damage, trees within working area marked or noted on Drawings to be saved.

B. Protect trees and shrubs outside designated work strip on Park property from defacement, injury, and damage.

C. Transplant Dogwoods as directed by Park authorities.

D. Park authorities may designate final location of replacement trees within Park property.

3.4 DISPOSITION OF CUT LOGS ON PRIVATE OR PARK PROPERTY

A. When Contract Documents or special agreements require that felled trees be trimmed and cut into selected lengths and stored on site, stockpile them along edge of right of way or in areas requested by property owner or agent with Project Manager’s approval.

B. Unless otherwise required, do not store logs within 100-year floodplain.

3.5 CLEARING AND GRUBBING

A. Clear items specified herein to limits indicated, and remove cleared and grubbed material from site.
1. Do not start earthwork operations in areas where clearing is not complete.
2. Stumps and root mats may be removed concurrently with excavation.
3. Follow erosion, sediment control, and stormwater management measures specified elsewhere.

B. Clear and grub areas to be excavated, areas receiving less than 3 feet of fill, and areas upon which structures are to be constructed.
   1. Remove stumps and root mats in these areas to minimum 1 foot below subgrade or slope surfaces.
   2. Fill depressions made by removal of stumps or roots with soils material suitable for backfill.

C. Clear areas receiving more than 3 feet of fill and cut trees and shrubs as close as practical to existing ground.
   1. Grubbing will not be required.

D. Do not burn without written permission from County Agency.
   1. Burn perishable material under constant care of competent watchmen.
   2. Burn at times and in manner to avoid jeopardizing material designated to remain on property, surrounding cover, and adjacent property.
   3. Disposal of ashes:
      a. Off-site, or
      b. Covered properly, or
      c. Combined with soils material before restoration.
   4. Follow applicable laws and ordinances.

3.6 TOPSOIL

A. Strip existing topsoil from areas to be excavated or graded before Work, and place in well-drained stockpiles in locations with Project Manager's approval.

PART 4 MEASUREMENT AND PAYMENT

4.1 SITE CLEARING

A. Site clearing will not be measured for payment, but cost will be considered incidental to Contract.

END OF SECTION

SECTION 02234

BORROW

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK

A. This work shall consist of required excavation, removal and proper utilization of materials secured from sources obtained by the Contractor and approved by the Engineer.

B. Borrow will only be used when indicated on the plans or as directed by the Engineer and then only from approved sources.

PART 2 - PRODUCTS

2.01 MATERIAL

A. All authorized borrow shall conform to one of the following classes:

1. Class A (Select Borrow): This material shall consist of sand and or other suitable granular material, free from vegetation or other objectionable matter reasonable free from lumps of earth and when tested by standard SDHPT laboratory methods, shall meet the following requirements:

   The Liquid Limits shall not exceed 45
   The Plasticity Index shall not be
   less than 4
   nor more than 15

2. Class B: This material shall consist of suitable non-swelling (soils with plasticity index less than 20) earth material such as loam, clay or other such materials that will form a stable embankment.

3. Topsoil: This material shall consist of approved topsoil material and shall be clean, friable soil capable of supporting plant life. This material shall also be free of stones and all other debris.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS:

A. Prior to commencing this work, all erosion control and environmental measures required shall be in place. All suitable materials removed from excavations shall be used, insofar as practicable in the formation of embankments conforming to Section 02226,

Excavation, Backfill & Compaction for Pavement or Section 02227, Excavation, Backfill & Compaction for Utilities or otherwise be utilized as indicated or as directed by the Engineer and the complete work shall conform to the established alignment, grades and cross section.

B. Additional material necessary to complete the work described above shall be "Borrow" of the class specified.

C. The Contractor shall arrange for borrow from one of the following sources:

1. Existing borrow pit.

2. New borrow pit.

3. Surplus excavated material from a site which has a site development permit.

D. The Contractor shall notify the Engineer three weeks prior to opening pit to permit necessary testing for approval of materials. All borrow sites shall comply with the requirements of the permit.

E. During construction, the borrow sources shall be kept drained, insofar as practicable, to permit final cross sections to be taken when required.

F. The Engineer shall be notified sufficiently in advance of opening any borrow source to permit necessary testing for approval of materials.

G. Borrow sites shall be managed to minimize the impact of the appearance of the natural topographic features and at no time create a potential hazard to the public.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Borrow will be measured by the cubic yard in its final position based on the average end areas method taken from plan cross-sections and plan grades.

B. The plan quantities will be used as the measurement of this item.

4.02 PAYMENT:

A. The accepted quantities of borrow will be paid at the contract unit bid price per cubic yard.

B. Payment for unauthorized work will not be made.

C. Prices bid shall be full compensation for furnishing all labor; for all materials; for all

royalty and freight involved; for all hauling and delivering on the road; and for all tools, equipment and incidentals necessary to complete the work.

END OF SECTION

SECTION 02238

CONCRETE REMOVAL

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. This work shall consist of breaking up, removing and satisfactorily disposing of existing concrete, as classified, at locations indicated or as directed by the Engineer.

B. Existing concrete, when under this section, will be classified as follows:

1. Concrete Curb will include curb and curb-and-gutter combinations.

2. Concrete Slabs will include, but not be limited to, patio slabs, porch slabs, foundation slabs, concrete riprap and concrete pavement.

3. Sidewalks and Driveways will include concrete sidewalks and driveways.

4. Concrete Walls will include all walls, regardless of height and wall footings.

5. Concrete Steps will include all steps and combinations of walls and steps.

6. Abandoned Foundations will include abandoned Electric Department foundations.

7. Miscellaneous Concrete shall include, but not be limited to, manholes, inlets, junction boxes and headwalls, as indicated by the plans or the Engineer.

PART 2 PRODUCTS

2.01 MORTAR:

A. Mortar, for repair of existing concrete structures, shall conform to the requirements thereof in Section 3300 - Cast-In-Place Concrete.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS:

A. Prior to commencing this work, all erosion control and tree protection measures required shall be in place and all utilities located and protected. The existing concrete shall be broken up, removed in accordance with Section 2101 - "Preparing Right-of-Way", and disposed of at a permitted disposal site by the Contractor.

B. Where only a portion of the existing concrete is to be removed and the remaining portion is to continue to serve its purpose, care shall be exercised to avoid damage to the portion that will remain in place.

C. The existing concrete shall be cut along neat lines when indicated, or as established by the Engineer, by sawing with an appropriate type circular concrete saw to a minimum depth of 1/2 inch.

D. Any reinforcing steel encountered shall be cut off 1 inch inside of the concrete sawed line. Any existing concrete which is damaged or destroyed beyond the neat lines so established, shall be replaced at the Contractor's expense.

E. The remaining concrete shall be mortared to protect the reinforcing steel and provide a neat, clean appearance.

F. When applicable, a minimum of 1 foot of steel length shall be cleaned of all old concrete and left in place to tie into the new construction when reinforcement is encountered in the removed portions of structures to be modified.

G. All unsuitable material shall be removed and replaced with approved material.

H. All foundation, walls or other objectionable material shall be removed to a minimum depth of 18 inches below all structures and 12 inches below areas to be vegetated.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Concrete curb when removed as prescribed above, will be measured by the linear foot, in its original position, regardless of the dimensions or size.

B. Concrete slabs and concrete sidewalks and driveways removed as prescribed above will be measured by the square foot or square yard in original position, regardless of the thickness and reinforcing.

C. Concrete steps removed will be measured per linear foot or square yard of each individual step tread including the bottom step.

D. Concrete foundation removed will be measured per square yard each.

E. Miscellaneous concrete removed will be measured per square yard each.

4.02 PAYMENT:

A. This item will be paid for at the contract unit price bid for "Removed Concrete Curb", "Removed Concrete Slab", "Remove Concrete Sidewalks and Driveways", "Removed Concrete Foundations" and "Remove Miscellaneous Concrete", which price shall be full compensation for all work herein specified, including the disposal of all material not required in the work, the furnishing of all materials, equipment, tools, labor and incidentals necessary to complete the work.

B. When not listed as a separate contract pay item, removal of concrete shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.

C. Compensation, whether by contract pay item or incidental work, will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

END OF SECTION

SECTION 02240

LIME STABILIZATION

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. Treating of subgrade, sub-base, and base courses by the pulverization, addition of lime, mixing and compacting the mixed material to the required density.

B. Application to natural ground, embankment, existing pavement, base or sub-bases under this contract, or as directed by the ENGINEER, which shall be constructed as specified herein and in conformity with the typical section, lines, grades as shown on the plans.

1.02 QUALITY ASSURANCE:

A. Comply with the latest published edition (or addended portions thereof) of the following standards and codes:

1. ASTM C—207 or Type N — Requirements for Hydrated Lime
2. ASTM Designation C5 — Quick Lime for Structural Purposes
3. Texas SDHPT Test Method Tex—600—J - Hydrated Lime
4. ASTM D—1557 - Density of Compacted Materials
5. ASTM D-2049 - Density of Compacted Materials
6. Texas SDI-IPT Test Method Tex 113—E — Density of Compacted Materials
7. AASHTO T—99, Method C - Density of Compacted Materials
8. AASHTO M-216 - Hydrated Lime

PART 2 - PRODUCTS

2.01 HYDRATED (DRY) LIME:

A. Use, for stabilization of soils, a dry powder consisting primarily of calcium hydroxide ($Ca(OH)_2$).

B. Provide Material in accordance with Texas SDHPT Test Method TEX— 600—J and conforming to the following chemical composition:

Hydrate Alkalinity, Percent by Weight $Ca(OH)_2$	90% Min.
Unhydrate Lime Content, Percent by Weight CaO	5% Max.
“Free Water” Content, Percent by Weight H_20	4% Max.

And with the following residue retainage:

Residue Retained on No. 6 Sieve	None
Residue Retained on No. 10 Sieve	1% Max.
Residue Retained on No. 30 Sieve	2.5% Max.

C. Store and handle hydrated lime in closed, weather proof containers, storage bins, or bags until immediately before application to the road.

D. Furnish hydrated lime in trucks, as applicable, with weight of lime measured on certified scales and clearly marked on the truck or stamped on a haul ticket.

E. Furnish hydrated lime in bags, as applicable, bearing the manufacturer's certified weight. Bags varying more than five percent may be rejected.

2.02 HYDRATED LIME SLURRY:

A. Provide a pumpable suspension of solids, principally composed of hydrated lime, in water.

B. Provide material with a "Solids Content" having a hydrated alkalinity $Ca(OH)_2$ of not less than 90 percent by weight and a residue retainage equal to the retainage specified in Part 2.01B above.

C. Supply Type B, commercial lime slurry, with a "dry solids content" of at least 31% by weight of the slurry (Grade 1).

D. Procure mixing water only from City of McAllen water mains. The Contractor shall make arrangements with the City Water Department to obtain a meter and subsequent payment for water used.

2.03. QUICKLIME (MASON'S LIME):

A. Provide quicklime, as a dry powder in a tank, to form a lime slurry.

PART 3 - EXECUTION

3.01 GENERAL:

A. Provide a completed course of treated materials containing a uniform lime mixture, free from loose or segregated areas, of required density and moisture content, well bound for its full depth, and with a smooth surface and suitable for placement of subsequent courses.

B. Regulate sequence work, use proper amounts of lime, maintain the work and rework the courses as necessary to meet the requirements of this specification.

C. Construct and shape smooth roadbed to conform with typical sections, lines and grades as shown on the plans, or as directed by the ENGINEER.

D. Excavate materials to be treated to the proposed bottom of lime treatment grade, or secondary grade and remove or windrow to expose secondary grade.

E. Correct any wet or unstable material below the secondary grade by scarifying, adding lime and compacting until uniform stability is achieved.

F. Use a cutting or pulverizing machine, as applicable, to remove subgrade material accurately to secondary grade and to pulverize the material at the same time. When cutting or pulverizing machine is used, the requirement for exposing and windrowing the material is waived.

G. Roll subgrade before use of pulverizing machinery and correct any soft areas that rolling operations shall reveal.

H. Materials for new bases and sub-bases shall be delivered, placed and spread in the required amount per station. The material shall be thoroughly mixed prior to the addition of lime.

I. Lime shall be spread only on that area where first mixing operation can be completed in the same working day.

3.02 SLURRY PLACING:

A. Mix lime, in amounts as shown on plans, or as specified by the Materials Engineering Laboratory, with water in trucks or approved distributors and apply as a thin water suspension or slurry. Provide slurry free of objectionable materials.

B. The distribution of lime at the rates shown on the plans, as directed herein, and/or as directed by the ENGINEER, shall be attained by uniformly successive passes over a measured surface of roadway until the proper moisture and lime content is achieved.

C. Lime slurry distributors shall be equipped with an agitator for maintaining lime and water in a uniform mixture.

3.03 DRY PLACING:

A. Before applying lime, bring the prepared roadway to approximately optimum moister content. Spread lime by an approved screw type spreader box or by bag distribution at the required rate shown in the plans.

B. Distribute lime at a uniform rate with approved equipment and in such a manner as to reduce scattering of lime to a minimum. Lime shall not be applied when wind conditions, in the opinion of the ENGINEER, will cause objectionable blowing of lime to traffic or adjacent properties.

C. Only hydrated lime may be distributed by bag. Motor graders shall **not** be used to spread hydrated lime.

D. Sprinkle material until required lime content has been secured.

3.04 MIXING

A. Mixing procedures shall be the same for “Dry Placing” or “Slurry Placing” or lime.

B. Treatment for Materials in Place:

1. Thoroughly mix material and lime using approved road mixers or other approved equipment, until a homogeneous, friable mixture of material is obtained, free from all clods and lumps.

2. Mix as thoroughly as possible at the time of lime application of materials containing plastic clay or other materials not readily mixed with lime, bring to proper moisture content, seal with a pneaumatic roller, and leave to cure one to four days, as directed by the ENGINEER.

3. During curing period, material shall be kept moist by method(s) approved by the ENGINEER.

4. Uniformily mix, after required curing time, using approved methods.

5. Clods in soil binder - Lime mixture shall be reduced in size by raking, blading, discing, harrowing, scarifying or by other approved pulverization methods such that nonslaking aggregates obtained on the No. 4 sieve are removed. The r remainder of the material shall meet the following requirements when test dry by laboratory sieves:

Minimum Passing 1 3/4 inch	100%
Minimum Passing No. 4 Sieve	60%

C. Treatment of New Material

1. Thoroughly mix and blend, using approved road mixers or other approved equipment, the base or sub-base material, lime and required water until a homogeneous, friable mixture is obtained.

2. When lime is placed as a slurry and mixed by use of blades, the material shall be bladed as the limewater mixture is applied.

D. During the time between application and mixing, hydrated lime that has been exposed to the open air for a period of six hours or more, or to excessive loss due to washing or blowing, shall not be accepted for payment.

3.05 COMPACTION:

A. Compaction of the mixture shall begin immediately after final mixing and in no case later than three calendar days after final mixing.

B. Aerate or sprinkle material as required to provide optimum moisture.

C. Compaction shall begin at the bottom and shall continue until entire depth of mixture is uniformly compacted to 95% of maximum density as determined by AASHTO T-99, Method C.

D. If any portion fails to meet the density specified, it shall be reworked as required to obtain specified density.

3.06 FINISHING, CURING, AND PREPARATION FOR SURFACING:

A. Shape surface after compaction to the required lines, grades, and cross sections, followed by thorough rolling sufficiently light to prevent hair-line cracking.

B. Complete sections shall be moist cured for a minimum of seven days before further coursed are added or any traffic permitted, other than sprinkling equipment.

C. The surface or compacted layer shall be kept moist until covered by other base or paving material, or until an application of CSS-1 or 55-1 emulsified asphalt as a curing seal. Curing seal shall be applied as soon as possible after final rolling at a rate of 0.05 to 0.20 gallons per square yard. The exact rate will be as directed by the ENGINEER.

D. No equipment or traffic will be permitted on lime treated materials for 72 hours after application of curing seal.

3.07 MAINTENANCE;

A. Maintain the completed lime treated material within the limits of contract, in condition satisfactory to the ENGINEER as to grade, crown and cross section until surface course is constructed.

B. Immediately repair all irregularities and defects that may occur at no cost to the City of McAllen of McAllen and as directed by the ENGINEER.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT AND PAYMENT:

A. When included as a separate line item, lime treatment may be measured for payment in

square yards for the thickness of material shown on the plans for the surface area of completed and accepted work or lime will be measured by the ton of 2,000 pounds dry weight. Lime treatment shall be paid for at the contract unit price per square yard or paid at the contract unit cost per ton of 2,000 pounds dry weight.

B. When not included as a separate line item, lime treatment shall be considered incidential to the completion of construction and the costs thereof shall be included in the line items provided.

C. The contract unit price for lime treatment shall be the total compensation for preparing roadbed; for loosening, pulverizing, application of lime, water content of slurry mixture and the mixing water; mixing, shaping, sprinkling, compacting, finishing, curing and maintaining; for manipulations required, for all labor, equipment, fuels, tools and incidentals necessary to complete the work.

D. The contract unit price for lime shall be full compensation for furnishing the material; for all freight involved; for all unloading, storing and hauling; and for all labor, equipment, fuels, tools, and incidentals necessary to complete the work.

END OF SECTION

SECTION 02558

WATER VALVES

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK

A. This work shall consist of furnishing and installing valves as indicted on the plans or as directed by the ENGINEER in accordance with these specifications.

B. Unless otherwise noted, all valves 4 inches and larger shall be AWWA-type valves of suitable design and fully equipped for service buried in the earth, without need for further modification and shall be wrapped with 8 mail polyethylene film with all edges and laps securely taped to provide a continuous wrap.

C. Valve ends on valves 4 inches and larger shall be flanged or mechanical joint. All mechanical joints shall conform to AWWA Specification C111. Flanges shall be dimensioned, faced, and drilled to the 125 pound "American Standard".

D. Valves shall be carefully installed in their respective positions, accessible for operation and repair. Unless shown on the plans otherwise, valves shall be of the same sizes as the pipelines in which they are installed. Stems shall be installed pointing straight upward. The operating nuts of all valves or valve stem extensions shall be no deeper than 18 inches below the top of the valve box cover. Valves shall be left in satisfactory operating condition, free from all distortion and strain.

E. All valve operators shall turn in a counterclockwise direction to open the valve.

PART 2 - PRODUCTS

2.01 VALVE TYPES

A. Gate Valves

1. Gate valves shall only be used for pipe sizes of 12 inches and smaller, unless otherwise noted on the plans.

2. Resilient seat gate valve shall be used and shall conform to AWWA C509. The gate valve shall be a non-rising stem type with inside screw and "O" ring seals. The valve shall have a standard hub equipped with a square operating nut. The body-to-bonnet and bonnet-to-bonnet cover shall use "O' rings as seals.

3. The resilient seat shall be mechanically retained or bonded on the valve gate (\wedge disc).

4. The gate valve shall have protective coating inside and outside of fusion bonded epoxy approved for potable water.

5. The valve stem shall comply with AWWA C509. The material for the valve stem shall be brass or bronze, and shall have a minimum yield strength of 20,000 psi and minimum tensile strength of 60,000 psi. The valve stem shall be compatible and interchangeable with the equivalent sized double disc gate valve models.

6. Gate valves shall have a 2-inch square operating hub nut.

7. The number of turns to open the valve shall be the same or less than the equivalent sized double disc gate valve models. Maximum input torque to open and/or close the valve shall be 200 foot pounds for a 4-inch valve and 300 foot pound for a 6 inch under a working pressure of 200 psi.

8. Before the Work will be accepted, the CONTRACTOR shall provide the ENGINEER with a completed "Water Valve Data Card".

9. Gate valves shall be American Darling, Metroseal by U.S. Pipe, Mueller, or approved equal.

B. Rubber seated Butterfly Valves

1. Butterfly valves will be used in lieu of gate valves for sizes of 14 inches and larger, the butterfly valve shall be of the rubber-seated tight closing type conforming to AWWA C504.

2. The valve body shall be cast iron having integral hubs for the housing shaft bearings and seals. The body ends shall be flanged per AWWA C504 with the flanges designed for installation between Class 125 cast iron flanges or mechanical joint meeting the requirements of AWWA C111.

3. The butterfly valve disc shall be cast iron.

4. The seat shall be bun rubber and shall be mechanically retained on the disc edge by means of 18-8 stainless steel bolts. Seat must also be capable of being replaced in the field without chipping, grinding, or burning out of the old seat or retaining substance. The body seat mating surface shall be 18-8 stainless steel, type 304 mechanically retained.

5. Valve shafts shall be 18-8 stainless steel, type 304 and shall be securely attached to the disc by means of bolts, dowel pins, or taper pins.

6. All butterfly valves shall be side operated. Valve actuator shall be integrally mounted on the valve mounting flange and shall be of the self locking traveling nut type in complete accordance with AWWA C504 requirements. Actuators shall be furnished with a standard 2 inch operating nut and must be designed to permit the adjustment of the valve disc seating without the removal of the housing cover.

7. All butterfly valves shall be tested per AWWA C504

8. Before the work will be accepted, the CONTRACTOR shall provide the ENGINEER with a completed "Water Valve Data Card".

C. Valve Stem Extensions

1. Extension stems shall be provided as necessary to situate the operating nut no greater than 18 inches below the valve cover.

2. Extension stems shall be equipped with stem guides affixed to the valve box at intervals not to exceed ten feet.

3. Stem guides shall be considered a part of the extension. Extension stems and stem guides shall be manufactured items or approved equal.

D. Air and Vacuum Valves

1. Air and vacuum valves shall be of the type that automatically exhaust large quantities of air during the filling of a pipeline and allow air to re-enter enduring draining or when a negative pressure occurs.

2. The inlet and outlet of the valve shall have the same cross-sectional area. The floats shall be guided by a stainless steel guide shaft and seat against a synthetic seat.

3. Valves shall have NPT inlets and outlets.

4. All air and vacuum valves shall be constructed of cast iron with stainless steel trim and bun seating. Valves shall be as manufactured by Val-Matic Valve & Mfg. Corp., Series 100.

E. Fire Hydrants

1. Fire hydrants and their extensions shall be in accordance with AWWA C502, traffic type.

2. Fire hydrants shall have one 5 1/4 inch diameter valve opening; 6-inch mechanical joint of slip on inlet connection; two 2 1/2 inch hose nozzle connections; and one 4 1/2 inch steamer nozzle with National Standard Fire Hose Coupling Screw Threads

or as specified by the OWNER.

3. Fire hydrants shall have a bronze or cast iron, pentagon, operating nut, be designed for 150 psi., working pressure service, and have a normal bury of 4 to 4 1/2 feet unless field conditions require a deeper bury, in which case extensions will be used so as to bring the bottom of the break-off flange 2 to 8 inches above the top of finish grade.

4. The pipe fittings and fire hydrants starting at the street main and ending at the fire hydrant itself shall be lying in a line perpendicular to the streets' centerline or radially on a curvilinear installation.

5. Fire hydrants shall be installed in as near a vertical position as possible and shall have no more than 1/2 inch variation from a vertical line between the breakaway flange and the top of the fire hydrant.

6. Hydrants shall be dry barrel, post-type with compression main valve closing with pressure. They shall have a field lubrication capability. Hydrants shall have a bronze seat ring threaded into a bronze drain ring or bronze or cast iron bushing.

7. Hydrant interior and exterior below the ground line shall be coated with asphalt varnish, and the exterior painted from the top to a point one foot below the ground level flange, consisting of one coat rust inhibitive primer.

8. The bottom plate of the main valve shall be epoxy coated. The shoe of the fire hydrant shall have a 6-inch mechanical joint connection. The inside shall be epoxy coated to prevent corrosion.

9. The nozzle shall be threaded in place and retained by stainless steel locks.

10. Hydrant body shall be threaded to receive the threaded nozzle. Nozzle shall be secured by a stainless steel locking device.

11. Fire hydrant shall contain two drain outlets. The drain outlets shall be constructed of bronze. Hydrant shall be provided with a pentagon operating nut to open counter clockwise and shall have an anti-friction washer between the hold-down nut and the operating nut.

12. Fire hydrant shall be installed at locations as shown on construction plans and in accordance with Standard Detail Drawings.

13. No project will be accepted by the OWNER until all hydrants are operational, accessible and have been tested by the McAllen Fire Department.

14. Before the work will be accepted, the CONTRACTOR shall provide the ENGINEER with a completed "Fire Hydrant Data Card".

15. Hydrants shall be limited the following unless prior written approval is provided by the ENGINEER:

    a. Mueller Centurion A-423

    b. American Darling B-84-B

    c. Kennedy Guardian K-81A

    d. U.S. Pipe Metropolitan

F. Valve Boxes

1. Valve boxes, rings and covers shall be the type, size and materials shown in Standard Detail drawings.

2. No valve box shall be paved over without the permission of the ENGINEER. Paving material shall not remain on valve box covers overnight.

3. Valve boxes shall be fabricated using 6 inch cast-iron sliding type pipe shaft with cover and base casting.

4. Drop covers for vale boxes shall be marked "water" using lettering casted in the cover by the manufacturer.

5. Top of valve box shall be set at finished grade unless otherwise noted.

2.02 WATER VALVE DATA CARD

A. Water Valve Data Card, as shown on Figure 02558-1 and 02558-2, shall be prepared for all types of valves (Gate Valves, Butterfly Valves, Air Release Valves, etc) according to the following instructions:

1. The Valve Number will be assigned by the OWNER at a later date.

2. Vale Size is the nominal diameter of the valve, i.e., 6 inch, 14 inch, or 48 inch. In the case of compound valves give size of main valve and by-pass valve, i.e., 24 inch and 4 inch, or 36 inch and 6 inch.

3. Valve Type is the general description of the valve, such as: Vertical Gate Valve, Horizontal Gate Valve, Vertical Gate Valve with by-pass, Horizontal Gate Valve with by-pass, Butterfly Valve, G lobe Valve, Check Valve, etc.

4. Make and Model refers to the manufacturer, make and model number to identify the valve for replacement parts, such as Mueller No. A-2308-6. This information should

be available from the shop drawings.

5. Number of Turns and Direction to Open is the number of revolutions for the operating nut to make the valve travel from fully closed to fully open, and the direction is either clockwise or counter-clockwise, i.e., 54 turns counter-clockwise. All standard valves shall open counter-clockwise. Operation, turn count, and direction to open will be verified by the ENGINEER prior to installation.

6. Under Project Name is the assigned work order number or name shown on plans.

7. Date Warranty expires is the expiration date, under the contract, for requiring warranty repairs.

END OF SECTION

SECTION 02601

FLEXIBLE BASE

PART I - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. This work shall consist of furnishing and placing a foundation course for surface courses or for other base courses.

B. Flexible base shall be composed of either caliche (argillaceous limestone, calcareous or calcareous clay particles, with or without stone, conglomerate, gravel, sand or other granular materials), crushed stone, gravel, iron ore topsoil, shell, or crushed slag.

C. Flexible base shall be constructed as specified herein in one or more courses in conformance with the details, lines and grades shown on the plans, and as established by the ENGINEER.

PART 2 -PRODUCTS

2.01 MATERIALS:

A. Materials for flexible base shall be crushed or uncrushed as necessary to comply with the requirements hereinafter specified.

B. Materials shall consist of durable, coarse aggregate particles mixed with approved binding materials.

2.02 LIME STABILIZATION:

A. Where shown on the plans, or directed by the ENGINEER, material for flexible base shall be lime stabilized in accordance with the provisions of Section 02240.

2.03 TYPES:

A. Type A - Crushed or broken aggregate (excluding gravel aggregate).

B. Type B - Gravel Aggregate

C. Type C - Iron Ore Topsoil

D. Type D - Shell Aggregate with Sand Admixture

E. Type E - Shell Aggregate with Sand and Caliche Admixture

F. Type F - Caliche

G. Type G - Crushed Slag

H. Unless otherwise noted on the plans or directed by the ENGINEER, the CONTRACTOR may use any other type of material that meets the requirements set forth in the specification test limits herein.

2.04 GRADES:

A. Unless otherwise shown on the plans or directed by the ENGINEER, the final course of base material shall consist of Grades 1, 2, 3, or 4, as specified in Table 02601-1.

B. Base courses or subbase materials, unless otherwise noted on the plans or directed by the ENGINEER, may consist of Grades 1, 2, 3, or 4, as specified in Table 02601-1.

C. All grades shall, when tested in accordance with standard laboratory test procedures, meet the physical requirements set forth in Table 02601-1.

D. Testing of flexible base materials shall be in accordance with the following test procedures:

TEST	TESTING PROCEDURE
Preparation for soil constants and sieve analysis	TEX-101-E
Liquid Limit	TEX-104-E
Plastic Limit	TEX-105-E
Plasticity Index	TEX-106-E
Sieve Analysis	TEX-110-E
Wet Ball Mill	TEX-116-E
Triaxial Test	TEX-117-E (Part I or II)

E. Unless otherwise specified on the plans, samples for testing the material for Soil constants, Gradation and Wet Ball Mill shall be taken prior to the compaction operations.

F. Unless otherwise specified on the plans, samples for triaxial tests shall be taken from the stockpile or from production, as directed by the ENGINEER, where stockpiling is required and from production where stockpiling is not required.

TABLE 02601-1

PHYSICAL REQUIREMENTS FOR FLEXIBLE BASE MATERIALS

TYPES	GRADES							
	Grade 1		Grade 2		Grade 3		Grade 4	
	Triaxial Class 1, Min. compressive strength, psi: 45 to 0 psi lateral pressure and 175 at 15 psi lateral pressure		(Triaxial Class 1 to 2.4) Min. compressive strength, psi: 35 to 0 psi lateral pressure and 175 at 15 psi lateral pressure		(Unspecified Triaxial Class)		(Unspecified Triaxial Class)	
TYPE A	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%
Crushed or Broken Aggregate (excluding gravel aggregate)	1-3/4	0	1-3/4	0-10	1-3/4	0-10	As Shown on Plans	
	7/8"	10-35	No. 4	45-75	No. 40	60-85		
	3/8"	30-50	No. 40	60-85	Max LL	45		
	No. 4	45-65	Max LL	40	Max PI	15		
	No. 40	70-85	Max PI	12	Wet Ball			
	Max LL	35	Wet Ball		Bill Amt	55		
	Max PI	10	Wet Ball Bill Amt	40	Wet Ball Bill Amt	40		
	Wet Ball Bill Amt	40	Max Increase in Passing No. 40	20	Max Increase in Passing No. 40	20		
	Max Increase in Passing No. 40	20						
TYPE B	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%
Gravel Aggregate	N/A		1-3/4	0-10	2-3/4"	0	As Shown on Plans	
			No. 4	30-75	No. 40	45-65		
			No. 40	70-85	Max LL	35		
			Max LL	35	Max PI	12		
			Max PI	12				
TYPE C	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%
Iron Ore Topsoil	N/A		2-1/2"	0	1-3/4	0-10	As Shown on Plans	
			No. 40	50-85	No. 4	30-75		
			Max LL	35	No. 40	70-85		

			Max PI	12	Max LL	35		
TYPE D	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%
Sand-Shell	N/A		1-3/4	0-10	1-3/4	0	As Shown on Plans	
			No. 4	45-65	No. 40	45-65		
			No. 40	50-70	Max LL	35		
			Max LL	35	Max PI	12		
			Max PI	12				
TYPE E	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%
Shell with Sand and Caliche	N/A		1-3/4	0	1-3/4	0-10	As Shown on Plans	
			No. 40	45-65	No. 40	45-65		
			Max LL	35	Max LL	35		
			Max PI	10	Max PI	12		
TYPE F	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%
Caliche	N/A		1-3/4	0	1-3/4	0	As Shown on Plans	
			No. 4	45-75	No. 40	50-85		
			No. 40	50-85	Max LL	40		
			Max LL	40	Max PI	12		
			Max PI	12				
TYPE G	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%
Crushed Blast Furnace Slag	As Shown on Plans							

G. Materials exhibiting reasonably close conformity with the specified gradation and plasticity index are defined by the following criteria:

1. The ENGINEER may accept the material, providing not more than 2 of 10 consecutive gradation tests performed are outside the specified limits on any individual or combination of sieves by no more than 5% and where no two consecutive tests are outside the specified limits.

2. The ENGINEER may accept the material providing not more than 2 of 10 consecutive plasticity index samples tested are outside the specified limit by no more than two points and where no two consecutive tests are outside the specified limit.

2.05 STOCKPILING:

A. When specified on the plans, the material shall be stockpiled prior to delivery on the road. The stockpile shall be not less than the height indicated and shall be made up of layers of material not to exceed the depth shown on the plans.

B. After a sufficient stockpile has been constructed as specified on the plans, the CONTRACTOR may proceed with loading from the stockpile for delivery to the road.

C. In loading from the stockpile for delivery to the road, the material shall be loaded by making successive vertical cuts through the entire depth of the stockpile.

D. If the CONTRACTOR elects to produce the Type A material from more than one material or more than one source, each material shall be crushed separately and placed in separate stockpiles so that at least 75 percent of the material in the course aggregate stockpiles will be retained on the No. 4 sieve and at least 70 percent of the material in the fine aggregate stockpile will pass the No. 4 sieve.

E. The materials shall be combined in a central mixing plant in the proportions determined by the ENGINEER to produce a uniform mixture which meets all of the requirements of the specification. In the event that combinations of the materials produced fail to meet all of the specification requirements, the CONTRACTOR will be required to secure other materials which will meet specifications requirements.

F. The central mixing plant shall be of either the batch or continuous flow type, and shall be equipped with feeding and metering devices which will add the materials into the mixer in the specified quantities.

G. Mixing shall continue until a uniform mixture is obtained.

PART 3 - EXECUTION

3.01 PREPARATION OF SUBGRADE:

A. The roadbed shall be excavated and shaped in conformity with the typical sections shown on the plans and to the lines and grades as established by the ENGINEER.

B. All unstable or otherwise objectionable material shall be removed from the subgrade and replaced with approved material.

C. Flexible base shall not be placed until the Contractor has verified by proof rolling that the subgrade has been prepared and compacted in conformity with Standard Specification Item 02220, "Subgrade Preparation," to the typical sections, lines and grades indicated on the Drawings. Any deviation shall be corrected and proof rolled prior to placement of the flexible base material.

D. All holes, ruts and depressions shall be filled with approved material and, if required, the subgrade shall be thoroughly wetted with water and reshaped and rolled to the extent directed in order to place the subgrade in an acceptable condition to receive the base material.

E. The surface of the subgrade shall be finished to line and grade as established and in conformity with the typical section shown on plans. Any deviation in excess of 1/2 inch in cross section and in a length of 16-feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping and re-compacting by sprinkling and rolling.

F. Sufficient subgrade shall be prepared in advance to insure satisfactory execution of the work.

G. Material excavated in the preparation of the subgrade shall be utilized in the construction of adjacent shoulders and slopes or otherwise disposed of as directed. Any additional material required for the completion of the shoulders and slopes shall be secured from sources indicated on plans or as directed by the ENGINEER.

3.02 PLACEMENT OF FIRST COURSE - TYPE A, TYPE B, TYPE C, TYPE F, AND TYPE G MATERIAL:

A. Immediately before placing the base material, the subgrade shall be checked as to conformity with grade and section.

B. The material shall be delivered in approved vehicles of a uniform capacity, and it shall be the charge of the CONTRACTOR that the required amount of specified material shall be delivered to each 100-foot station.

C. Material deposited upon the subgrade shall be spread and shaped the same day.

D. In the event that inclement weather, or other unforeseen circumstances, render the spreading of the material during the first 24-hour period impractical, the materials shall be scarified and spread as directed by the ENGINEER.

E. Throughout the entire operation the material shall be sprinkled, if directed, and shall be maintained by blading and, upon completion, shall be smooth and shall conform to the typical section indicated on the Drawings and to the established lines and grades, shall then be bladed, dragged and shaped to conform to typical sections as shown on plans.

F. Each lift shall be sprinkled as required to bring the material to optimum moisture content, then compacted to the extent necessary to provide not less than 95 percent nor more than 100 percent of the maximum dry density as determined in accordance with Test Method Tex-114-E. In addition to the requirements specified for density, the full depth of flexible base material shall be compacted to the extent necessary to

remain firm and stable under construction equipment. After each section of flexible base material is completed, tests, as necessary, will be made by the Engineer or designated representative. As a minimum, three in-place density tests per section per day will be taken. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements.

G. All areas and "nests" of segregated coarse or fine material shall be removed and replaced with well graded material, as directed by the ENGINEER.

H. If additional binder is considered desirable or necessary after the material is spread and shaped, it shall be furnished and supplied in the amount directed by the ENGINEER. Such binder material shall be carefully and evenly incorporated with the material in place by scarifying, harrowing, brooming or by other approved methods.

I. The course shall be compacted by methods of compaction hereinafter specified as the "Ordinary Compaction" method or the "Density Control" method of compaction as indicated on the plans, or as directed by the ENGINEER.

1. When the "Ordinary Compaction" method is to be used, the following provisions shall apply:

a) The course shall be sprinkled as required and rolled with approved compaction equipment as directed until a uniform compaction is secured. Throughout this entire operation, the shape of the course shall be maintained by blading. Upon completion, the surface shall be smooth and in conformity with the typical sections shown on plans and the established lines and grades.

b) In the area on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section and in a length of 16-feet measured longitudinally shall be corrected by loosening, adding or removing approved material, as required reshaping and re-compacting by sprinkling and rolling.

c) All irregularities, depressions and weak spots which develop in the laid course shall be corrected immediately by scarifying the areas affected, adding approved material as required, reshaping and recompacting by sprinkling and rolling.

2. When the "Density Control" method of compaction is to be used, the following provisions shall apply:

a) The course shall be sprinkled as required and compacted to the extent necessary to provide not less than the percent density as hereinafter specified under "Density".

b) In addition to the requirement specified for density, the full depth of the flexible base shown on the plans shall be compacted to the extent necessary to remain firm and stable under construction equipment.

c) After each section of flexible base is completed, tests as necessary will be made by the ENGINEER. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements.

d) Throughout this entire operation, the shape of the course shall be maintained by blading, and the surface upon completion shall be smooth and in conformity with the typical sections shown on the plans and to the established lines and grades.

e) In the areas on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section and 16 feet in length, measured longitudinally, shall be corrected by loosening, adding or removing approved material as required, reshaping and recompacting by sprinkling and rolling.

f) All irregularities, depressions, and weak spots which develop shall be corrected immediately by scarifying the areas affected, adding approved material as required, reshaping and recompacting by sprinkling and rolling. Should the base course, due to any reason or cause, lose the required stability, density or finish before the surfacing is complete; it shall be re-compacted and refinished at the sole expense of the CONTRACTOR.

J. Where Type C material is used, the material shall be scarified, thoroughly wetted, mixed, manipulated, and bladed so as to secure a uniformly wetted material, and pulled in over the subgrade in courses and set under the action blading and rolling. The work of mixing, blading, rolling, shaping, and subsequent maintenance shall be performed by the continuous use of sufficient number of satisfactory rollers and power maintainers with adequate scarifier attachments.

3.03 PLACEMENT OF FIRST COURSE - TYPE D MATERIAL:

A. Immediately before placing the base material, the subgrade shall be checked as to conformity with grade and section, and corrections made if necessary.

B. All materials shall be delivered in approved vehicles of a uniform capacity.

C. The required amount of shell shall be uniformly spread across the section and allowed to dry sufficiently to insure proper slaking and mixing of the binder material. Immediately upon completion of the drying period, as determined by the ENGINEER, the specified amount of sand admixture, as required to produce a

combined material meeting the requirements hereinbefore specified, shall be spread uniformly across the shell.

D. The material shall then be sprinkled as required and thoroughly mixed by blading and harrowing, or other approved methods.

E. Failure to proceed with the placing of sand admixture or mixing and placing operations will be grounds for the suspension of placing of shell.

F. Under no conditions will the CONTRACTOR be allowed to place an excessive amount of shell without proceeding with the mixing and placing operations.

G. The course shall be compacted by the method of compaction hereinafter specified as the "Ordinary Compaction" method or the "Density Control" method of compaction as indicated on the plans, or as directed by the ENGINEER.

1. When the plans indicate that the "Ordinary Compaction" method is to be used, the following provisions shall apply:

a) After mixing, all material shall be windrowed, and then spread over the section in layers.

b) The layer shall not exceed 2 inches in loose depth.

c) If necessary to prevent segregation, the material shall be wetted in the windrow prior to spreading.

d) After each lift is spread, it shall be sprinkled and rolled to secure maximum compaction as directed by the ENGINEER. Succeeding layers shall then be placed similarly until the course is completed.

e) All areas and "nests" of segregated coarse or fine material shall be removed and replaced with well graded material, as directed by the ENGINEER.

f) The course shall then be sprinkled as required and rolled as directed until a uniform compaction is secured.

g) Throughout this entire operation, the shape of the course shall be maintained by blading; and the surface, upon completion, shall be smooth and in conformity with the typical sections shown on plans, and to the established lines and grades.

h) In the areas on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section and 16-feet in length, measured longitudinally, shall be corrected by loosening, adding or removing material, reshaping and re-compacting by sprinkling and rolling.

i) All irregularities, depressions, or weak spots which develop shall be corrected immediately by scarifying the areas affected, adding suitable material as required, reshaping and re-compacting by sprinkling and rolling.

2. When the plans indicate that the "Density Control" method of compaction is to be used, the compaction method shall be the same as prescribed for Type A, Type B, Type C, Type F and Type G material.

H. When indicated on the plans or permitted by the ENGINEER, Type D material may be mixed in a central mixing plant and delivered to the road as a combined mixture. When this method is used, the combined mixture shall meet the requirements for type D material as hereinbefore specified and the placing and compaction requirement shall be the same as prescribed for Type A, Type B, Type C, Type F and Type G material.

3.04 PLACEMENT OF FIRST COURSE - TYPE E MATERIAL:

A. The construction methods for placing the first course of Type E material shall be the same as prescribed for Type D material except that after the shell and sand have been placed, the prescribed amount of caliche shall then be spread across the sand and shell.

B. The composite mixture shall then be sprinkled as required and thoroughly mixed by blading and harrowing or other approved methods.

C. Compaction of the first course of Type E material shall be the same as prescribed above for Type D material.

D. Failure to proceed with placing the sand and caliche admixture or mixing and placing operations will be grounds for the suspension of placing of shell.

E. Under no conditions will the CONTRACTOR be allowed to place an excessive amount of shell without proceeding with the mixing and placing operations.

3.05 PLACEMENT OF SUCCEEDING COURSES - ALL MATERIAL TYPES:

A. Construction methods shall be the same as prescribed for the first course.

B. Prior to placing the surfacing on the completed base, the base shall be "dry cured" to the extent directed by the ENGINEER.

3.06 REWORKING AN EXISTING BASE COURSE

A. Existing base courses shall be reworked in accordance with TxDOT Item 251, or as directed by the ENGINEER, and result in a section that conforms the approved lines and grades.

3.07 DENSITY CONTROL:

A. When the "Density Control" method of compaction is indicated on the plans, each course of flexible base shall be compacted to the percent density shown on the plans.

B. The testing will be as outlined in Test Method Tex-114-E.

C. It is the intent of this specification to provide that the part of the base included in the top 8 inches, immediately below the finished surface of the roadway, be not less than 100 percent of the density, as determined by the compaction ratio method.

D. Field density determination shall be made in accordance with Test Method Tex-115-E.

3.08 TOLERANCES:

A. Flexible base will be measured by the square yard of surface area of completed and accepted work based on the thickness of flexible base as shown on the plans.

1. The ENGINEER may accept the work providing not more than 25 percent of the density tests performed each day are outside the specified density by no more than three pounds per cubic foot and where no two consecutive tests on continuous work are outside the specified limits.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Flexible base will be measure by the square yard of surface area of completed and accepted work based on the thickness of flexible base as shown on the plans.

1. The flexible base shall be measured for depth by the units of 2,000 square yards minimum, with one measurement taken at a location selected by the ENGINEER. There shall be a minimum of three (3) locations measured per project.

2. In that unit where flexible base is deficient by more than 1/2 inch in thickness, the deficiency shall be corrected by scarifying, adding material as required, reshaping and re-compacting by sprinkling and rolling.

3. No additional payment over the contract unit price will be made for any flexible base of a thickness exceeding that required by plans.

B. The CONTRACTOR shall schedule his operations in such a manner as to facilitate the measurement of the pay item.

C. The ENGINEER may accept the work provided no more than 20% depth tests performed are deficient by not more 1/2 inch and where no two consecutive tests on continuous work are outside the specified depth.

4.02 PAYMENT:

A. The accepted quantities of flexible base of the type, grade, and compaction method specified will be paid at the contract unit bid price per square yard, complete and in place.

B. Where "Ordinary Compaction" is used, all sprinkling, rolling, and manipulation required will not be paid for directly, but will be incidental to this bid items.

C. The unit prices bid shall each be full compensation for shaping and fine grading the roadbed; for securing and furnishing all materials, including all royalty and freight involved; for furnishing scales and labor involved in weighing the material when required; for loosening, blasting, excavating, screening, crushing and temporary stockpiling when required; for loading all materials for all hauling and delivering on the road; for spreading, mixing, blading, dragging, shaping and finishing, and for all manipulation, labor, tools and incidentals necessary to complete the work.

END OF SECTION

SECTION 02610

PRIME COAT

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION:

A. Prime coat shall consist of the application of asphaltic materials on a newly completed base course and/or other approved area, which shall be applied in accordance with these specifications, as shown on the plans, and as directed by the ENGINEER.

1.02 QUALITY ASSURANCE:

A. Test and Certification of Bituminous Materials.

1. Bituminous materials to be tested in accordance with the requirements of AASHTO M-82 and sampled in conformance with AASHTO T-40.

2. Supply, at the time of delivery of each shipment of asphalt, two certified copies of test reports from the supplying vendor to the ENGINEER.

3. Test reports shall indicate name of vendor, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, purchase order number, and result of specified tests.

4. The test report shall be signed by an authorized representative of the vendor and certify that the product delivered conforms to the specifications for type and grade indicated.

5. Certified test reports and the testing required in the preparation of such report shall be at no cost to the City.

6. Final acceptance of bituminous materials shall be dependent on the determination by the ENGINEER that the material meets prescribed standards.

PART 2- PRODUCTS

2.01 MEDIUM CURING CUTBACK ASPHALT:

A. Medium-curing liquid asphalt, designated by the letters MC, shall consist of an uncracked petroleum base stock, produced by the processing of asphaltic or semi-asphaltic base crude petroleum, blended with a kerosene-type solvent. The base stock for all MC materials shall be straight run asphalt produced within the penetration range of 100 to 300, and the end point of the kerosene type solvent shall not exceed

525° F. Medium curing liquid cutback asphalt shall be free from water and show no separation.

B. Medium curing cutback asphalt shall consist of materials specified above and shall conform to the requirements set forth in Table 2610-1.

TABLE 2610-1

Specification Designation	AASHTO Test Method	ASTM Test Method	MC 30	MC 70	MC 250	MC 800	MC 3000
Flash Point (Open Cleave) °F, Min.	T 48	D 92	100	100	150	150	150
Viscosity, 140°F, Kinematic, CS	T 201	D 2170	30 - 60	70 - 140	250 - 500	800 - 1600	3000 – 6000
Furol Visocity at:	T 72	D 88					
77° F (Sec.)			75-150				
122° F (Sec.)				60-120			
140° F (Sec.)					125-250		
180° F (Sec.)						100-200	300-600
Distillation Distillate (% of Total Distillate to 680° F)	T 78	D 402					
437° F			0-25	0-20	0-10	0	0
500° F			40-70	25-60	20-55	10-35	0-15
600° F			75-93	75-90	70-85	65-80	50-75
Reside from Distillation to 680° F Volume % by Difference Min.			50	55	67	75	80
Tests on Residue from Distillation Penetration at 77° F	T 49	D 5	120 - 250	120 - 250	120 - 250	120 - 250	120 – 250
* Ductility 77° F, cm, Min.	T 51	D 113	100	100	100	100	100
Solubility in CCl_4, % Min.	T 44		99.5	99.5	99.5	99.5	99.5
Water, % Max.	T 55	D 95	0.2	0.2	0.2	0.2	0.2
Reaction to Spot Test	T 102**		0	0	0	0	0

* If penetration of residue is more than 200 and its ductility at 77° F is less than 100, the material will be acceptable if the ductility at 60° F is greater than 100.

** Using 85% Standard Naptha and 15% Xylene.

NOTE: Viscosity tests may be made by either Kinematic or Furol test methods.

C. Unless otherwise noted on the plans or directed by the ENGINEER, cutback asphalt Grade MC-30 shall be used.

2.02 BLOTTER MATERIAL:

A. Supply blotter material consisting of native sand and/or sweepings from base course.

B. Native sand shall be local material obtained from approved sources as approved by the ENGINEER.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS:

A. Unless otherwise specified on the plans or required by the ENGINEER, only asphaltic material shall be used. Where required, a combination of asphaltic and blotter material shall be used.

B. Application of Asphaltic Materials Only.

1. Apply prime coat to prepared surface when ambient air temperature is above 40° F and rising and shall not be applied when the ambient air temperature is below 50° F and falling.

2. Apply prime coat to surfaces that have been cleaned by sweeping or other approved methods and where base is thoroughly dry and satisfactory for receiving prime coat.

3. Apply prime coat to cleaned base, at a rate of 0.2 to 0.5 gallons per square yard of surface area, using an approved type of self-propelled pressure distributor so constructed and operated to distribute the material evenly and smoothly.

4. Provide necessary facilities for the determination of temperature of asphaltic material in all heating equipment and distributors; and for determination of rate at which it is applied; and for securing uniformity at the junction of two distributor loads.

5. Keep in clean and good working condition all storage tanks, piping, reports, booster tanks and distributors used in the storage and handling of asphaltic materials.

6. Operate all associated equipment in a manner such that there is no contamination of asphaltic material with foreign material.
7. Calibrate distributor and furnish ENGINEER with an accurate and satisfactory record of such calibrations.

8. Recalibrate distributor, in a manner satisfactory to the ENGINEER, after the beginning of work, should the yield on the asphaltic material applied appear to be in error.

9. No traffic, hauling or placing of subsequent courses shall be permitted over freshly applied prime coat until authorized by the ENGINEER.

10. Apply asphaltic material at a temperature within 15° F of temperature of application selected by the ENGINEER based on temperature viscosity relationship noted in Table 2610-1.

11. Maintain surface until work is Blotter Material.

C. Application of Asphaltic and Blotter Material

1. Haul blotter material in vehicles of uniform capacity and placed on shoulders at a spacing designated by the ENGINEER.

2. After application of asphaltic material as specified above, cover surface with blotter material as directed by the ENGINEER.

3. After application of blotter material, drag surface with approved drag broom, evenly and smoothly distributing the blotter material. Brooming or dragging operation shall continue, as directed by the ENGINEER, until the course has properly cured under traffic.

PART 4 - MEASUREMENT AND PAYMENT

4.01 PRIME COAT:

A. When listed as a separate contract pay item “Prime Coat”, asphaltic material for prime coat will be measured for payment at point of delivery on the project in gallons at applied temperature. Payment will be paid at the unit bid price for "Prime Coat".

B. When not listed as a separate contract pay item, prime coat shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.

C. Compensation, whether by contract pay item or incidental work will be for furnishing all material, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

4.02 BLOTTER MATERIALS:

A. Blotter material will be considered incidental to asphaltic material for prime coat with no direct payment.

END OF SECTION

SECTION 02612

HOT MIX ASPHALT CONCRETE PAVEMENT

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Hot mix asphalt concrete (HMAC) pavement shall consist of a binder course, a leveling up course, a surface course or a combination of the courses as shown on the plans, or as directed by the ENGINEER.

B. HMAC pavement shall be composed of a compacted mixture of mineral aggregate and asphaltic material, constructed on previously completed and approved subgrade, subbase course, base course, or existing pavement.

C. HMAC pavement shall be in accordance with the specifications herein and in conformity with the lines, grades, quantities and typical sections in the contract and/or as directed by the ENGINEER.

1.02 QUALITY CONTROL:

A. HMAC pavement and its constituent part shall conform to the ASTM, AASHTO and/or TxDOT test methods noted below.

PART 2 - PRODUCTS

2.01 ASPHALTIC MATERIALS:

A. Asphalt cement binders shall be uncracked petroleum asphalt and shall be carefully refined, by steam, vacuum, or solvent, from asphaltic or semi-asphaltic base crude petroleum at a temperature not to exceed 700° F. Asphalt cements shall be free from thermal decomposition products and shall not be blended with any materials which have been subjected to cracking or produced from a crude petroleum source other than that of the original material. The asphalt cement shall not contain residues from non-asphaltic sources. Asphalt cement shall be homogeneous, free from water, and shall not foam when heated to 347° F.

B. Paving asphalt shall be classified by penetration or viscosity and shall conform to the requirements set forth in one of the following tables as designated by the ENGINEER. The CONTRACTOR may supply asphalt meeting the requirements of one of the following tables provided that the CONTRACTOR obtains prior approval of the ENGINEER and with the provision that once approval has been obtained, that the CONTRACTOR will remain with that grade throughout the project.

TABLE 2612-1

Specification	AASHTO Test	ASTM Test						
Designation	Method	Method	40 to 50	60 to 70	85 to 100	120 to 150	150 to 200	200 to 250
Flash Point (Open Cup) Min	T48	D92	--	450	450	450	450	350
Penetration of Orig. Sample at 77° F	T49	D5	40 to 50	60 to 70	85 to 100	120 to 150	150 to 200	200 to 250
Thin-Film Oven Loss, Hours at 325°F, % Max	T179	D1754	0.75	0.75	0.75	0.75	1.00	1.00
Test of Residue from Thin-Film Oven Test; % of Orig. Pen., Min.	T49	D5	52	50	50	50	50	50
Ductility at 77° F cm. after los at 325° F, Min.	T51	D113	50	50	100	100	100	100
Solubility in CCl_4 Min.	T44*	None	99.5	99.5	99.5	99.5	99.5	99.5
Reaction to Spot Test	T102**	None	0	0	0	0	0	0

* Procedure No. 1 with CCl_4 substituted for CS_2.

** Using 85% Standard Naphtha Solvent and 15% Xylene.

TABLE 2612-2

TYPE-GRADE	OA-30		OA-175*8		OA-400	
	Min	Max	Min	Max	Min	Max
Penetration at 32^0 F, 200 g, 60 sec	15	--	--	--	--	--
Penetration at 77^0 F, 100 g, 5 sec	25	35	150	200	--	--
Penetration at 115^0 F, 50 g, 5 sec	--	65	--	--	--	--
Ductility at 77^0 F, 5 cm/min, cms; Original OA	2	--	70	--	--	--
Flash Point COC, ^{0}F	450	--	425	--	425	--
Softening Point, R&B, ^{0}F	185	--	95	130	--	--
Thin Film Oven Test, 1/8 in. Film 50 g, 5 hrs, 325^0 F, % Loss by wt.	--	0.4	--	1.4	--	20
Penetration of Residue, at 77^0 F, 100 g, 5 sec % of Original Pen	--	--	40	--	--	--
Ductility of Residue at 77^0F, 5 cm/min, cms	--	--	--	100	--	--
Solubility in Trichloroethylene, %	99	--	99	--	99	--
Spot Test on Original OA	Neg		Neg		Neg	
Float Test at 122^0 F, sec	--	--	--	--	120	150
Test on 85 to 115 Pen. Residue* Residue by Wt., %	--	--	--	--	75	--
Ductility, 77^0 F, 5 cm/min: Original Res, cms	--	--	--	--	100	--
Subjected to Thin Film Test, cms	--	--	--	--	100	--

*Determined by Vacuum Distillation (by evaporation if unable to reduce by vacuum).
** For use with Latex Additive only.

TABLE 2612-3

PROPERTIES	AC-1.5		AC-3		AC-5		AC-10		AC-20		AC-40	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Viscosity, 140^0 F stokes …	150	50	300	100	500	100	1000	200	2000	400	4000	800
Viscosity, 275^0 F stokes …	0.7	--	1.1	--	1.4	--	1.9	--	2.5	--	3.5	--
Penetration, 77^0 F 100 g, 5 sec	250	--	210	--	135	--	85	--	55	--	35	--
Flash Point, COC, ^{0} F	425	--	425	--	425	--	450	--	450	--	450	--
Solubility in trichloroethylene, percent …	99	--	99	--	99	--	99	--	99	--	99	--
Test on residues from thin film oven test: Viscosity, 140^0 F stokes …	--	450	--	900	1500	--	3000	--	6000	--	--	12000
Ductility, 77^0 F, 5 cms per min, cms	100	--	100	--	100	--	70	--	50	--	30	--
Spot Test	Negative for all grades											

C. A minimum of two percent, by weight, latex additive (solids basis) shall be added to the OA-175 Asphalt or to AC-5 Asphalt when specified in the contract. The latex additive shall be governed by the following specifications:

The latex is to be an anionic emulsion of butadiene-styrene low-temperature copolymer in water, stabilized with fatty-acid soap so as to have good storage stability, and possessing the following properties:

Monomer ratio, B/S	70/30
Minimum solids content	67%
Solids content per gal.@ 67%	5.3 lbs.
Coagulum on 80-mesh screen	0.01% max.
Type Anti-oxidant	staining
Mooney viscosity of Polymer (M/L 4@212° F)	100 min.
pH of Latex	9.4 - 10.5
Surface tension	28-42 dynes/cm2

The finished latex-asphalt blend shall meet the following requirements:

Viscosity at 140° F, stokes	1500 max.
Ductility at 39.2° F, 1 cm. per min., cm.	100 min.

D. Asphalt content shall be within the limits noted below:

Table 2612-4

HMAC Type	Percent of Mixture by Weight	Percent of Mixture by Volume
"A"	3.5 - 7.0	8.0 - 16.0
"B"	3.5 - 7.0	8.0 - 16.0
"C"	3.5 - 7.0	8.0 - 16.0
"D"	4.0 - 8.0	9.0 - 19.0
"F"	3.5 - 6.5	8.0 - 16.0

E. At the time of delivery of each shipment of asphalt, the vendor supplying the material shall deliver to the purchaser certified copies of the test report which shall indicate the name of the vendor, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, and results of the above-specified tests. The test report shall be certified and signed by an authorized representative of the vendor that the product delivered conforms to the specifications for the type and grade indicated.

F. Until the certified test reports and samples of the material have been checked by the ENGINEER to determine their conformity with the prescribed requirements, the material to which such report relates and any work in which it may have been incorporated as an integral component will be only tentatively accepted by the City. Final acceptance will be dependent upon the determination of the ENGINEER that the material involved fulfills the requirements prescribed therefor. The certified test reports and the testing required in connection with the reports will be at the expense to the City.

G. Unless otherwise specified in these specifications or in the Supplementary Specifications, the various grades of paving asphalt shall be applied at a temperature range of from 210° F to 325° F, the exact temperature to be determined by the ENGINEER.

H. Paving asphalt shall be heated in such a manner that steam or hot oils will not be introduced directly into the paving asphalt during heating. The CONTRACTOR shall furnish and keep on the site, at all times, an accurate thermometer suitable for determining the temperature of the paving asphalt.

I. HMAC asphalt shall be the grade having the highest penetration, within specified limits, to produce a mix having a maximum stability of the compacted mixtures.

J. Only one (1) grade of asphalt shall be required unless otherwise shown on the plans or as required by the ENGINEER.

2.02 AGGREGATES:

A. HMAC aggregate will be tested in accordance with the following test standards:

AASHTO T-30	Mechanic Testing
AASHTO T-27	Passing No. 200 Sieve
AASHTO T-89	Liquid Limit
AASHTO T-96	Los Angeles Abrasion
AASHTO T-104	Soundness (Magnesium Sulfate)
ASTM C – 131	Resistance to Degradation
ASTM C – 136	Sieve Analysis
ASTM C – 2419	Sand Equivalence Value
TxDOT Tex -106-E	Method of Calculating Plasticity Index of Solids
TxDOT Tex-217 – F	(I & II) Determination of Deleterious Materials and Decantation Test
TxDOT Tex-203 – F	Quality Tests for Mineral Aggregates

B. Aggregates shall have an abrasion of not more than 40 for all courses except the non-skid surface course, which shall have an abrasion of not more than 35.

C. When properly proportioned, HMAC aggregate shall produce a gradation which will conform to the limitations for classification for HMAC type shown below, or as directed by the ENGINEER.

D. Course aggregate to be crushed limestone rock or crushed gravel with hydrated lime or limestone filler. (Crushed gravel shall be per TxDOT Specifications.)

E. Binder aggregate to be composed of 15% crushed limestone screening or as directed by the engineer.

1. Type "A" - Course Graded Base Course

	Percent Aggregate by Weight or Volume
Passing 2" sieve	100
Passing 1-3/4" sieve	95 to 100
Passing 1-3/4" sieve, retained on 7/8"sieve	16 to 42
Passing 7/8" sieve, retained on 3/8" sieve	16 to 42
Passing 3/8" sieve, retained on No. 4 sieve	10 to 26
Passing No. 4 sieve, retained on No. 10 sieve	5 to 21
Total retained on No. 10 sieve	68 to 84
Passing No. 10 sieve, retained on No. 40 sieve	5 to 21
Passing No. 40 sieve, retained on No. 80 sieve	3 to 16
Passing No. 80 sieve, retained on No. 200 sieve	2 to 16
Passing No. 200 sieve	1 to 8

2. Type "B" - Fine Graded or Leveling-Up Course

	Percent Aggregate by Weight or Volume
Passing 1" sieve	100
Passing 7/8" sieve	95 to 100
Passing 7/8" sieve, retained on 3/8" sieve	21 to 53
Passing 3/8" sieve, retained on No. 4 sieve	11 to 42
Passing No. 4 sieve, retained on No. 10 sieve	5 to 26
Total retained on No. 10 sieve	58 to 74
Passing No. 10 sieve, retained on No. 40 sieve	6 to 32
Passing No. 40 sieve, retained on No. 80 sieve	4 to 21
Passing No. 80 sieve, retained on No. 200 sieve	3 to 21
Passing No. 200 sieve	1 to 8

3. Type "C" - Course Graded Surface Course

	Percent Aggregate by Weight or Volume
Passing 7/8" sieve	100
Passing 5/8" sieve	95 to 100
Passing 5/8" sieve, retained on 3/8" sieve	16 to 42
Passing 3/8" sieve, retained on No. 4 sieve	11 to 37
Passing No. 4 sieve, retained on No. 10 sieve	11 to 32
Total retained on No. 10 sieve	54 to 74
Passing No. 10 sieve, retained on No. 40 sieve	6 to 32
Passing No. 40 sieve, retained on No. 80 sieve	4 to 27
Passing No. 80 sieve, retained on No. 200 sieve	3 to 27
Passing No. 200 sieve	1 to 8

4. Type "D" - Fine Graded Surface Course

	Percent Aggregate by Weight or Volume
Passing 1/2" sieve	100
Passing 3/8" sieve	85 to 100
Passing 3/8" sieve, retained on No. 4 sieve	21 to 53
Passing No. 4 sieve, retained on No. 10 sieve	11 to 32
Total retained on No. 10 sieve	54 to 74
Passing No. 10 sieve, retained on No. 40 sieve	6 to 32
Passing No. 40 sieve, retained on No. 80 sieve	4 to 27
Passing No. 80 sieve, retained on No. 200 sieve	3 to 27
Passing No. 200 sieve	1 to 8

5. Type "F" - Fine Graded Surface Course

	Percent Aggregate by Weight or Volume
Passing 3/8" sieve	100
Passing No. 4 sieve	95 to 100
Passing No. 4 sieve, retained on No. 10 sieve	58 to 73
Passing No. 10 sieve, retained on No. 40 sieve	6 to 26
Passing No. 40 sieve, retained on No. 80 sieve	3 to 13
Passing No. 80 sieve, retained on No. 200 sieve	2 to 11
Passing No. 200 sieve	1 to 8

2.03 PRIME COAT:

A. Prime coat, when specified on the plans, or directed by the ENGINEER, shall be in accordance with Section 02610 - Prime Coat, and as specified herein.

B. Prime coat shall be applied to the surfaces of bases at least 12 hours prior to placing the HMAC unless otherwise directed by the ENGINEER.

C. Asphalt prime shall be applied uniformly at the rate in accordance with Section 02610 - Prime Coat.

D. In order to prevent lapping at the junction of two applications, the distributor shall be promptly shut off. A hand spray shall be used to touch up all spots unavoidably missed by the distributor.

E. Immediately prior to application of the asphalt prime, an inspection will be made by the ENGINEER to verify that the base course has been constructed as specified. Also, all loose and foreign material shall be removed by light sweeping. Material so removed shall not be mixed with cover aggregate.

F. The surface to be primed shall be in a smooth and well-compacted condition, true to grade and cross section, and free from ruts and inequalities.

G. The pressure distributor used for applying prime coat material shall be equipped with pneumatic tires and shall be so designed and operated as to distribute the prime material in a uniform spray without atomization, in the amount and between the limits of temperature specified. It shall be equipped with a speed tachometer registering feet per minute and so located as to be visible to the truck driver to enable him to maintain the constant speed required for application at the specified rate.

H. The pressure distributor shall be equipped with a tachometer registering the pump speed, pressure gauge, and a volume gauge. The rates of application shall not vary from the rates specified by the ENGINEER by more than 10%. Suitable means for accuracy indicating at all times the temperature of the prime material shall be provided. The thermometer well shall be so placed as not to be in contact with a heating tube.

I. The distributor shall be so designed that the normal width of application shall be not less than 6 feet, with provisions for the application of lesser width when necessary. If provided with heating attachments, the distributor shall be so equipped and operated that the prime material shall be circulated or agitated through the entire heating process.

J. The asphalt prime coat should preferably be entirely absorbed by the base course and, therefore, require no sand cover. If, however, it has not been completely absorbed prior to the start of placing the asphalt concrete mixture and in the meantime it is necessary to permit traffic thereon, sufficient sand shall be spread over the surface to blot up the excess liquid asphalt and prevent it from being picked it up by traffic. Also, sand shall be used in areas where traffic may pass over the prime coat. Prior to placing the asphalt concrete, loose or excess sand shall be swept from the base. If a sand cover is specified in the Supplementary Specifications or noted on the plans to cover asphalt prime, it shall be applied within 4 hours after the application of said prime coat, unless otherwise ordered by the ENGINEER.

K. Liquid asphalt shall be prevented from being sprayed upon adjacent pavements, structures, guard rails, guide posts, culvert markers, trees, and shrubbery that are not to be removed; adjacent property and improvements; other facilities or that portion of the traveled way being used by traffic.

L. The CONTRACTOR shall protect the prime coat against all damage and markings, both from foot and vehicle traffic. Barricades shall be placed where necessary to protect the prime coat. If, after the prime coat has been applied to the satisfaction of the ENGINEER and has been accepted, if it is disturbed by negligence on the part of the CONTRACTOR, it shall be restored at his expense to its condition at the time of acceptance. No material shall be placed until the prime coat is in a condition satisfactory to the ENGINEER.

2.04 TACK COAT:

A. If the asphalt concrete pavement is being constructed directly upon an existing hard-surfaced pavement, a tack coat shall be evenly and uniformly applied to the existing pavement prior to the placing of the new asphalt concrete. The surface shall be free of water, all-foreign material, or dust when the tack coat is applied. No area shall be treated in any one day greater than will be covered by the asphalt concrete during the same day. Traffic will not be permitted over tack coating.

B. Tack coat for HMAC shall consist of either rapid curing cut-back asphalt RC-2 diluted by addition of (not to exceed 15 percent by volume) an approved grade of gasoline and/or kerosene; emulsified asphalt, EA-11M diluted with 50 percent water, or a cut-back asphalt made by combining 50 to 70 percent of the asphaltic materials specified for the paving mixture with 30 to 50 percent gasoline and/or kerosene by volume.

C. Tack coat shall conform to the requirements of Section 02620 - Tack Coat, or as specified herein.

D. Application of tack coat shall be 0.10 to 0.15 gallons per square yard, or as directed by the ENGINEER.

E. A similar tack coat shall be applied to the surface of any course if, in the opinion of the ENGINEER, the surface is such that a satisfactory bond cannot be obtained between it and the succeeding course.

F. When required, the contact surfaces of all cold pavement joints, curbs, gutters, manholes, and the like shall be painted with a tack coat immediately before the adjoining asphalt concrete is placed. Asphalt tack coat shall be applied in controlled amounts as shown on the plans or determined by the ENGINEER. Surfaces where a tack coat is required shall be cleaned to the satisfaction of the ENGINEER before the tack coat is applied.

2.05 MINERAL FILLER:

A. Mineral filler, other than hydrated lime, shall consist of a thoroughly dry stone dust, portland cement or other mineral dust approved by the ENGINEER.

B. The mineral filler shall be free from foreign or other deleterious matter.

C. When tested by the method outlined in TxDOT Test Method Tex-200-F (Part 1 or 3), mineral filler shall meet the following gradations by weight:

Passing No. 30 Sieve	95-100%
Passing No. 80 Sieve	75%
Passing No. 200 Sieve	55%

2.06 ANTI-STRIPPING COMPOUND

A. Anti-Stripping compound, as required in the job mix formula, shall be furnished in the amounts calculated therein.

2.07 JOB MIX FORMULA:

A. A job mix formula based on representative samples, including filler if required, shall be determined submitted by the CONTRACTOR for approval of the ENGINEER.

B. The resultant job mix formula shall be within the master range for the specified type of HMAC.

C. The job mix formula for each mixture shall establish a single percentage of aggregate passing each required sieve size and a single percentage of bituminous material to be added to the aggregate and shall provide for 3 to 5% air voids in the resultant design mix. During the mix design process the following factors will be considered: air voids, Marshall stability, durability, water resistance, and asphalt film thickness.

D. After the job mix formula is established, mixtures for the project shall conform to the following tolerances which may fall outside of the specified master range:

	Percent by Weight or Volume as Applicable
Passing 1-3/4" sieve, retained on 7/8" sieve	± 5
Passing 7/8" sieve, retained on 5/8" sieve	± 5
Passing 5/8" sieve, retained on 3/8" sieve	± 5
Passing 3/8" sieve, retained on No.4 sieve	± 5
Passing No.4 sieve, retained on No.10 sieve	± 5
Total retained on No.10 sieve	± 5
Passing No.10 sieve, retained on No.40 sieve	± 3
Passing No.40 sieve, retained on No.80 sieve	± 3
Passing No.80 sieve, retained on No.200 sieve	± 3
Passing No.200 sieve	± 3
Asphaltic Material	± 0.05 by wt or 1.2 by vol.
Mixing Temperature	± 20° F

E. Asphaltic mixture shall be tested in accordance with TxDOT Test Method Tex-200-4 (Part I or Part III) and shall have the following laboratory values:

		Surface Course	Base Course
Density:	Minimum	95%	95%
	Maximum	98%	99%
	Optimum	96.5%	96.5%
Stability (Hveem)			
	Minimum	30%	30%
	Maximum	45%	45%
Stability (Marshall – 75 Blow Briquette)		1500 lbs	1500 lbs.
Voids		3 - 7%	4 - 7%
Voids Filled With Asphalt		75 - 85%	65 - 80%
Sand Equivalent		40	40

2.08 EQUIPMENT:

A. All equipment for the handling of all material, mixing, and placing of HMAC shall be in accordance with the provisions of TxDOT Item 340.

2.09 STOCKPILING, STORAGE, PROPORTIONING AND MIXING:

A. Stockpiling, storage proportioning and mixing operations shall be in accordance with the Provisions of TxDOT Item 340.

PART 3 - EXECUTION

3.01 WEATHER AND TEMPERATURE LIMITATIONS:

A. Asphaltic mixture, when placed with a spreading and finishing machine, or the tack coat shall not be placed when the air temperature is 50° F and falling, but may be placed when the air temperature is 40° F and rising.

B. Asphaltic mixture, when placed with a motor grader, shall not be placed when the air temperature is less than or equal to 60° F and falling, but may be placed when the air temperature is greater than or equal to 50° F and rising.

C. Mat thicknesses of 1 inch or less shall not be placed when the temperature on which the mat is to be laid is below 50° F.

D. No tack coat or asphaltic mixture shall be placed when the humidity, general weather conditions and temperature and moisture condition of the base, in the opinion of the ENGINEER, are unsuitable.

E. If, after being discharged from the mixer and prior to placing, the temperature of the asphaltic mixture is 50° F or more below the temperature established by the ENGINEER, all or any part of the load may be rejected and payment will not be made for the rejected material.

3.02 EQUIPMENT:

A. Hauling Equipment:

1. Trucks used for hauling asphaltic mixtures shall have tight, clean, smooth metal beds that have been thinly coated with a minimal amount of paraffin oil, lime slurry, tine solution or other approved material to prevent mixture adhesion to the bed.

2. The dispatching of hauling equipment shall be arranged so that all material delivered may be placed and all rolling completed during daylight hours, unless otherwise directed by the ENGINEER.

3. All trucks shall be equipped with a cover of canvas, or other suitable material to protect the mixture from weather or on hauls where the temperature of the mixture will fall below specified level. Use of covers will be as directed by the ENGINEER.

B. Rollers:

1. Pneumatic Tire Roller. This roller shall consist of not less than seven pneumatic tire wheels, running on axles in such manner that the rear group of tires shall cover the entire gap between adjacent tires of the forward group; mounted in a rigid frame; and provided with a loading platform or body suitable for ballast loading. The front axle shall be attached to the frame in such manner that the roller may be turned within a minimum circle. The tire shall provide surface contact pressures up to 90 pounds per square inch or more. The roller shall be so constructed as to operate in both a forward and a reverse direction with suitable provisions for moistening the surface of the tires while operating; and shall be approved by the ENGINEER. It shall be operated in accordance with the manufacturer's recommendations.

2. Two Axle Tandem Roller. This roller shall be an acceptable power-driven, steel-wheel, tandem roller weighing not less than eight tons. It must operate in forward and reverse directions; contain provision for moistening the surface of the wheels while in motion; and shall be approved by the ENGINEER. It shall be operated in accordance with the manufacturer's recommendations.

3. Three Wheel Roller. This roller shall be an acceptable power- driven, all steel, three wheel roller weighing not less than 10 tons. It must operate in forward and reverse directions; contain provisions for moistening the surface of the wheel while in motion; and shall be approved by the ENGINEER. It shall be operated in accordance with the manufacturer's recommendations.

4. Vibratory Steel Wheel Roller. If approved for use by the OWNER, this roller shall have a minimum weight of six tons. The compactor shall be equipped with amplitude and frequency controls and shall be specifically designed to compact the material on which it is used. It shall be operated in accordance with the manufacturer's recommendations.

C. Straight Edges:

1. The CONTRACTOR shall provide an acceptable 16-foot straight-edge for surface testing. Satisfactory templates shall be provided as required by the ENGINEER.

D. Spreading and Finishing Machine:

1. Bituminous pavers shall be self-contained, power-propelled units, provided with an activated screed or a strike-off assembly, heated if necessary, and capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical section and thickness shown on the plans.

2. The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed. Design will be such that no part of the truck weight will be supported by the paver.

3. The screed or strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture.

When laying mixtures, the paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture. The screed shall be adjustable for both height and crown and shall be equipped with a controlled heating device.

4. The bituminous paver shall be equipped with an automatic leveling device controlled from an external guide. The initial pass for each course shall be made using a paver equipped with a 40-foot minimum external reference, except that these requirements will not apply when asphalt concrete is placed adjacent to portland cement concrete pavement. Subsequent passes may utilize the matching device of one foot minimum length riding on the adjacent lay.

3.03 CONSTRUCTION METHODS:

A. Spreading and Finishing:

1. The asphalt concrete mixture shall be laid on the approved surface, spread and struck off to the grade and elevation established. It shall be spread and compacted in layers as shown on the plans or as directed by the ENGINEER. Bituminous pavers shall be used to distribute the mixture either over the entire width or over such partial width as may be practicable.

2. The ENGINEER will determine a minimum placement temperature within a range from 220° F to 300° F which will produce the required density. The established placement temperature, which is measured immediately behind the laydown machine, shall not vary more than 20° F.

3. A conventional paver or suitable equipment approved by the ENGINEER may be used to place asphalt concrete material on shoulders depressed from the traveled lanes in order to establish a uniform typical section. Approval of the equipment used will be based upon the results obtained.

4. The asphalt concrete may be dumped from the hauling vehicles directly into the paving machine or it may be dumped upon the surface being paved and subsequently loaded into the paving machine; however, no asphaltic concrete shall be dumped from the hauling vehicles at a distance greater than 250 feet in front of the paving machine. When asphaltic concrete is dumped first upon the surface being paved, the loading equipment shall be self-supporting and shall not exert any vertical load on the paving machine. Substantially all of the asphaltic concrete dumped shall be picked up and loaded into the paving machine.

5. To achieve, as far as practicable, a continuous operation, the speed of the paving machine shall be coordinated with the production of the plant. Sufficient hauling equipment shall be available to insure continuous operation.

6. The control system shall control the elevation of the screed at each end by controlling the elevation of one end directly and the other indirectly either through controlling the transverse slope or alternately when directed, by controlling the elevation of each end independently, including any screed attachment used for

widening, etc. Failure of the control system to function properly shall be cause for the suspension of the asphaltic concrete operations.

7. When dumping directly into the paving machine from trucks, care shall be taken to avoid jarring the machine or moving it out of alignment.

8. All courses of asphaltic concrete shall be placed and finished by means of self-propelled paving machines except under certain conditions or at certain locations where the ENGINEER deems the use of self-propelled, paving machines impracticable.

9. Self-propelled paving machines shall spread the asphaltic concrete without segregation or tearing within the specified tolerances, true to the line, grade, and crown indicated on the plans. Pavers shall be equipped with hoppers and augers which will place the asphaltic concrete evenly in front of adjustable screeds without segregation. Screeds shall include any strike-off device operated by tamping or vibrating action which is effective without tearing, shoving or gouging the asphaltic concrete and which produces a finished surface of an even and uniform texture for the full width being paved. Screeds shall be adjustable as to height and crown and shall be equipped with a controlled heating device for use when required.

10. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the mixture shall be spread, raked, fluted and compacted with hand tools. For such areas the mixture shall be dumped, spread and screed to give the required compacted thickness.

B. Compaction:

1. Rolling with the 3-wheel and tandem roller shall start longitudinally at the sides and proceed toward the center of the surface course, overlapping on successive trips by at least half the width of the rear wheels.

2. Alternate trips of the roller shall be slightly different in length.

3. Rolling with a pneumatic tired roller shall be as directed by the ENGINEER.

4. Rolling shall continue with no further compression can be obtained and all roller marks are eliminated.

5. The motion of the roller shall be slow enough at all times to avoid displacement of asphaltic materials. If displacement occurs, it shall be corrected immediately by use of rakes and fresh asphaltic mixtures, where required.

6. The roller shall not be allowed to stand on the surface course when it has not been fully compacted and allowed to cool.

7. To prevent adhesion of the surface course to the roller, the wheels shall be kept thoroughly moistened with water; however, excess water shall not be allowed.

8. All precautions shall be taken to prevent dripping of gasoline, oil, grease, or other foreign substances on the surface or base courses during rolling operations or while rollers are standing.

9. With the approval of the ENGINEER, a vibratory steel wheeled roller may be substituted for the 3-wheel roller and tandem roller.

10. Along forms, curbs, headers, walls and other places not accessible to the rollers, the mixture shall be thoroughly compacted with hot hand tampers, smoothing irons, or with mechanical tampers. On depressed areas, a trench roller may be used or cleated compression strips may be used under the roller to transmit compression to the depressed area.

11. Any mixture that becomes loose, broken, mixed with dirt, segregated, or is in any way defective shall be removed and replaced with fresh hot bituminous mixture, which shall be compacted to conform with the surrounding area. Any area showing excess or deficiency of bituminous material shall be corrected immediately as directed by the ENGINEER.

C. In-Place Density:

1. In-place density shall be required for all mixtures except thin irregular depth leveling courses.

2. Each course, after final compaction, shall have a density of not less than 95 percent of the density developed in the laboratory test method outlined in TxDOT Bulletin C-14.

3. Density shall be determined with a portable nuclear test device in conformity with ASTM D-2950.76.

4. Calibration of the portable nuclear device will be established by the ENGINEER from cut pavement samples tested in accordance with AASHTO T-166 (weight, volume method). The density readings of the cut pavement samples determined in accordance with AASHTO T-166 (weight, volume method), and the density readings of the pavement samples determined by the portable nuclear test device in conformity with ASTM D 2950 will be correlated by the ENGINEER.

5. Other methods of determining in-place density may be used as deemed necessary by the ENGINEER.

6. It is intended that acceptance density testing will be done while the bituminous mixture is hot enough to permit further compaction if necessary. If the density of an acceptance section does not meet the specified requirements, the CONTRACTOR shall continue the compaction effort until the optimum density is obtained. Rolling for any compactive effort will not be allowed when the temperature of the mix is below 175° F unless authorized in writing by the ENGINEER. Rerolling the paved surface after it has initially cooled will not be allowed.

7. If in-place density tests of the mixture produce a value lower than specified and in the opinion of the ENGINEER is not due to a change in the quality of the material,

production may proceed with subsequent changes in the mix and/or construction procedures until in-place density equals or exceeds the specified density.

8. In-place density tests will be provided by the ENGINEER unless otherwise specified.

D. Joints:

1. Placing of the asphalt concrete shall be as continuous as possible. Rollers shall not pass over the unprotected end of a freshly laid mixture unless authorized by the ENGINEER.

2. When plant mix bituminous pavement is placed over plant mix bituminous treated base or when plant mixed seal coat is placed over plant mix bituminous pavement, longitudinal joints shall be staggered at least 6 inches with relation to the longitudinal joints of the underlying course.

3. Transverse joints shall have a two foot or 12:1 minimum taper. Longitudinal joints shall have a one foot or 6:1 minimum taper. All transverse tapers shall be cut and squared off prior to commencing new work. Tapered longitudinal joints from previous operations shall be cleaned and tack coated if directed by the ENGINEER. All joints shall be completely bonded. The surface of each course at all joints shall be smooth and shall not show any deviations in excess of 3/16 of an inch when tested with a 10-foot straightedge in any direction.

4. When paving under traffic, the CONTRACTOR shall plan his daily surfacing operations on a schedule which will result in not more than one (1) day's operation of exposed longitudinal joints. The longitudinal joints shall not have a height greater than two (2) inches and shall not be left exposed longer than 24 hours.

E. Surface Tolerance:

1. Upon completion, the pavement shall be true to grade and cross section.
Except at intersections or any changes of grade, when a 16 foot straight edge is laid on the finished surface parallel to the centerline of the roadway, the surface shall not vary from the edge of the straight edge more than 1/16-inch per foot. Areas that are not within this tolerance shall be brought to grade immediately following the initial rolling. After the completion of final rolling, the smoothness of the course shall be checked, and the irregularities that exceed the specified tolerances or that retain any water on the surface shall be corrected by removing the defective work and replacing with new material as directed by the ENGINEER at the expense of the CONTRACTOR.

F. Manholes and Valve Covers:

1. Manhole frames and valve covers shall be adjusted prior to placing the surface course.

G. Compacted Thickness of HMAC Surface and Base Courses:

1. Surface Courses. The compacted thickness or depth of the asphaltic concrete surface course shall be as shown on the plans. Where the plans require a depth or thickness of the surface course greater than two inches compacted depth, same shall be placed in multiple courses of equal depth, each of which shall not exceed two inches compacted depth. If, in the opinion of the ENGINEER, an additional tack coat is considered necessary between any of the multiple courses, it shall be applied at the rate as directed.

2. Base Courses. The compacted thickness or depth of each base course shall be as shown on the plans. Where the plans require a depth or thickness of the course greater than 4 inches, same shall be accomplished by constructing multiple lifts of approximately equal depth, each of which shall not exceed these maximum compacted depths. If, in the opinion of the ENGINEER, an additional tack coat is considered necessary between any of the multiple lifts, it shall be applied as hereinbefore specified and at the rate as directed.

H. Pavement Thickness Tests:

1. Pavement Thickness Test. Upon completion of the work and before final acceptance and final payment shall be made, pavement thickness test shall be made by the ENGINEER or his authorized representative unless otherwise specified in the special provisions or in the plans. The number and location of tests shall be at the discretion of the OWNER. The cost for the initial pavement thickness test shall be at the expense of the ENGINEER. In the event a deficiency in the thickness of pavement is revealed during normal testing operations, subsequent tests necessary to isolate the deficiency shall be at the CONTRACTOR's expense.

I. Price Adjustment for Roadway Density

1. The payment of the unit price will be adjusted for roadway density as outlined in the following table. The adjustment will be applied on a lot by lot basis for each lift. The adjustment will be based on the average of five density tests. The price adjustment will be applied to the entire asphalt concrete mix which includes the HMAC aggregate, the asphalt cement and anti-stripping compound, if used.

Average Density % of Lab Density	Percent of Contract Price to Be Paid
Above 95%	100%
94.0 to 94.99	96%
93.0 to 93.99	91%
92.0 to 92.99	85%
Less than 92.00	*

* This lot shall be removed and replaced to meet specification requirements as ordered by the ENGINEER. In lieu thereof, the CONTRACTOR and the ENGINEER may agree in writing that for practical purposes, the lot shall not be removed and will be paid for at 50% of the contract price.

PART 4 - MEASUREMENT AND PAYMENT

4.01 INCIDENTAL WORK:

A. Prime coat, anti-stripping compound, where used, and tack coat shall not be measured for direct payment, but shall be considered as subsidiary work pertaining to the placing of asphaltic mixtures of the contract price.

4.02 MEASUREMENT:

A. Hot-mix asphalt concrete material shall be measured by the ton of 2,000 pounds or by the square yard of the type or types used in the completed and accepted work, as shown on the Bid Proposal.

B. Weight shall be determined by a certified scale approved by the OWNER and recorded serially numbered weight tickets, identifying the vehicle and presented to the ENGINEER's representative on the job.

4.03 PAYMENT:

A. Work performed and materials furnished, as prescribed by this item, measured as provided herein, shall be paid at the unit bid price per ton or square yard for the type or types of hot mix asphalt concrete pavement shown on the proposal.

B. Unit bid price shall be payment in full for quarrying; furnishing all materials; for all heating; mixing; hauling; cleaning existing base course or pavement; placing asphaltic mixtures; rolling and finishing; and for all labor, tools, equipment and incidentals necessary to complete the work, including the work and materials involved in the application of prime coat and tack coat.

END OF SECTION

SECTION 02617

ASPHALT SURFACE TREATMENT

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. This item shall consist of a wearing surface composed of an application of asphaltic material, covered with aggregate, constructed on existing pavements or the prepared base course surface in accordance with these specifications. This item shall apply to a single or multiple course asphalt surface treatment, otherwise known as a seal coat.

PART 2 - PRODUCTS

2.01 BITUMINOUS MATERIALS:

A. The bituminous material used for seal coating shall either be the type and grade of oil asphalt stated on the plans or emulsified asphalt EA - CRS - 2H, or as directed by the ENGINEER.

B. Oil Asphalt:

1. Oil asphalt shall be homogeneous, free from water, shall not foam when treated to 347° F and shall meet the requirements shown in Table 2617-1.

2. Any material specified may be rejected for failure to meet any of the provisions noted or for any defect causing it to be unsuitable for use.

C. Emulsified Asphalt:

1. Emulsified asphalt shall be composed of a paving asphalt base uniformly emulsified with water.

2. It shall be homogeneous throughout and, when stored, shall show no separation within 30 days after delivery.

3. Emulsified asphalt shall meet the requirements shown in Table 2617—2.

4. Emulsified asphalt may be reheated, but at no time after loading for transportation from the refinery shall the temperature of the emulsion be raised above 160° F. During reheating, the emulsion shall be agitated to prevent localized overheating.

TABLE 2617 - 1

REQUIREMENTS FOR OIL ASPHALT*

TYPE - GRADE	OA-30		OA-175**		OA-400	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Penetration at 32° F (0° C) 200g., 60 sec.	15	-	-	-	-	-
Penetration at 77° F (25° C) 100g., 5 sec.	25	35	150	200	-	-
Penetration at 115° F, 50g., 5 sec.	-	65	-	-	-	-
Ductility at 77° F (25°C) 5 cm/mm., cms: Original	2	-	70	-	-	-
Flash Point C.O.C., °F (°C)	450 (230)	-	425 (220)	-	425 (220)	-
Softening point, R.& B., °F (°C)	185 (85)	-	95 (35)	130 (35)	-	-
Thin Film Oven Test, 1/8in. Film, 50 g., 5 hours, 325° F (16° C)	-	0.4	-	1.4	-	2.0
Penetration of Residue, at 77° F (25° C), 100 g., 5 sec. % of Original Pen.	-	-	40	-	-	-
Ductility of Residue at 77° F (25° C), 5 cm/min.,cms	-	-	100	-	-	-
Solubility in Trichioroethylene, %	99.0	-	99.0	-	99.0	-
Spot Test on Original OA	Neg.		Neg.		Neg.	
Float Test at 122° F (50° C), sec.	-	-	-	-	120	150
Tests on 85 to 115 Pen. Residue*** Residue by Wt., %	-	-	-	-	75	-
Ductility, 77° F (25° C), 5 cm/min. Original Res., cms	-	-	-	-	100	-
Subjected to Thin Film Test, cm	-	-	-	-	100	-

* Or as directed by the Engineer.
** For use with latex additive only.
*** Determjned by vacuum distillation (by evaporation if unable to reduce by vacuum).

TABLE 2617-2

REQUIREMENTS FOR CATIONIC EMULSIFIED ASPHALT GRADES CRS-2h AND CMS-2S

GRADE	CRS-2h		CMS—2s	
	Min.	**Max.**	**Min.**	**Max.**
TESTS ON EMULSIONS:				
Viscosity, Saybolt Furol at 122° F	150	400	100	300
Settlement, 5 days, % (a)		5		5
Storage Stability Test, 1 day, % (b)		1		1
Demulsibility, 35 ml. 0.8 % sodium dioctyl sulfosuccinate, % (c)		40		
Coating Ability and Water Resistance:				
Coating, dry aggregate			Good	
Coating, after spraying			Fair	
Coating, wet aggregate			Fair	
Coating, after spraying			Fair	
Particle Charge Test	Positive		Positive	
Sieve Test, percent		0.10		0.10
Distillation:				
Oil distillate, by volume of emulsion, %		0.5		5
Residue, % by weight	65		65	
TEST ON RESIDUE FROM DISTILLATION TEST:				
Penetration, 77° F, 100g, 5 sec	80	110	300	
Ductility, 77° F, 5 cm/min., cm	80			
Solubility in Trichloroethylene, %	97.5		97.5	

(a) The test requirement for settlement may be waived when the emulsified asphalt is used in less than 5 days time; or the Project Manager may require that the settlement test be run from the time the sample is received until it is used, if the elapsed time is less than 5 days.
(b) The 24 hour (1 day) storage stability test may be used instead of the 5 day settlement test.
(c) The demulsibility test shall be made within 30 days from date of shipment.

D. Precoat Material:

1. Precoat material shall consist of the asphalt material shown on the plans or as specified by the ENGINEER.

2. Precoat material shall be in accordance with the requirements noted in Table 2617-3.

TABLE 2617 - 3

REQUIREMENTS FOR PRECOAT MATERIAL

Type	Special Precoat Material	
	Min.	**Max.**
Water, %	-	0.2
Flash, C.O.C., °F (°C)	200 (93)	-
Furol Viscosity at 140° F (60°C)	300	500
Distillation to 680°F (360°C):		
Initial Boiling Point, °F (°C)	500 (600)	-
Residue by weight, %	70	-
Penetration residue, 77° F (25°C), lOOg.,5 sec.	200	300

E. Flux Oil

1. Flux oil shall be free from foreign matter and shall be in accordance with the requirements of Table 2617-4.

TABLE 2617 - 4

REQUIREMENTS FOR FLUX OIL

Type	Flux Oil	
	Min.	**Max.**
Water, weight %	-	0.2
Furol Viscosity at 122° F (50° C)	50 (10)	100 (38)
Flash Point, C.O.C., °F (°C)	200 (93)	-
Loss on Heating, 50 g., 5 hrs. at 325° F(163° C), weight %	-	10
Asphalt content of 85 to 15 Penetration by Vacuum distillation, weight %	25	-

2.02 LATIVE ADDITIVE:

A. A latex additive consisting of an anionic emulsion of butadienestyrene low-temperature copolymer shall be added to OA-175 asphalt as shown on the plans or as directed by the ENGINEER.

B. The latex additive shall consist of two percent by weight, latex additive (solid basis), stabilized with fatty-acid soap for storage stability.

C. Latex additive shall posses the properties shown in Table 2617-5.

TABLE 2617 - 5

PROPERTIES FOR LATEX ADDITIVES

Monomer ratio, B/S	70/30
Minimum solids content	67%
Solids content per gal. @ 67%	5.3 lbs.
Coagulum on 80-mesh screen	0.1% max.
Type Anti-oxidant	staining
Mooney viscosity of polymer (M/L 4 @ 212°F (100°C))	100 min.
ph of latex	9.4 - 10.5
Surface tension	28 - 42 dynes/cm^2
BrooKfield viscosity of latex	1200 ps max. @ 67% solids

D. The finished latex - asphalt blend shall meet the viscosity and ductility requirements shown in Table 2617-6.

TABLE 2617 - 6

REQUIREMENTS FOR LATEX ADDITIVES

Viscosity at 140° F (60° C), stokes	1500 max.
Ductility at 39.2° F (4° C), 1 cm/min., cm	100 min.

2.03 AGGREGATES FOR BITUMINOUS TREATMENTS - CLASS I:

A. Aggregates shall be composed of clean, tough and durable particles of gravel, crushed gravel, crushed stone, crushed slag or natural limestone rock asphalt. When specified on the plans, other aggregate types may be permitted or required. These materials shall not contain more than 5 percent by weight of soft particles and other deleterious material as determined by Test Method Tex-217-F, Part I.

B. The natural limestone rock asphalt aggregate, when furnished, shall have an average bitumen content from 4 to 8 percent by weight of naturally impregnated asphalt, as determined by Test Method Tex-215-F, and shall contain not more than 2 percent by weight of any one of or combination of iron pyrites, or other objectionable matter, as determined by Test Method Tex-217-F Part I.

C. No aggregate shall contain as a total of more than 5 percent by weight of impurities or objectionable matter listed above.

D. The percent of wear, as determined by Test Method Tex-410-A, for each of the materials shall not exceed 35 percent.

E. The percent of wear on natural limestone rock asphalt aggregate as determined by Test Method Tex-410-A shall be made on that portion of the material retained on the No. 4 sieve, having a naturally impregnated asphalt content of less than 1 percent.

F. Crushed gravel shall have a minimum of 85 percent of the particles retained on the No. 4 sieve with more than one crushed face, as determined by Test Method Tex-413-A, (Particle Count).

G. Types:

1. Type A aggregate shall consist of gravel, crushed slag, crushed stone or natural limestone rock asphalt.

2. Type B aggregate shall consist of crushed gravel, crushed slag, crushed stone or natural limestone rock asphalt.

3. Type C aggregate shall consist of gravel, crushed slag or crushed stone.

4. Type D aggregate shall consist of crushed gravel, crushed slag or crushed stone.

5. Type E aggregate shall consist of natural limestone rock asphalt.

6. Type F aggregate shall be as shown on the plans.

H. Grading:

1. When tested by Test Method Tex-200-F, Part I, the gradation for Class I aggregates shall be as shown in Table 2617-7.

2. Aggregate shall not contain more than 1.0 percent by weight of fine dust, clay-like particles and/or silt when tested in accordance with test method Tex-217-F, Part II.

TABLE 2617 - 7

GRADATION REQUIREMENTS FOR CLASS I AGGREGATES

SIEVE SIZE	PERCENT RETAINED BY WEIGHT						
	GRADE 1	GRADE 2	GRADE 3	GRADE 4	GRADE 5	GRADE 6	GRADE 7*
1”	0	0	0	0	0	0	0
⅞”	0-2	0	0	0	0	0	0
¾”	20-35	0-2	0	0	0	0	0
⅝”	85-100	20-40	0-2	0	0	0	0
½”	NA	80-100	20-40	0-2	0	0-2	0
⅜	95-100	95-100	80-100	20-35	0-5	5-25	0
¼”	NA	NA	95-100	NA	NA	NA	0
No.4	NA	NA	NA	95-100	40-85	85-100	0
No. 10	99-100	99-100	99-100	99-100	98-100	98-100	0-10
No. 20	100	100	100	100	99-100	100	10-70
No. 200	100	100	100	100	100	100	95-100

* Sand Seal

2.04 AGGREGATES FOR BITUMINOUS TREATMENTS - CLASS II (LIGHTWEIGHT):

A. Aggregates shall be composed of lightweight aggregate defined as aggregate prepared by expanding, calcining, or sintering. Lightweight materials may be furnished from more than one source.

B. The dry loose unit weight of lightweight aggregate shall not be less than 35 pounds per cubic foot and shall not exceed 60 pounds per cubic foot unless specified on the plans. Furthermore, a shipment of lightweight aggregate shall be rejected if the dry loose unit weight of the shipment differs by more than 6 percent from that of the sample submitted for acceptance tests from that source. Tests shall be in accordance with Test Method Tex-404-A,

Part C, and shall be performed on a sample of similar gradation to that of the acceptance sample.

C. The percent of wear shall not exceed 35 percent when the aggregate is tested in accordance with Test Method Tex-410-A.

D. The freeze-thaw loss shall not exceed 7 percent when the aggregate is tested in accordance with Test Method Tex-432-A.

E. The pressure slaking value shall not exceed 4 percent when the aggregate is tested in accordance with Test Method Tex-431-A.

F. Grading:

1. When tested by test method Tex-200-F, Part I, the gradation for Class II aggregates shall be as shown in Table 2617—8.

2. Aggregate shall not contain more than 1.0 percent of fine dust, claylike particles and/or silt when tested in accordance with test method Tex-217-F, Part II.

TABLE 2617 – 8

GRADATION REQUIREMENTS FOR CLASS II AGGREGATES

SIEVE SIZE	PERCENTAGE RETAINED BY WEIGHT		
	GRADE 3	GRADE 4	GRADE 5
1”	0	0	0
⅞”	0	0	0
¾”	0	0	0
⅝”	0-2	0	0
½”	10-25	0-5	0
⅜”	60-80	20-40	0-2
¼”	95-100	NA	NA
No. 4	NA	95-100	60-80
No. 10	98-100	98-100	98-100
No. 20	100	100	100
No. 200	100	100	100

2.05 AGGREGATES FOR BITUMINOUS TREATMENTS - CLASS III (PRECOATED)

A. Aggregates shall be composed of clean, tough and durable particles of gravel, crushed gravel, crushed stone, crushed slag or natural limestone rock asphalt. When specified on the plans, other aggregate types may be permitted or required. These materials shall not contain more than 5 percent by weight of soft particles and other deleterious material as determined by Test Method Tex-217-F, Part I.

B. The natural limestone rock asphalt aggregate, when furnished, shall have an average bitumen content from 4 to 8 percent by weight of naturally impregnated asphalt, as determined by Test Method Tex-215-F, and shall contain not more than 2 percent by weight of any one of or combination of iron pyrites or other objectionable matter, as determined by Test Method Tex-217-F, Part I.

C. No aggregate shall contain a total of more than 5 percent by weight of impurities or objectionable matter listed above.

D. The percent of wear, as determined by Test Method Tex-410-A, for each of the materials shall not exceed 35 percent.

E. The percent of wear on natural limestone rock aggregate, as determined by Test Method Tex-410-A, shall be made on that portion of the material retained on the No. 4 sieve, having a naturally impregnated asphalt content of less than 1 percent.

F. Crushed gravel shall have a minimum of 85 percent of the particles retained on the No. 4 sieve with more than one crushed face, as determined by Test Method Tex-413-A (Particle Count).

G. Types:

1. Type PA shall be precoated aggregate consisting of gravel, crushed slag, crushed stone or natural limestone rock asphalt.

2. Type PB shall be precoated aggregate consisting of crushed gravel, crushed slag, crushed stone of limestone rock asphalt.

3. Type PC shall be precoated aggregate consisting of gravel, crushed slag or crushed stone.

4. Type PD shall be precoated aggregate consisting of crushed gravel, crushed slag or crushed stone.

5. Type PE shall be precoated aggregate consisting of natural limestone rock asphalt.

6. Type PF shall be precoated aggregate as shown on the plans.

H. Grades

1. When tested by Test Method Tex-200-F, Part I, the gradation for Class III aggregates shall be as shown in Table 2617-9

2. Aggregate shall not contain more 1.0 percent by weight of fine dust, claylike particles and/or silt when tested in accordance with Test Method Tex-217-F, Part II.

TABLE 2617 – 9

GRADATION REQUIREMENTS FOR CLASS III AGGREGATES

SIEVE SIZE	PERCENT RETAINED BY WEIGHT					
	GRADE 1	GRADE 2	GRADE 3	GRADE 4	GRADE 5	GRADE 6
1”	0	0	0	0	0	0
⅞”	0-2	0	0	0	0	0
¾”	20-35	0-2	0	0	0	0
⅝”	85-100	20-35	0-2	0	0	0
½”	NA	85-100	20-35	0-2	0	0-2
⅜”	95-100	95-100	85-100	20-35	0-5	5-25
¼”	NA	NA	95-100	NA	NA	NA
1No. 4	NA	NA	NA	95-100	40-85	85-100
No. 10	99-100	99-100	99-100	99-100	98-100	98-100
No. 20	NA	NA	NA	NA	99-100	NA
No. 200	NA	NA	NA	NA	NA	NA

I. Aggregate Precoating

1. Precoated aggregates shall be aggregates of the type specified, treated (coated or fluxed) with 0.5 to 2.0 percent by weight of precoat material or fluxing material meeting the requirements of this specification. The grade of aggregate specified shall meet all requirements of this section prior to the application of the precoat material or fluxing material.

J. Equipment

1. Equipment for precoating aggregates shall comply with the provisions of SDHPT Item 304,

paragraph 304.6.

PART 3 - EXECUTION

3.01 WEATHER LIMITATIONS

A. A single course surface treatment shall not be applied when the air temperature is below 60^{o} F and falling, but may be applied when the air temperature is above 50^{o} F and rising. The air temperature shall be taken in the shade and away from artificial heat. No asphaltic material shall be placed when the temperature of the roadway surface is below 60^{o} F, or when the general weather conditions, in the opinion of the ENGINEER, are not suitable.

3.02 EQUIPMENT

A. All equipment shall be of a type approved by the ENGINEER. The ENGINEER may require the CONTRACTOR to remove or replace any equipment used in placing surface treatment materials that proves to be unsatisfactory.

B. DISTRIBUTOR: The distributor shall be a self-propelled pressure type, equipped with an asphaltic material heater and a distributing pump capable of pumping the material at the specified rate through the distributor spray bar. The distributor spray bar shall be capable of fully circulating the asphaltic material. The distributor spray bar shall contain nipples and valves so constructed that the nipples will not become partially plugged with congealing asphaltic material, in order to prevent streaking or irregular distribution of asphaltic material. Distributor equipment shall include a tachometer, pressure gauges, volume measuring devices, and thermometer for reading the temperature of tank contents. A deflector plate shall be used at each end of the spray bar to provide a clean edge and minimize overlapping.

The distributor tank shall have been calibrated within three (3) years from the date it is first used on this project. The tank calibration procedure shall be in accordance with Test Method Tex-922-K, Part 1, and shall be signed and sealed by a registered professional engineer. Unless otherwise shown on the plans, the CONTRACTOR shall provide the tank calibration and shall furnish the ENGINEER an accurate and satisfactory calibration record prior to beginning the work. The ENGINEER may at any time verify calibration accuracy in accordance with Test Method Tex-922-K, Part II, and may perform the recalibration if the calibration is found to be in error.

B. AGGREGATE SPREADER: A self-propelled continuous-feed aggregate spreader shall be used which will uniformly spread aggregate at the rate specified by the ENGINEER.

C. ROLLERS: Approved rolling equipment shall be of the self-propelled type and shall be so designed such that a 12 ton load may be obtained by ballast loading. The roller shall be equipped with tires that will afford ground contact pressures to 90 psi or more. Individual tire inflation pressures shall be within 5 psi of each other. The operation load and tire air pressure shall be within the range of the manufacture's chart. Flat Wheel Rollers shall conform to Section 2780. Pneumatic Tire Rollers shall conform to Section 2782.

D. SWEEPERS: A rotary, self-propelled power broom shall be acceptable for sweeping existing pavement surfaces.

Vacuum sweepers or other approved equally capable equipment shall be suitable for removing loose aggregate form the compacted Seal Coat.

E. OTHER: All storage tanks, piping retorts, booster tanks and distributors used in storage or handling asphaltic materials shall be kept clean and in good operation condition at all times. They shall be operated in such manner that there will be no contamination of the asphaltic material. Provide and maintain in good working order, a recording thermometer at the storage-heating unit at all times.

3.03 SURFACE PREPARATION

A. Surface treatment operations shall not be started until the surface to be treated has been thoroughly cleared of any vegetation and compacted by approved rolling.

B. Immediately prior to applying bituminous material, the surface to be treated shall be thoroughly cleaned of all dirt and loose material by sweeping with power brooms, hand brooms, compressed air, or other approved methods. All existing raised marking shall be removed daily, as the work progresses, and as approved by the ENGINEER. All vegetation found in the existing pavement shall be destroyed by use of an approved chemical.

C. Unstable corrugated areas shall be removed and replaced with unstable patching materials. Payment for the patching materials will be made at the contract unit price for the various items used unless a reconditioning item is included in the contract.

D. Building paper shall be placed over all manholes, valve boxes, grates, etc., so as to protect the surfaces from asphaltic materials.

3.04 PRIME COAT

A. Prime coat, when required, shall be applied to the surface to be treated in accordance with Section 2610.

B. Surface treatment shall not be applied until prime coat has adequately cured as determined by the ENGINEER.

3.05 APPLICATION OF BITUMINOUS MATERIAL

A. Bituminous material shall be applied by means of a pressure distributor in a uniform speed over the section to be treated and within a temperature range approved by the ENGINEER. In areas where the use if a distributor is not practical, the material shall be applied by hand or by other methods approved by the ENGINEER. Areas that are deficient or excessive in the uniform required amount

of bituminous material shall be corrected.

B. The ENGINEER will select the temperature of application based on the temperature-viscosity relationship that will permit application of the asphalt within the limits recommended in the Item, "Asphalts, Oils, and Emulsions" of the Texas Department of Transportation Standard Specifications". The CONTRACTOR shall apply the asphalt at a temperature within 15^{o} F of the temperature selected. The CONTRACTOR shall provide reliable and accurate means for determining asphalt temperature and shall assure that the aggregate distributor is properly calibrated to spread the specified application rate uniformly.

C. The width of each application of asphaltic material shall be such to allow uniform application and immediate covering with aggregate. The contractor shall be responsible for uniform application of asphaltic material at the junction of distributor loads. Paper or other suitable material shall be used to prevent overlapping of transverse joints. Longitudinal joints shall match lane lines unless otherwise authorized by the ENGINEER. The application of asphaltic material will be measured as necessary to determine the rate of application.

D. Aggregate shall be immediately and uniformly applied and spread in the same width as the application of asphaltic material. The entire surface shall then be broomed or raked as required by the ENGINEER.

E. The aggregate shall be rolled for its width with a minimum of two (2) pneumatic tires rollers which shall be maintained in good repair and operating condition. Rolling shall begin as soon as sufficient aggregate is spread to prevent pick-up and shall begin longitudinally at the outside edge of the mat and progress toward the center of the mat, uniformly lapping each preceding pass by at least 2 widths of the roller. Rolling shall continue until no more aggregate can be worked into the surface.

F. After all rolling, the finished surface shall be cleared of any surplus aggregate by the CONTRACTOR by sweeping or raking, as required by the ENGINEER. Until the work has been accepted, additional sweeping shall be required as often as necessary so that loose aggregate does not present a hazard to traffic.

G. The bituminous distributor, when not spreading, shall be parked so that the spray bar or mechanism does not drop bituminous material on the surface of the traveled way.

H. The CONTRACTOR shall be responsible for the maintenance of the Seal Coat until the work is accepted by the ENGINEER. All holes or failures in the surface shall be repaired by use of additional asphalt and aggregate. All fat or bleeding surfaces shall be covered with approved cover material in such a manner that the asphaltic material will not adhere to or be picked up by the wheels of vehicles.

I. Surplus materials (including roadway, gutter, sidewalks, etc.) shall be removed and disposed of off the project site by CONTRACTOR

J. All parkways, private property, and driveways adjacent to the work shall be cleaned of loose

aggregate and other debris as produced from Seal Coat operations.

K. Protect and adjust existing water valve, water meters, and manhole covers so that they remain visible and serviceable. Unless listed as a separate bid item, these items shall be considered incidental to the work herein specified.

L. Pavement buttons and fire hydrant markers must be protected from asphalt oil during sealing operation. After sealing operation, buttons must again be visible. Method for capping buttons is to be approved by ENGINEER. Unless listed as a separate bid item, these items shall be considered incidental to the work herein specified.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Asphalt Surface Treatment will be measured by the square yard (SY) of surface area of completed roadway, for the specified number of courses. Measurement will be from edge to edge of curb and gutter or edge of completed application.

4.02 PAYMENT

A. Asphalt Surface Treatment will be measured as set forth above and paid for per square yard (SY) complete in place, which shall be full compensation for furnishing all materials, equipment, labor, tools, and incidentals necessary.

END OF SECTION

SECTION 02620

CONCRETE CURB AND GUTTER

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. This work shall consist of the construction of concrete curb, concrete curb and gutter, concrete gutter or valley gutter, or combination thereof in compliance with the specifications, lines, grades, and details shown on the plans, or as directed by the ENGINEER.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Concrete and manufactured curb and gutter materials shall be subject to inspection and tests at plants and construction sites for compliance with quality requirements.

B. Concrete curb and gutter or concrete valley gutter shall be constructed with concrete conforming to the provisions of Section 02614 - Portland Cement Concrete Paving, or Class "B" concrete conforming to the requirements of Section 03300 - Cast-In-Place Concrete.

C. Preformed expansion Joint Filler shall conform to the requirements of AASHTO M-33 or M-153.

D. Linseed Oil shall conform to the requirements of AASHTO D-260.

E. Mineral Spirits shall conform to the requirements of AASHTO D-235.

2.02 FOUNDATION:

A. Concrete curb and gutter or concrete valley gutter shall be placed on an approved foundation conforming to the requirements of the following City of McAllen Specifications:

1. Section 02210 - Subgrade Preparation,

2. Section 02260 - Flexible Base,

3. Section 02230 - Roadway Excavation, Borrow, and Embankment.

PART 3 - EXECUTION

3.01 EXCAVATION:

A. When required, excavation shall be made to the specified depth, and the base upon which the curb and gutter or valley gutter is to be placed shall be compacted to a firm, even surface conforming to the requirements of Subsection 2.02 above.

B. All soft and unacceptable material shall be removed and replaced with material approved by the ENGINEER in conformance with the requirements of Subsection 2.02 above.

3.02 FORMS:

A. Forms shall be of wood or metal, straight, free from warp, and of such construction that facilitates the inspection of the grade and alignment for compliance with the approved plans and specifications.

B. All forms shall extend for the entire depth of the curb and gutter and shall be braced and secured sufficiently so that no deflection from alignment or grade will occur during the placement of the concrete. Flexible forms shall be used in curved sections so that the top surface of the forms will form a smooth, continuous arc.

3.03 MIXING AND PLACING:

A. Concrete shall be proportioned, mixed, and placed in accordance with the requirements of Section 02630 – Concrete Pavement and Section 03300 – Cast in Place Concrete.

B. Compaction of the concrete placed in forms shall be by vibration or other acceptable methods.

C. Unless otherwise provided. After initial set, the exposed surfaces of curbs and gutters shall be finished by belting, or with steel or wooden floats then broom finish to achieve a uniform texture to the satisfaction of the Engineer. Forms shall be left in place until the concrete has set sufficiently so that they can be removed without injury to the curb and gutter.

3.04 SECTIONS:

A. Curb and gutter shall be constructed in sections having a uniform length of 20 feet, unless otherwise directed by the ENGINEER. Except at expansion joints, sections shall be separated by open joints 1/8 inch wide.

3.05 EXPANSION JOINTS:

A. Expansion joints shall be formed at the intervals shown on the plans using preformed expansion joints filler having a thickness of 3/4 inch.
B. When the curb and gutter o concrete valley gutter is constructed adjacent to an existing concrete pavement, an expansion joint shall be located between the curb and gutter section and the existing concrete pavement.

3.06 CURING

A. Immediately upon completion of the finishing, the curb and gutter shall be moistened and kept moist for 3 days, or the curb and gutter shall be cured by the use of a membrane-forming material. The method and details of curing shall be subject to the approval of the ENGINEER.

3.07 SURFACE TREATMENT:

A. The surface of concrete curb and gutter or concrete valley gutter shall be treated with a solution of Linseed Oil and Mineral Spirits in accordance with the applicable requirements of Section 03300 - Cast-In-Place Concrete.

3.08 BACKFILLING:

A. After the concrete has set sufficiently, the spaces in front and behind the curb and gutter section shall be refilled to the required elevation with material approved by the ENGINEER, and shall be thoroughly tamped in layers of not more than 6 inches.

3.09 SLIP-FORM CONCRETE CURB, CONCRETE CURB AND GUTTER OR CONCRETE VALLEY GUTTER:

A. Any concrete curb or concrete curb and gutter, except on structures, may be placed using a slip form machine provided that the finished concrete curb or concrete curb and gutter is true to line and grade, the concrete is dense, and of the required surface texture.

B. The concrete shall be of a consistency that it will maintain the shape of the concrete curb or concrete curb and gutter section without support after slip forming.

C. The top and face of the finished concrete curb or concrete curb and gutter shall be true and straight and the top surface of the concrete curb or concrete curb and gutter shall be of uniform width and free from humps, sags, or other irregularities.

D. The forming portion of the slip form machine shall be readily adjustable vertically during the forward motion of the slip form machine to provide a variable height of concrete curb or concrete curb and gutter grade when necessary. A grade line gauge or pointer shall be attached to the slip form machine in such a manner that a continual comparison can be made between the concrete curb or concrete curb and gutter grade as indicated by the offset guidelines.

E. Concrete shall be fed to the slip form machine at a uniform rate. The slip form machine shall be operated under sufficient uniform restraint to forward motion to produce a well compacted mass of concrete free from surface pits larger than 3/16 inch in diameter and requiring no further finishing, other than light brushing with a wet brush. Finishing with a brush application of grout will not be permitted.

F. Transverse weakened planes and expansion joints shall be constructed at right angles to the line of the concrete curb, concrete curb and gutter, or concrete valley gutter.

G. Expansion joints may be constructed by sawing through the concrete curb or concrete curb and gutter section to its full depth. The width of the cut shall be such as to admit the joint filler with a snug fit.

H. The operations of sawing and inserting the joint filler shall be completed before curing the concrete. At the conclusion of the curing period the filler in each joint shall be checked for tightness of fit. Loose filler in any joint shall be mortared in place and cured.

I. Excavation shall be as per Subsection 3.02 above.

J. All remaining provisions of Subsection 2.02 above also apply, unless otherwise specified.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Curb and gutter, curb, and valley gutter shall be measured by the linear foot.

1. Curb shall be measured along the front face of the section at the finished grade elevation.

2. Combination curb and gutter will be measured along the face of the curb at the flow line of the gutter.

3. Valley gutter will be measured along the flow line of the gutter.

B. A deduction in length shall be made for drainage structures, such as catch basins or inlets, in the curb, gutter, or combination thereof.

C. There will be no direct measurement or payment of materials used to construct curb and gutter, curb, or valley gutter.

D. Excavation or construction of embankment for foundation of curb, valley gutter, or combination curb and gutter will not be measured for payment.

4.02 PAYMENT:

A. The accepted quantities of curb, valley gutter, and curb and gutter will be paid for at the contract unit bid price per linear foot for each kind and type specified, complete and in place.

B. Foundation preparation by excavating or constructing embankment to the required subgrade elevation is considered incidental to the completion of the work and no direct payment will be made thereof.

C. Compensation will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

END OF SECTION

SECTION 02630

CONCRETE PAVEMENT

PART 1 - GENERAL

1.0 THE GENERAL CONDITIONS, SPECIAL PROVISIONS and applicable requirements of DIVISION 1 - GENERAL REQUIREMENTS are hereby made a part of this section.

1.1 SCOPE: This work consists of street pavement, sidewalk, curb and gutter or rip rap slope pavement composed of Portland Cement Concrete with or without reinforcement, constructed on subgrade or base courses prepared in accordance with these specifications and to the lines, grades, thicknesses and typical cross-sections shown on the plans. Reinforcement, when required, will be subsidiary to the specified Concrete Pavement.

PART 2 - PRODUCTS

2.0 PORTLAND CEMENT

Portland cement concrete shall conform to the requirements of "Section 03301 - Concrete" for each type and strength indicated in the plans.

2.1 JOINT FILLER AND SEALER:

Joint sealants and expansion joint filler materials shall conform to "Item #433, JOINT SEALANTS & FILLERS" in the 1993 edition of TxDOT Standard Specifications for Construction of Highways, Streets and Bridges.

2.2 STEEL REINFORCEMENT:

Reinforcing bars shall conform to the requirements of AASHTO M31 or M53, Grade 60. Fabricated bar mats may be used if they conform to the requirements of AASHTO M54.

2.3 DOWELS AND TIE BARS:

Dowels and tie bars shall conform to the requirements of AASHTO M31 or M53, Grade 60 or Grade 40, as specified on the plans. Tie bars shall be deformed meeting the requirements of AASHTO M31 or M53. Dowel and tie bars may conform to the requirements of AASHTO M 42, except that rail steel shall not be used for tie bars that are to be bent or restraightened during construction. Dowel bars shall be plain round bars of the size specified and the ends shall be sawed. Before delivery to the construction site, a minimum of two-thirds of the length of each dowel bar shall be painted with one coat of lead or tar paint. Prior to placement of concrete, the dowels shall be coated with grease if specified on the plans.

2.4 WATER:

Water used in mixing or curing shall be as clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product as possible. Water will be tested in accordance with the requirements of AASHTO Method T26. Water known to be of potable quality may be used without testing.

2.5 COVER MATERIALS FOR CURING:

Curing materials shall conform to one of the following specifications:

1. "Sheet Materials for Curing Concrete" shall conform to AASHTO M171.

2. "Burlap Cloth Made from Jute or Kenat" shall conform to AASHTO M182, Class

3. "Liquid Membrane - Forming Compounds for Curing Concrete" shall conform to AASHTO M148, Type 2 (all-resin base), or Federal Specification TT-C-800, Type 2. Liquid Membrane shall be delivered and stored in bulk. Bulk storage shall be equipped with an agitator. All membranes shall be pigmented to allow visible inspection of coverage.

2.6 POZZOLANIC ADMIXTURE:

The use of fly ash as a partial replacement for cement in pavement mix designs, at the rate specified in this paragraph will be allowed at the Contractor's option. Pozzolanic admixtures shall be fly ash meeting the requirements of ASTM C-618, Type C except loss on ignition shall not exceed three (3) percent. When fly ash is used as a partial replacement for cement, the minimum cement content may be met by considering portland cement plus fly ash as the total cementitious component. The replacement rate should not exceed 15 percent.

PART 3 – EXECUTION

3.1 EQUIPMENT:

Equipment and tools necessary for handling materials and performing all parts of the work shall be approved by the Engineer as to design, capacity, and mechanical condition. The equipment shall be at the job site before the start of construction operations for examination and approval.

A. Batching Plant and Equipment

1. General: The batching plant shall include bins, weighing hoppers, and scales for the fine aggregate and coarse aggregate. If bulk cement is used, a bin, hopper, and a

separate scale for cement shall be included. The weighing hoppers shall be properly sealed and vented to preclude dusting during operation.

2. Bins and Hopper. Bins with adequate separate compartments for fine aggregate and coarse aggregate shall be provided in the batching plant. Each compartment shall discharge efficiently and freely into the weighing hopper. Means of control shall be provided so that, as the quantity desired in the weighing hopper is approached, the material may be added slowly and shut off with precision. A port or other opening for removing an overload of any one of the several materials from the hopper shall be provided. Weighing hoppers shall be constructed to eliminate accumulations of materials and to discharge fully.

3. Scales. The scales for weighing aggregates and cement shall be of either the beam or the springless dial type. They shall be accurate within 0.5 percent throughout their range of use. When beam-type scales are used, provisions such as a "telltale" dial shall be made for indicating to the operator that the required load in the weighing hopper is being approached. A device on the weighing beams shall clearly indicate critical position. Poises shall be designed to be locked in any position and to prevent unauthorized change. The weight beam and "telltale" device shall be in full view of the operator while charging the hopper, and the operator shall have convenient access to all controls. Scales shall be inspected and sealed as often as the Engineer may deem necessary to assure their continued accuracy. The Contractor shall have on hand not less than ten 50-pound (23 kg) weights for testing of all scales when directed by the Engineer.

B. Mixers.

1. General. Concrete may be mixed at a central plant, or wholly or in part in truck mixers. Each mixer shall have attached in a prominent place a manufacturer's nameplate showing the capacity of the drum in terms of volume of mixed concrete and the speed of rotation of the mixing drum or blades. A device accurate within 3 percent and satisfactory to the Engineer shall be provided at the mixer for determining the amount of air-entraining agent or other admixture to be added to each batch requiring such admixtures. Mixers shall be examined daily for the accumulation of hard concrete or mortar and the wear of blades.

2. Central Plant Mixer. Mixing shall be in an approved mixer capable of combining the aggregates, cement, and water into a thoroughly mixed and uniform mass within the specified mixing period, and of discharging the mixture without segregation. Central plant mixers shall be equipped with an acceptable timing device that will not permit the batch to be discharged until the specified mixing time has elapsed. The water system for a central mixer shall be either a calibrated measuring tank or a meter and shall not necessarily be an integral part of the mixer. The mixers shall be examined daily for changes in condition due to accumulation of hard concrete or mortar or wear of blades. The pickup and throwover blades shall be replaced when they have worn down 3/4-inch (19 mm) or more. The Contractor shall have a copy

of the manufacturer's design on hand showing dimensions and arrangement of blades in reference to original height and depth.

3. Truck Mixers and Truck Agitators. Truck mixers used for mixing and hauling concrete and truck agitators used for hauling central-mixed concrete shall conform to the requirements of ASTM C94.

C. Finishing Equipment.

1. Finishing Machine. The finishing machine shall be equipped with one or more oscillating-type transverse screeds.

2. Vibrators. For side-form construction, vibrators may be either the surface pan type for pavements less than 8 inches (20 cm) thick or the internal type with either immersed tube or multiple spuds, for the full width of the concrete slab. They may be attached to the spreader or the finishing machine, or they may be mounted on a separate carriage. They shall not come in contact with the joint, load-transfer devices, subgrade, or side forms. The frequency of the surface vibrators shall not be less than 3,500 vibrations per minute, and the frequency of the internal type shall not be less than 7,000 vibrations per minute for spud vibrators. When spud-type internal vibrators are used adjacent to the side forms, they shall have a frequency of not less than 3,500 vibrations per minute. Hand vibrators should be used to consolidate the concrete along forms and other isolated areas. For slip-form construction, the paver shall vibrate the concrete for the full width and depth of the strip of pavement being placed. Vibration shall be accomplished by internal vibrators with a frequency range variable between 7,000 and 12,000 vibrations per minute. The amplitude of vibration shall be between 0.025 (0.6 mm) and 0.06 (1.5 mm) inches. The number, spacing, frequency, and eccentric weights shall be provided as necessary to achieve an acceptable concrete density and finishing quality. Adequate power to operate all vibrators at the weight and frequency required for a satisfactory finish shall be available on the paver. The internal vibrators may be supplemented by vibrating screeds operating on the surface of the concrete. The frequency of surface vibrators shall not be less than 3,500 vibrations per minute. The Contractor shall furnish a tachometer or other suitable device for measuring the frequency of the vibrators. The vibrators and tamping elements shall be automatically controlled so that they shall be stopped as forward motion ceases. Any override switch shall be of the springloaded, momentary contact type. For hand placed pavement the contractor shall consolidate concrete with the use of a hand held vibrator regardless of the type of strike off machinery used. Vibration shall be done to sufficiently remove air voids and consolidate concrete around reinforcing steel and side forms. VIBRATORS SHALL NOT BE USED TO DISTRIBUTE CONCRETE. The contractor shall limit disturbances of consolidated concrete during strike-off and finishing by using adequately sized floats and straight edges as approved by the Engineer. Vibrators, floats, and finishing tools to be on job site at all times during concrete placement.

3. Concrete Saw. When sawing of joints is specified, the Contractor shall provide sawing equipment adequate in number of units and power to complete the sawing to the required dimensions and at the required rate. The Contractor shall provide at least one standby saw in good working order. An ample supply of saw blades shall be maintained at the site of the work at all times during sawing operations. The Contractor shall provide adequate artificial lighting facilities for night sawing. All of this equipment shall be on the job both before and at all times during concrete placement.

4. Forms. Straight side forms shall be made of steel having a thickness of not less than 7/32 inch (6 mm) and shall be furnished in sections not less than 10 feet (3 m) in length. Forms shall have a depth equal to the prescribed edge thickness of the concrete without horizontal joint, and a base width equal to the depth of the forms. Flexible or curved forms of proper radius shall be used for curves of 100-foot (31 m) radius or less. Flexible or curved forms shall be of a design acceptable to the Engineer. Forms shall be provided with adequate devices for secure settings so that when in place they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Flange braces shall extend outward on the base not less than two-thirds the height of the form. Forms with battered top surfaces and bent, twisted, or broken forms shall be removed from the work. Repaired forms shall not be used until inspected and approved. Built-up forms shall not be used, except as approved by the Engineer. The top face of the form shall not vary from a true plane more than 1/8 inch (3 mm) in 10 feet (3 m), and the upstanding leg shall not vary more than 1/4-inch (6 mm). The forms shall contain provisions for locking the ends of abutting sections together tightly for secure setting.

5. Slip-form Pavers. The paver shall be fully energized, self-propelled, and designed for the specific purpose of placing, consolidating, and finishing the concrete pavement, true to grade, tolerances, and cross section. It shall be of sufficient weight and power to construct the maximum specified concrete paving lane width as shown in the plans, at adequate forward speed, without transverse, longitudinal or vertical instability or without displacement. The paver shall be equipped with electronic or hydraulic horizontal and vertical control devices.

3.2 FORM SETTING:

Forms shall be set sufficiently in advance of the concrete placement to insure continuous paving operation. After the forms have been set to correct grade, the grade shall be thoroughly tamped, either mechanically or by hand, at both the inside and outside edges of the base of the forms. Forms shall be staked into place with not less than 3 pins for each 10-foot (3 m) section. A pin shall be placed at each side of every joint. Form sections shall be tightly locked and shall be free from play or movement in any direction. The forms shall not deviate from true line by more than 1/4-inch (6 mm) at any joint. Forms shall be so set that

they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms shall be cleaned and oiled prior to the placing of concrete. The alignment and grade elevations of the forms shall be checked and corrections made by the Contractor immediately before placing the concrete. When any form has been disturbed or any grade has become unstable, the form shall be reset and rechecked.

3.3 CONDITIONING OF UNDERLYING COURSE AND REINFORCING:

The prepared grade shall be well moistened with water, without saturating, immediately ahead of concrete placement to prevent rapid loss of moisture from the concrete. Ruts or depressions in the subgrade or subbase caused by hauling or usage of other equipment shall be filled as they develop with suitable material (not with concrete or concrete aggregates) and thoroughly compacted by rolling. If damage occurs to a stabilized subbase, it shall be corrected full depth by the Contractor, or the damaged areas filled with concrete integral with the pavement. All excess material shall be removed. Low areas may be filled and compacted to a condition similar to that of the surrounding grade, or filled with concrete integral with the pavement. In cold weather, the underlying subbase shall be protected so that it will be entirely free from frost when the concrete is placed. The use of chemicals to eliminate frost in the underlying material will not be permitted. The work described under the foregoing paragraphs does not constitute a regular subgrading operation, but rather a final accurate check of the underlying course. Reinforcing steel, at the time concrete is placed, shall be free of mud, oil, or other organic matter that may adversely affect or reduce bond. Reinforcing steel with rust, mill scale, or a combination of both will be considered satisfactory, provided the minimum dimensions, weight, and tensile properties of a hand wire-brushed test specimen are not less than the applicable ASTM specification requirements and provided the rust or scale is not loose. Reinforcing bars shall be securely wired together at all intersections and splices and shall be securely wired to each dowel and load transmission unit intersected. All bars shall be installed in their required position as shown on the plans.

3.4 MIXING CONCRETE:

The concrete may be mixed at the work site, in a central mix plant or in truck mixers. The mixer shall be of an approved type and capacity. Mixing time shall be measured from the time all materials, except water, are emptied into the drum. Ready-mixed concrete shall be mixed and delivered in accordance with the requirements of ASTM C94, except that the minimum required revolutions of the mixing speed for transit mixed concrete may be reduced to not less than that recommended by the mixer manufacturer. The number of revolutions recommended by the mixer manufacturer shall be indicated on the manufacturer's serial plate attached to the mixer. When mixed at the work site or in a central mixing plant, the mixing time shall not be less than 50 seconds nor more than 90 seconds. Mixing time ends when the discharge chute opens. Transfer time in multiple drum mixers is included in mixing time. The contents of an individual mixer drum shall be removed before a succeeding batch is emptied therein. The mixer shall be operated at the drum speed as shown on the manufacturer's nameplate on the approved mixer. Any concrete mixed less

than the specified time shall be discarded at the Contractor's expense. The volume of concrete mixed per batch shall not exceed the mixer's nominal capacity in cubic feet (cubic meters), as shown on the manufacturer's standard rating plate on the mixer. An overload up to 10 percent above the mixer's nominal capacity may be permitted provided concrete test data for segregation and uniform consistency are satisfactory, and provided no spillage of concrete takes place. The batch shall be charged into the drum so that a portion of the mixing water shall enter in advance of the cement and aggregates. The flow of water shall be uniform, and all water shall be in the drum by the end of the first 15 seconds of the mixing period. The throat of the drum shall be kept free of such accumulations as may restrict the free flow of materials into the drum. Mixed concrete from the central mixing plant shall be transported in truck mixers, truck agitators, or non agitating trucks. The time elapsing from the time water is added to the mix until the concrete is deposited in place at the work site shall not exceed 30 minutes when the concrete is hauled in non agitating trucks, nor 60 minutes when the concrete is hauled in truck mixers or truck agitators. **Re-tempering concrete by adding water or by other means will not be permitted, except when concrete is delivered in transit mixers. With transit mixers additional water may be added to the batch materials and additional mixing performed to increase the slump to meet the specified requirements, if permitted by the Engineer**. All these operations must be performed within 45 minutes after the initial mixing operations and the water-cement ratio must not be exceeded. Admixtures for increasing the workability or for accelerating the set will be permitted only when specified for in the contract.

3.5 LIMITATIONS OF MIXING:

No concrete shall be mixed, placed, or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated. Unless authorized in writing by the Engineer, mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40 degrees F (4 degrees C) and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35 degrees F (2 degrees C). When concreting is authorized during cold weather, the aggregates may be heated by either steam or dry heat prior to being placed in the mixer. The apparatus used shall heat the mass uniformly and shall be arranged to preclude the possible occurrence of overheated areas which might be detrimental to the materials. Unless otherwise authorized, the temperature of the mixed concrete shall not be less than 50 degrees F (10 degrees C) at the time of placement in the forms. If the air temperature is 35 degrees F (2 degrees C) or less at the time of placing concrete, the Engineer may require the water and/or the aggregates to be heated to not less than 70 degrees F (21 degrees C) nor more than 150 degrees F (66 degrees C). Concrete shall not be placed on frozen subgrade nor shall frozen aggregates be used in the concrete. During periods of warm weather when the maximum daily air temperature exceeds 85 degrees F (30 degrees C), the following precautions should be taken. The forms and/or the underlying material shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable, and in no case shall the temperature of the concrete when placed exceed 90 degrees F (32 degrees C). The aggregate and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum.

3.6 PLACING CONCRETE:

A. Side-form Method: For the side-form method, the concrete shall be deposited on the moistened grade to require as little rehandling as possible. Unless truck mixers, truck agitators, or nonagitating hauling equipment are equipped with means for discharge of concrete without segregation of the materials, the concrete shall be unloaded into an approved spreading device and mechanically spread on the grade to prevent segregation of the materials. Placing shall be continuous between transverse joints without the use of intermediate bulkheads. Necessary hand spreading shall be done with shovels -- **NOT RAKES**. Workmen shall not be allowed to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances. Concrete for side-form construction shall be placed on cement treated base. No concrete shall be placed before the cement treated base has obtained a compressive strength specified at 7 days. When concrete is to be placed adjoining a previously constructed lane of pavement and when mechanical equipment will be operated upon the existing lane of pavement, the concrete shall be at least 7 days old and at a flexural strength approved by the Engineer. If only finishing equipment is carried on the existing lane, paving in adjoining lanes may be permitted after 3 days, if approved by the Engineer. Concrete shall be thoroughly consolidated against and along the faces of all forms and along the full length and on both sides of all joint assemblies by means of vibrators inserted in the concrete. Vibrators shall not be permitted to come in contact with a joint assembly, the grade, or a side form. In no case shall the vibrator be operated longer than 15 seconds in any one location, nor shall the vibrators be used to move the concrete. Concrete shall be deposited as near to expansion and contraction joints as possible without disturbing them but shall not be dumped from the discharge bucket or hopper onto a joint assembly unless the hopper is well centered on the joint assembly. Should any concrete materials fall on or be worked into the surface of a completed slab, they shall be removed immediately by approved methods.

B. Slip Form Method. For the slip-form method, the concrete shall be placed with an approved crawler-mounted, slip-form paver designed to spread, consolidate, and shape the freshly placed concrete in one complete pass of the machine so that a minimum of hand finishing will be necessary to provide a dense and homogeneous pavement in conformance with requirements of the plans and specifications. The concrete should be placed directly on top of the joint assemblies to prevent them from moving when the paver moves over them. Side forms and finishing screeds shall be adjustable to the extent required to produce the specified pavement edge and surface tolerance. The side forms shall be of dimensions, shape, and strength to support the concrete laterally for a sufficient length of time so that no appreciable edge slumping will occur. Final finishing shall be accomplished while the concrete is still in the plastic state. Concrete for slip form construction shall be placed on cement treated base or lime stabilized subgrade. No concrete shall be placed before the cement treated base has obtained the compressive

strength specified at 7 days. The Contractor shall set grade stakes and stringline for each lane placement. The stringline shall be supported at intervals of not more than 25 feet. Additional supports shall be installed to prevent sag of the stringline. The horizontal alignment of the stringline shall be within plus or minus 1/4-inch in 10 feet of true alignment. The Contractor shall provide a suitable method of securing the stringline to maintain proper grade where vertical curves are to be constructed.

C. Hand Placement Method. When the hand method of striking off and consolidating is permitted, the concrete, as soon as placed, shall be approximately leveled and then struck off and screeded to such elevation above grade that, when consolidated and finished, the surface of the pavement shall be at the grade elevation shown on the plans. The entire surface shall then be tamped and the concrete consolidated so as to insure maximum compaction and a minimum of voids. For the strike off and consolidation, both a strike template and tamping template shall be provided on the work. In operation the strike template shall be moved forward with a combined longitudinal and transverse motion and so manipulated that neither end of the template is raised from the forms during the striking-off process. A slight excess of material shall be kept in front of the cutting edge at all times. The straightedging, surfacing and joint finishing shall be as described herein.

3.7 STRIKE-OFF OF CONCRETE:

Following the placing of the concrete, it shall be struck off to conform to the cross section shown on the plans and to an elevation such that when the concrete is properly consolidated and finished, the surface of the pavement shall be at the elevation shown on the plans. All reinforcement shall be positioned in advance of concrete placement. All reinforcing bars and bar mats shall be installed in the slab at the required depth below the finished surface and supported by chairs installed on 4-foot centers. After the reinforcing steel is securely installed above the subgrade, as specifically required by plans and as herein prescribed, there shall be no loading imposed upon (or walking upon) the bar mats or individual bars that will cause deformation of reinforcing before or during the placing or finishing of the concrete.

3.8 JOINTS.

A. General:

1. Longitudinal and Transverse Joints. Longitudinal and transverse joints shall be constructed as indicated on the plans and in accordance with these requirements. All joints shall be constructed true to line with their faces perpendicular to the surface of the pavement. Joints shall not vary more than 1/2-inch (13 mm) from a true line or from their designated position. The vertical surface of the pavement adjacent to all expansion joints shall be finished to a true plane and edged to a radius of 1/4-inch (6 mm) or as shown on the plans. The surface across the joints shall be tested with a 10-foot (3 m) straightedge as the joints are finished and any irregularities in excess

of 1/4-inch (6 mm) shall be corrected before the concrete has hardened. Longitudinal construction joints that do not meet these requirements or which show significant cracking or planes of weakness shall be sawed-off full depth at the Contractor's expense using the minimum practical width at locations designated by the Engineer. When required, keyways shall be accurately formed with a template of metal or wood. The gauge or thickness of the material in the template shall be such that the full keyway, as specified, is formed and is in the correct location. Transverse joints shall be right angles to the centerline of the pavement and shall extend the full width of the slab. All joints shall be so prepared, finished, or cut to provide a groove of the width and depth shown on the plans.

2. Tie Bars: Tie bars shall consist of deformed bars installed principally in longitudinal joints as shown on the plans or the bars shall be extensions of the distributed reinforcing steel across the joints. Tie bars shall be placed at right angles to the centerline of the concrete slab. They shall be held in position parallel to the surface and midway between the surfaces of the slab. These bars shall not be painted, greased, or enclosed in sleeves. At all locations where tie bars are specified and where pavement is in place, the tie bars shall be inserted by drilling and grouting with approved epoxy material. Tie bars in longitudinal construction joints may be installed by bending the bars flush with a keyed joint.

3. Dowel Bars: If used, dowel bars or other load-transfer units of an approved type shall be placed across transverse or other joints in the manner as specified on the plans. They shall be of the dimensions and spacing as shown and held rigidly in the middle of the slab depth in the proper horizontal and vertical alignment by an approved assembly device to be left permanently in place. The dowel or load-transfer and joint devices shall be rigid enough to permit complete assembly as a unit ready to be lifted and placed into position. A metal, or other type, dowel expansion cap or sleeve shall be furnished for each dowel bar used with expansion joints. These caps shall be substantial enough to prevent collapse and shall be placed on the ends of the dowels as shown on the plans. The caps or sleeves shall fit the dowel bar tightly and the closed end shall be watertight.

B. Installation: Joints in concrete pavements shall be cut as shown on the plans. Equipment shall be as described in Paragraph 3.1. The circular cutter shall be capable of cutting a groove in a straight line and shall produce a slot at least 1/8-inch (3 mm) wide and to the depth shown on the plans. When shown on the plans or required by the specifications, the top portion of the slot or groove shall be widened by means of a second shallower cut or by suitable and approved beveling to provide adequate space for joint sealers. Sawing of the joints shall commence as soon as the concrete has hardened sufficiently to permit cutting without chipping, spalling, or tearing. Sawing shall be carried on both during the day and night as required. The joints shall be sawed at the required spacing consecutively in sequence of the concrete placement, unless otherwise approved by the Engineer.

C. Longitudinal Joints.

1. Construction. Longitudinal construction joints shall be formed against suitable side forms (usually made of steel) with or without keyways. Wooden forms may be used under special conditions, when approved by the Engineer. Where butt-type joints with dowels are designated, the dowels for this type shall be painted and greased. The edges of the joint shall be finished with a grooving tool or edging tool, and a space or slot shall be formed along the joint of the dimensions, as indicated, to receive the joint sealing material. Longitudinal construction joints shall be sawed to provide a groove at the top conforming to the details and dimensions indicated on the plans. Provisions shall be made for the installation of tie bars as noted on the plans.

2. Contraction or Weakened-plane type. The longitudinal groove sawed in the top of the slab shall be installed where indicated on the drawings. The groove shall be sawed with approved equipment in the hardened concrete to the dimensions required. The sawed groove shall be straight and of uniform width and depth. The groove shall be clean cut so that spalling will be avoided at intersections with transverse joints. Tie bars or distributed reinforcing steel shall be installed across these joints were indicated on the plans.

3. Expansion. Longitudinal expansion joints shall be installed as indicated on the plans. The premolded filler, of the thickness as shown on the plans, shall extend for the full depth and width of the slab at the joint, except for space for sealant at the top of the slab. The filler shall be securely staked or fastened into position perpendicular to the proposed finished surface. A cap shall be provided to protect the top edge of the filler and to permit the concrete to be placed and finished. After the concrete has been placed and struck off, the cap shall be carefully withdrawn leaving the space over the premolded filler. The edges of the joint shall be finished and tooled while the concrete is still plastic.

D. Transverse Joints.

1. Expansion. Transverse expansion joints shall be installed at the locations and spacing as shown on the plans. The joints shall be installed at right angles to the centerline and perpendicular to the surface of the pavement. The joints shall be installed and finished to insure complete separation of the slabs. Expansion joints shall be of a premolded type conforming to these specifications and with the plans and shall be the full width of the pavement strip. All concrete shall be cleaned from the top of the joint material. Before the pavement is opened to traffic, this space shall be swept clean and filled with approved joint sealing material. All devices used for the installation of expansion joints shall be approved by the Engineer. They shall be easily removable without disturbing the concrete and held in proper transverse and vertical alignment. Immediately after forms are removed, any concrete bridging the joint space at the ends shall be removed for the full width and depth of the joint. When specified, expansion joints shall be equipped with dowels of the dimensions and at the spacing and location indicated on the plans. The dowels shall be firmly supported in place and accurately aligned parallel to the subgrade and the centerline

of the pavement by means of a dowel assembly which will remain in the pavement and will ensure that the dowels are not displaced during construction. Other types of load-transfer devices may be used, when approved by the Engineer.

2. Contraction. Transverse contraction joints, weakened-plane joints, or both, shall be installed at the locations and spacing as shown on the plans. These joints will be installed by sawing a groove into the concrete surface after the concrete has hardened in the same manner as specified in Paragraph 3.8(c)(2). Dowel bar assemblies shall be installed, when required, as shown on the plans.

3. Construction. Transverse construction joints shall be installed at the end of each day's placing operations and at any other points within a paving lane when concrete placement is interrupted for more than 30 minutes or it appears that the concrete will obtain its initial set before fresh concrete arrives. When the installation of the joint can be planned in advance, it shall be located at a contraction or expansion joint. The joint shall not be allowed within 8 feet (2.4 m) of a regular spaced transverse joint. If the pouring of the concrete has been stopped, causing a joint to fall within this limit, it shall not be installed, and the fresh placed concrete shall be removed back to the 8 foot (2.4 m) limit.

3.9 FINAL STRIKE-OFF, CONSOLIDATION, AND FINISHING:

A. Sequence. The sequence of operations shall be the strike-off and consolidation, floating and removal of laitance, straightedging, and final surface finish. The addition of superficial water to the surface of the concrete to assist in finishing operations generally will not be permitted. If the application of water to the surface is permitted, it shall be applied as a fog spray by means of approved spray equipment.

B. Finishing at Joints. The concrete adjacent to joints shall be compacted or firmly placed without voids or segregation against the joint material; it shall be firmly placed without voids or segregation under and around all load-transfer devices, joint assembly units, and other features designed to extend into the pavement. Concrete adjacent to joints shall be mechanically vibrated. After the concrete has been placed and vibrated adjacent to the joints, the finishing machine shall be operated in a manner to avoid damage or misalignment of joints. If uninterrupted operations of the finishing machine, to, over, and beyond the joints, cause segregation of concrete, damage to, or misalignment of the joints, the finishing machine shall be stopped when the screed is approximately 8 inches (20 cm) from the joint. Segregated concrete shall be removed from the front of and off the joint; the screed shall be lifted and set directly on top of the joint, and the forward motion of the finishing machine shall be resumed. Thereafter, the finishing machine may run over the joint without lifting the screed, provided there is no segregated concrete immediately between the joint and the screed or on top of the joint.

C. Machine Finishing. The concrete shall be spread as soon as it is placed, and it shall be struck off and screeded by an approved finishing machine. The machine shall go over each area as many times and at such intervals as necessary to give the proper

consolidation and to leave a surface of uniform texture. Excessive operation over a given area shall be avoided. When side forms are used, the tops of the forms shall be kept clean by an effective device attached to the machine, and the travel of the machine on the forms shall be maintained true without lift, wobbling, or other variation tending to affect the precision finish. During the first pass of the finishing machine, a uniform ridge of concrete shall be maintained ahead of the front screed for its entire length. When in operation, the screed shall be moved forward with a combined longitudinal and transverse shearing motion, always moving in the direction in which the work is progressing, and so manipulated that neither end is raised from the side forms during the striking-off process. If necessary, this shall be repeated until the surface is of uniform texture, true to grade and cross section, and free from porous areas.

D. Hand Finishing. Hand finishing methods will not be permitted, except under the following conditions: In the event of breakdown of the mechanical equipment, hand methods may be used to finish the concrete already deposited on the grade; in areas of narrow widths or of irregular dimensions where operation of the mechanical equipment is impractical. Concrete, as soon as placed, shall be struck off and screeded. An approved portable screed shall be used. The screed for the surface shall be at least 2 feet (0.6 m) longer than the maximum width of the slab to be struck off. It shall be of approved design, sufficiently rigid to retain its shape, and shall be constructed either of metal or of other suitable material covered with metal. Wood will not be permitted. Consolidation shall be attained by the use of a suitable vibrator.

E. Floating. After the concrete has been struck off and consolidated, it shall be further smoothed, trued, and consolidated by means of a longitudinal float, using one of the following methods:

1. Hand Method. The hand-operated longitudinal float shall not be less than 12 feet (3.6 m) in length and 6 inches (15 cm) in width, properly stiffened to prevent flexibility and warping. The longitudinal float, operated from foot bridges resting on the side forms and spanning but not touching the concrete, shall be worked with a sawing motion, while held in a floating position parallel to the slab centerline and passing gradually from one side of the slab to the other. Forward movement along the centerline of the slab shall be in successive advances of not more than one-half the length of the float. Any excess water or soup material shall be wasted over the slab edge on each pass.

2. Mechanical Method. The Contractor may use a machine composed of a cutting and smoothing float(s), suspended from and guided by a rigid frame. The frame shall be carried by four or more visible wheels riding on, and constantly in contact with, the side forms or pavement subgrade. If necessary, long-handled floats having blades not less than 5 feet (1.5 m) in length and 6 inches (1.5 cm) in width may be used to smooth and fill in open-textured areas in the slab. Long-handled floats shall not be used to float the entire surface of the slab in lieu of mechanical methods. After floating, any excess water and laitance shall be removed from the surface of the slab

by a straightedge 10 feet (3 m) or more in length. Successive drags shall be lapped one-half the length of the blade.

F. Straight-edge Testing and Surface Correction. After the pavement has been struck off and consolidated and while the concrete is still plastic, it shall be tested for trueness with a 16-foot (4.8 m) straightedge. For this purpose the Contractor shall furnish and use an accurate 16-foot (4.8 m) straightedge swung from handles 3 feet (0.4 m) longer than one-half the width of the slab. The straightedge shall be held in contact with the surface in successive positions parallel to the centerline and the whole area gone over from one side of the slab to the other, as necessary. Advancing shall be in successive stages of not more than one-half the length of the straightedge. Any excess water and laitance shall be removed from the surface of the pavement. Any depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. High areas shall be cut down and refinished. Special attention shall be given to assure that the surface across joints meets the requirements for smoothness. Straightedge testing and surface corrections shall continue until the entire surface is found to be free from observable departures from the straightedge and until the slab conforms to the required grade and cross section. The use of long-handled wood floats shall be confined to a minimum; they may be used only in emergencies and in areas not accessible to finishing equipment.

3.10 SURFACE TEXTURE:

A light broom drag shall be used for slab concrete pavements. The direction of the texture device shall be as directed by the Engineer. Contractor to match existing pavement finishes.

3.11 SURFACE TEST:

As soon as the concrete has hardened sufficiently, the pavement surface shall be tested with a 16-foot (5 m) straightedge or other specified device to determine its compliance with design grades. Where the departure from correct cross section exceeds ½ inch (13 mm), the pavement shall be ground down with a approved grinding machine to within 1/4 inch of tolerance or removed and replaced at the expense of the Contractor when so directed by the Engineer. Cracked or damaged slabs shall be removed and replaced at the expense of the Contractor when so directed by the Engineer. Any area or section so removed shall not be less than 20 feet (6 m) in length or less than the full width of the lane involved, whichever is greatest. When it is necessary to remove and replace a section of pavement, and remaining portion of a slab adjacent to the joints that is less than 10 feet (3 m) in length shall also be removed and replaced.

3.12 CURING:

Immediately after the finishing operations have been completed and marring of the concrete will not occur, the entire surface of the newly placed concrete shall be cured in accordance

with one of the methods below. In all cases in which curing requires the use of water, the curing shall have prior right to all water supply or supplies. Failure to provide sufficient cover material of whatever kind the Contractor may elect to use, or lack of water to adequately take care of both curing and other requirements, shall be cause for immediate suspension of concreting operations. The concrete shall not be left exposed for more than 1/2 hour during the curing period. The following are alternate approved methods for curing concrete pavements.

A. Impervious Membrane Method. The entire surface of the pavement shall be sprayed uniformly with white pigmented curing compound immediately after the finishing of the surface and before the set of the concrete has taken place. The curing compound shall not be applied during rainfall. Curing compound shall be applied by mechanical sprayers under pressure at the rate of 1 gallon (4 liters) to not more than 150 square feet (14 square meters). The spraying equipment shall be of the fully atomizing type equipped with a tank agitator. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. During application the compound shall be stirred continuously by effective mechanical means. Hand spraying of odd widths or shapes and concrete surfaces exposed by the removal of forms will be permitted. Curing compound shall not be applied to the inside faces of joints to be sealed, but approved means shall be used to insure proper curing for 72 hours. The curing compound shall be of such character that the film will harden within 30 minutes after application. Should the film become damaged from any cause within the required curing period, the damaged portions shall be repaired immediately with additional compound. Upon removal of the side forms, the sides of the exposed slabs shall be protected immediately to provide a curing treatment equal to that provided for the surface. For the Impervious Membrane Method, the Contractor is encouraged to include Polyethylene Film dispensing equipment in the Paving Train to provide protection to the finished work in case of rainfall.

B. Polyethylene Films. The top surface and sides of the pavement shall be entirely covered with polyethylene sheeting. The units shall be lapped at least 18 inches (457 mm). The sheeting shall be placed and weighted to cause it to remain in contact with the surface covered. The sheeting shall have dimensions that will extend at least twice the thickness of the pavement beyond the edges of the pavement. Unless otherwise specified, the sheeting shall be maintained in place for 72 hours after the concrete has been placed.

C. Waterproof Paper. The top surface and sides of the pavement shall be entirely covered with waterproofed paper. The units shall be lapped at least 18 inches (457 mm). The paper shall be placed and weighted to cause it to remain in contact with the surface covered. The paper shall have dimensions that will extend at least twice the thickness of the pavement beyond the edges of the slab. The surface of the pavement shall be thoroughly wetted prior to placing of the paper. Unless otherwise specified, the paper shall be maintained in place for 72 hours after the concrete has been placed.

D. White Burlap-Polyethylene Sheets. The surface of the pavement shall be entirely covered with sheeting. The sheeting used shall be such length (or width) that it will

extend at least twice the thickness of the pavement beyond the edges of the slab. The sheeting shall be placed so that the entire surface and both edges of the slab are completely covered. The sheeting shall be placed and weighted to remain in contact with the surface covered, and the covering shall be maintained fully wetted and in position for 72 hours after the concrete has been placed.

E. Curing in Cold Weather. When the average daily temperature is below 40 degrees F (4 degrees C), curing shall consist of covering the newly laid pavement with not less than 12 inches (30 cm) of loose, dry hay or straw, or equivalent protective curing authorized by the Engineer, which shall be retained in place for 10 days. The hay or straw shall be secured to avoid being blown away. Admixture for curing or temperature control may be used only when authorized by the Engineer. When concrete is being placed and the air temperature may be expected to drop below 35 degrees F (2 degrees C), a sufficient supply of straw, hay, grass, or other suitable blanketing material such as burlap or polyethylene shall be provided along the work. Any time the temperature may be expected to reach the freezing point during the day or night, the material so provided shall be spread over the pavement to a sufficient depth to prevent freezing of the concrete. The period of time such protection shall be maintained shall not be less than 10 days. A minimum of 3 days is required when high, early strength concrete is used. The Contractor shall be responsible for the quality and strength of the concrete placed during cold weather, and any concrete injured by frost action shall be removed and replaced at the Contractor's expense.

3.13 REMOVING FORMS:

Unless otherwise specified, forms shall not be removed from freshly placed concrete until it has set for at least 12 hours, except where auxiliary forms are used temporarily in widened areas. Forms shall be removed carefully to avoid damage to the pavement. After the forms have been removed, the sides of the slab shall be cured as outlined in one of the methods indicated in Paragraph 3.17. Major honeycombed areas shall be considered as defective work and shall be removed and replaced. Any area or section so removed shall not be less than 20 feet (6 m) in length nor less than the full width of the lane involved. When it is necessary to remove and replace a section of pavement, any remaining portion of the slab adjacent to the joints that is less than 10 feet (3 m) in length shall also be removed and replaced.

3.14 SEALING JOINTS:

The joints in the pavement shall be prepared and sealed in strict accordance with the sealant manufacturer's printed recommendations.

3.15 PROTECTION OF PAVEMENT:

The Contractor shall protect the pavement and its appurtenances against both public traffic and traffic caused by the Contractor's employees and agents. This shall include watchmen to direct traffic and the erection and maintenance of warning signs, lights, pavement bridges, or

crossovers, etc. The plans or special provisions will indicate the location and type of device or facility required to protect the work and provide adequately for traffic. Any damage to the pavement occurring prior to final acceptance shall be repaired or the pavement replaced at the Contractor's expense. In order that the concrete be properly protected against the effects of rain before the concrete is sufficiently hardened, the Contractor is encouraged to have available at all times materials for the protection of edges and surface of the unhardened concrete. Such protective materials shall consist of rolled polyethylene sheeting at least 4 mils (0.1 mm) thick of sufficient length and width to cover the plastic concrete slab and any edges. The sheeting may be mounted on either the paver or a separate movable bridge from which it can be unrolled without dragging over the plastic concrete surface. When rain appears imminent, all paving operations shall stop and all available personnel should begin covering the surface of the unhardened concrete with the protective covering.

3.16 OPENING TO TRAFFIC:

The Engineer shall decide when the pavement shall be opened to traffic. The pavement will not be opened to traffic until test specimens molded and cured in accordance with ASTM C31 have attained a flexural strength of 550 pounds per square inch (3792 kPa) when tested in accordance with ASTM C78. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Prior to opening to traffic, the pavement shall be thoroughly cleaned.

3.17 SURFACE AND THICKNESS TOLERANCES:

Extreme care must be exercised in all phases of the operation to assure the pavement will pass the specified tolerances. The following tolerances are applicable:

A. Lateral deviation from established alignment of the pavement edge shall not exceed plus or minus 0.10 foot (30 mm) in any lane.

B. Vertical deviation from established grade shall not exceed plus or minus 0.04 foot (12 mm) at any point.

C. Surface smoothness deviations shall not exceed 3/8 inch (6 mm) from a 16-foot (5 m) straightedge placed in any direction, including placement along and spanning any pavement joint or edge. No additional payment over the contract unit price shall be made for any pavement of a thickness exceeding that required by plans.

3.18 INTEGRAL CURBS:

Where shown on the drawings, integral curbs shall be installed to the dimension shown using identical concrete to the paving mix. Expansion and contraction joints shall extend through curb section. Reinforcing for integral curb, when shown on the plans, shall be supported from the ground with driven stakes or as directed by the Engineer. Once the forms are removed, all voided areas shall be rubbed and filled with non-shrink grout within 24

hours. If the forms are removed within 2 days of placement, the curb shall be treated with a specified curing membrane.

3.19 CONCRETE CURB AND GUTTER:

Concrete curb and gutter shall be constructed using concrete of the type and strength specified in the plans. The placement, strike-off consolidation and finishing shall be made using applicable portions of this specification as determined by the Engineer. Contraction joints shall be placed at 20-foot centers with the use of a 1/2" deep grooving tool. Expansion joints shall be placed at a maximum spacing of 400 feet and at all radius points, curb returns and junctions with structures. For curves of 100 feet radius or less, contraction joints shall be tooled at 10-foot centers and expansion joints constructed at 50-foot centers. Expansion joints shall contain a minimum of two smooth dowels a minimum of one bar size larger than the longitudinal reinforcing and 3/4-inch thick expansion joint material of the type specified in the plans. Expansion joints shall be sealed in accordance with the plan details.

3.20 SIDEWALKS AND SLOPE PAVING:

Concrete sidewalks and slope paving shall be constructed to use concrete of the type and strength specified in the plans. The placement, strike-off, consolidation and finishing shall be made using applicable portions of this specification as determined by the Engineer. Contraction joints shall be tooled at a depth of 1/2" at spacing equal to the width of the sidewalk, not to exceed six feet maximum. For walks wider than six feet, longitudinal joints shall be tooled at equal spacing, not less than three feet. Edges shall be tooled with a 1/4-inch radius and finish slightly higher than adjacent curbs to ensure proper drainage if some settlement occurs. Expansion joints shall be placed at 100-foot intervals or at intersecting walk locations. Expansion joints shall be 3/4-inch in thickness and contain smooth dowels at not less than 12" spacing. The size of the dowels will be equal to the thickness of the sidewalk in inches. Scoring and tooling for barrier free ramps shall be made in accordance with governing City standards or as directed by the Engineer.

3.21 FIELD TEST SPECIMENS:

Concrete samples shall be furnished by the Contractor and shall be taken in the field to determine the consistency, air content, and strength of the concrete. Compressive test cylinders shall be made each day that the concrete is placed. However, at the start of paving operations and when the aggregate source, aggregate characteristics, or mix design is changed, additional groups of test cylinders may be required until the Engineer is satisfied that the concrete mixture being used complies with the strength requirements of these specifications. Test ages will be 7 days and 28 days. Test cylinders for compressive strength tests shall be taken and cured in accordance with ASTM C-31 and tested in accordance with ASTM C-39. At least four cylinders (a set) shall be made for each 50 cubic yards or fraction thereof placed and tested at 7 days and 28 days. No extra compensation will be allowed for materials and work involved in fulfilling these requirements.

Concrete will be accepted on the basis of tests conducted on a "lot" of concrete. A lot will consist of 200 cubic yards and will be divided into four equal sublots. One set of tests will be made for each sublot. Random samples will be taken from the plastic concrete at the site in accordance with accepted statistical procedures.

The concrete shall be sampled in accordance with ASTM C172. The lot will be accepted without adjustment in payment if the average 28 day compressive strength, based on four acceptance tests, indicates a strength deficiency of not less than 100 psi. The pay factor for 28-day compressive strengths showing a deficiency greater than 100 psi are listed in the table below.

PAY FACTOR SCHEDULE FOR COMPRESSIVE STRENGTH
AT THE SPECIFIED INTERVAL

Strength Deficiency (Based on an Average of 4 Cylinders) psi	Pay Factor (Percent of Contract Unit Price) psi
0 - 100	100
101 - 150	85
151 - 200	75
201 - 250	70
251 - 300	60
301 - 375	55
376 - 500	50
> 500	Reject

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT:

A. Concrete Pavement\Slab: The area of new pavement to be paid for shall be the number of square yards of various types and thickness of Concrete Pavement as specified, in place, complete and accepted, less deductions, as herein before described for deficient thickness or strength, including any thickened edges as shown on the plans.

B. Curbs. Integral Curb or Curb and Gutter of the type and size specified shall be measured per linear foot complete in place excluding the face of inlets, but including transitions at recessed inlets.

C. Headers. Concrete Pavement Headers shall be measured per linear foot complete in place.

D. Sidewalks. Sidewalks shall be measured by the square foot of the thickness specified, complete and accepted in place, with or without lugs.

4.2 PAYMENT:

A. The work performed and materials furnished under this section and measured as provided under Measurement will be paid for at the unit price bid per the bid proposal of the type and thickness as specified, or the adjusted unit price for payment of deficient thickness or strength as provided herein, which price shall be full compensation for shaping, furnishing, and applying all water required; for furnishing, loading, and unloading, storage, hauling and handling all concrete ingredients, and all freight and royalty involved; for mixing, placing, finishing, sawing, cleaning and sealing joints, and curing all concrete, for furnishing and installing all reinforcing steel; for furnishing all materials for sealing joints, steel dowel caps and load transmission devices required and wire and devices for placing, holding and supporting the steel bars, load transmission devices and joint filler material in proper position; for coating steel bars when required by the plans and for all manipulations, labor, equipment, appliances, tools, traffic provisions, and incidentals necessary to complete the work.

END OF SECTION

SECTION 02640

CONCRETE SIDEWALKS

PART 1 - GENERAL

1.01 DESCRIPTION

A. This item shall govern the installation of sidewalks, with reinforcing steel, composed of Portland Cement concrete, constructed on an approved subgrades in conformity with the lines and grades established by the plans and details, and for the disposal of all material obtained from such installation. The work to be done under this item shall include all necessary forming, compaction, concrete work, and the removal of all structures or portions thereof such as trees, brush, mail boxes, and all other obstructions necessary to the proposed construction.

PART 2 - MATERIAL

2.01 Concrete

A. Materials and proportions used in construction under this item shall conform to the requirements of Class "A" Concrete 4 ½ 5 sack cement mix and shall have a minimum compressive 28 days strength of 3,000 pounds per square inch.

B. Reinforcing Steel - The reinforcing steel shall be a welded wire fabric made from cold-drawn wire smooth with a minimum yield strength of 56,000 pounds per square inch. The style designation shall be 6" x 6" x W 1.4 or Equal. (6" x 6” No. 10 6).

PART 3 - CONSTRUCTION METHOD

A. The subgrade shall be excavated and shaped to line, grade and cross section and if considered necessary in the opinion of the ENGINEER, place 2” of sand cushion, hand tamped and sprinkled. The subgrade shall be moist at the time the concrete is placed.

B. Forms shall be of wood or metal, straight, free from warp, and of a depth equal to the thickness of the finished work. They shall be securely staked to line and grade and maintained in a true position during the depositing of concrete.

C. The reinforcing steel shall be placed in position as shown on the plans. Care shall be taken to keep all reinforcing steel in its proper locations.

D. Sidewalks shall be constructed in sections of the lengths shown on plans. The different sections shall be separated by 2 pre-molded or board joint of the thickness shown on the plans, placed vertically and at right angles to the longitudinal axis of the sidewalk. Where the sidewalk abut a curb or retaining wall, approved expansion material shall be places along

their entire length. Similar expansion material shall be placed around all obstructions protruding through sidewalk.

E. Concrete shall be mixed in a manner satisfactory to the Engineer, placed in the forms to the depth specified and spaded and tamped until thoroughly compacted and mortar entirely covers the surface. The top surface shall be floated with a wooden float to a gritty texture to the satisfaction of the Engineer.

F. Sidewalks shall be marked into sections, each 6 feet maximum in length, by the use of approved jointing tools.

G. When completed, the, sidewalks shall be cured in accordance with the requirements of the Item, "Membrane Curing", Type 2, white pigmented.

PART 4 - PAYMENT

A. The work performed and materials furnished as prescribed by the item shall be measured by the square foot of surface area of completed sidewalk. This item will be paid for at contract unit price bid for "Concrete Sidewalks", which price shall be full compensation for preparing the subgrade; for furnishing and placing all materials, including all reinforcing steel and expansion joint materials; and for all manipulation, labor, tools, equipment and incidentals necessary to complete the work.

END OF SECTION

SECTION 02680

FLAT WHEEL ROLLING

PART 1- GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. This work shall consist of the compaction of subgrade, embankment, flexible base, surface treatments and asphalt surfaces by the operation of an approved power roller as herein specified and as directed by the ENGINEER.

PART 2 - PRODUCTS

2.01 EQUIPMENT:

A. Embankments and Flexible Bases

1. Power rollers shall be of the 3-wheel, self-propelled type, weighing not less than 10 tons and shall provide a compression on the rear wheels of not less than 325 pounds per linear foot of wheel width. All wheels shall be flat.

2. The rear wheels shall have a diameter of not less than 48 inches and each shall have a wheel width of not less than 20 inches.

B. Surface Treatments and Pavements

1. Power rollers shall be the 3-wheel or tandem, self-propelled type, weighing not less than 3 tons nor more than 6 tons. All wheels shall be flat.

2. Rollers shall be equipped with an adequate scraping or cleaning device on each wheel.

3. Rollers used to compact asphalt mixture shall be equipped with a water system which will keep all tires uniformly wet.

4. In lieu of the rolling equipment specified, the CONTRACTOR may operate other compacting equipment that will produce equivalent relative compaction in the same period of time as the specified equipment. If the substituted compaction equipment fails to produce the desired compaction within the same period of time, its use shall be discontinued.

5. Rollers shall be maintained in good repair and operating condition and shall be approved by the ENGINEER.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS:

A. Subgrades, Embankments and Flexible Base

1. The subgrade, embankment layer, or the base course shall be sprinkled if directed. Rolling with a power roller shall start longitudinally at the sides and proceed towards the center, overlapping on successive trips by at least 1/2 the width of the rear wheel of the power roller.

2. On super-elevated curves, rolling shall begin at the low sides and progress toward the high sides. Alternate trips of the roller shall be slightly different in length.

3. The rollers, unless otherwise directed, shall be operated at a speed between 2 and 3 miles per hour.

B. Surface Treatments and Pavements

1. Rolling shall be done to produce a satisfactory surface as called for in surface treatment and pavement items.

2. The sequence of work shall be as indicated for embankment layer or base course.

3. The operating speed shall be determined by the CONTRACTOR.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT AND PAYMENT:

A. No additional compensation will be made for materials, equipment or labor required by this item, and shall be considered incidental to the other items included in the contract.

END OF SECTION

SECTION 02721

VINYL COATED CHAINLINK FENCING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK AND RELATED DOCUMENTS

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation and services required and incidental thereto, as shown on the Drawings and/or specified herein including but not limited to; the furnish and install of vinyl coated fence fabric, fence posts, fence hardware, gates, slats and maintenance strip

B. Related Work Specified Elsewhere:

1. Excavation: Section 02230
2. Cast-In-Place Concrete: Section 03300
3. Galvanized Chain-link Fencing: Section 02720

1.2 QUALITY ASSURANCE

A. Provide chain link fences produced by a single manufacturer, including necessary erection accessories, fittings and fasteners.

B. Fence work to be performed by a single firm specializing in commercial fence work of similar size and quality with a minimum of five (5) years experience. The Engineer/Architect shall review qualifications and approve subcontractor prior to commencing work.

C. Deliver chain link fence materials in the manufacturer’s original packaging with tags and labels intact and legible.

D. Handle and store material to prevent damage and deterioration.

1.3 SUBMITTALS

A. The Contractor shall submit manufacturer’s specifications for all fence materials. The submittal shall include the manufacturer's name, model number, and manufacturer's installation recommendation, if applicable, for each proposed item in accordance with Section 01300.

B. No partial submittal will be accepted and submittals shall be neatly bound into a binder and logically organized. After the submittal has been approved, substitutions will not be allowed except by written consent of the Engineer/Architect.

C. Approval of the submittals is required prior to delivery of any materials to the job site.

D. Shop drawings shall include dimensions, elevations, construction details, arrangements, and capacity of equipment, as well as manufacturer's installation recommendations. Shop drawings are required for each gate.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fence fabric shall be 9 gauge (0.148 inch diameter), zinc coated steel wire, 2" by 2" diamond woven mesh with selvage knuckled top and bottom. Fabric shall be PVC coated per ASTM F668 Class 2b, green color.

B. Fence framing shall be galvanized steel pipe and shall meet the requirements of ASTM A120, schedule 40, except the hydrostatic testing requirement is waived. Galvanizing shall be in accordance with ASTM A123 (minimum 1.8 oz. zinc per sq. ft. of coated surface). The steel used in all structural shapes shall conform to the requirements of ASTM A572, Grade 45. In accordance with ASTM F1043, apply supplemental color coating of 10 to 15 mils (0.254 - 0.38 mm) of thermally fused PVC in green color to match fabric. All pipe shall be round unless otherwise indicated.

C. Wire fabric ties, and tension wire for use in conjunction with a given type of fabric shall be of the same material identified with the fabric type. The tension wire shall be 7-gauge galvanized soft drawn steel wire coated similarly to the respective wire fabric being used.

D. Wire fabric ties shall be hog rings of galvanized steel wire not less than 9 gauge and spaced no greater than 12 inch.

E. Gate frames shall consist of galvanized steel pipe and conform to the specifications for the same material under Section 2.1. The fabric shall be of the same type material as used in the fence.

F. Gate latch shall be galvanized and vinyl coated to match fence fabric, forked type capable of retaining gate in closed position and have provision for padlock. Latch shall permit operation from either side of gate. Provide locking device and padlock eyes as an integral part of latch, requiring one padlock for locking both gate leaves. Or as specified on Drawings.

G. Gate hinges shall be galvanized and vinyl coated to match fence fabric,, structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off offset type hinge design shall permit gate to swing 180° inward or 180° outward. Or as specified on Drawings.

H. Miscellaneous steel fittings and hardware for use with zinc-coated steel fabric shall be of commercial grade steel or better quality, wrought of cast as appropriate to the article, and sufficient in strength to provide a balanced design when used in conjunction with fabric, posts, and wires of the quality specified herein. All steel fittings and hardware shall be protected with a zinc coating applied in conformance with ASTM A153. All fittings and hardware shall be vinyl coated to match fabric.

I. Concrete shall be of a commercial grade with a minimum 28-day compressive strength of 3,000 psi.

PART 3 - INSTALLATION

3.1 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Notify the Engineer/Architect of unsatisfactory conditions. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected and the Engineer/Architect has provided written acceptance. Beginning work indicates acceptance of the site as satisfactory by the installer.

B. Ensure property lines and legal boundaries of work are clearly established.

C. Contractor shall layout all fence lines carefully marking all post positions per the Drawings. Locate end (terminal) and corner posts at each fence termination, opening and change in horizontal or vertical direction of 30° or more. Space line posts equally and uniformly, at no more than 10 feet o.c. Layout must be approved by Engineer/Architect prior to installation.

3.2 EXECUTION

A. Install the chain link fence system in accordance with the manufacturer's installation instructions.

B. Drill post holes into firm, undisturbed, or compacted earth.

C. Excavate for concrete maintenance strip.

D. Set posts and place concrete. Align each post both vertically and laterally. Brace in position during earth placing and tamping.

1. Slope concrete to direct water away from posts.

E. Brace assemblies: Install brace assemblies at each end post, pull post, and both sides of corner posts with brace rails and adjustable 3/8" diameter truss rods.

F. Pour the concrete maintenance strip before the fence fabric has been installed. The concrete shall run continuously through and above the tops of the individual fence post footings. Where the concrete strip abuts an existing sidewalk it shall be at the same finish grades as the sidewalk. Slope maintenance strip to drain. Protect all posts by wrapping them to protect from concrete splatter. Any concrete residue, which may get onto the posts, must be removed completely and immediately, so as not to be visible, whatsoever. Let concrete maintenance strip sufficiently cure (minimum 72 hours) before continuing with fence install.

G. Tension wire: Install tension wires before stretching fabric and tie to each post with wire ties or clips.

H. Stretch fabric tight between terminal posts. Install fabric on outside of fence, or as directed on Drawings, and anchor securely to framework. Cut fabric to form continuous piece between terminal posts.

1. Position bottom selvage of fabric flush with finish grade or concrete maintenance strip.

2. Pull the fabric taut and clip or tie to posts at 15" o.c., and top rail and bottom tension wire at 18" o.c.
3. Anchor to framework so that the fabric remains in tension after the pulling force is released using tension bars and tension bands.
4. Bend wire ties to minimize hazard to persons.
5. Stretcher bars threaded through fabric and secured to posts with metal bands not over 15" o.c.

I. Install fence gates and adjust as needed to provide fluid swing movement.

J. Provide a rigid, plumb, finished fence structure with fabric tight and in tension.

3.3 CLEANING AND PROTECTION

A. The Contractor shall perform all necessary cleaning and removal of excess soil, wire clippings, debris, equipment, etc., during installation and upon completion of the work. The Contractor shall immediately repair any damage resulting from fencing operations without cost to the Owner.

PART 4 - METHOD OF MEASUREMENT

MEASUREMENT:

Vinyl Chain-link fencing as described in this section will be paid for on a lump sum basis wherein no measurement will be made.

PART 5 - BASIS OF PAYMENT

PAYMENT:

A. Vinyl Chain-link fencing will be paid for at the Contract lump sum, which price will be full compensation for furnishing and installing equipment; shop drawings; providing all submittals and warranties; furnishing all labor, materials, tools, equipment; and incidentals necessary to complete the work as described in this section and related other sections of these Contract Documents, as well as maintenance until final acceptance.

END OF SECTION

SECTION 02722

VINYL FENCING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK AND RELATED DOCUMENTS

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation and services required and incidental thereto, as shown on the Drawings and/or specified herein including but not limited to; the furnish and install of vinyl fence, fence posts, fence hardware, gates, slats and maintenance strip

B. Related Work Specified Elsewhere:

1. Excavation: Section 02230
2. Cast-In-Place Concrete: Section 03300

1.2 QUALITY ASSURANCE

A. Provide fences produced by a single manufacturer, including necessary erection accessories, fittings and fasteners.

B. Fence work to be performed by a single firm specializing in commercial fence work of similar size and quality with a minimum of five (5) years experience. The Engineer/Architect shall review qualifications and approve subcontractor prior to commencing work.

C. Deliver fence materials in the manufacturer’s original packaging with tags and labels intact and legible.

D. Handle and store material to prevent damage and deterioration.

1.3 SUBMITTALS

A. The Contractor shall submit manufacturer’s specifications for all fence materials. The submittal shall include the manufacturer's name, model number, and manufacturer's installation recommendation, if applicable, for each proposed item in accordance with Section 01300.

B. No partial submittal will be accepted and submittals shall be neatly bound into a binder and logically organized. After the submittal has been approved, substitutions will not be allowed except by written consent of the Engineer/Architect.

C. Approval of the submittals is required prior to delivery of any materials to the job site.

D. Shop drawings shall include dimensions, elevations, construction details, arrangements, and capacity of equipment, as well as manufacturer's installation recommendations. Shop drawings are required for each gate.

PART 2 - PRODUCTS

2.1 MATERIALS

A. The fence is constructed with materials made of rigid Poly Vinyl Chloride (PVC) formulated to resist impact and for Ultra Violet (UV) stabilization. The Extruded product meets or exceeds ASTM DI 784

B. Rails, Pickets and Posts are cut to specific lengths as required for style specified. Rails are routed to receive pickets. Posts are routed to receive rails at correct heights.

C. Bottom rails for commercial applications contain steel reinforcing for additional strength. Posts caps are PVC molded. External fit flat, gothic & ball styles for true 4"x 4" and 5"x 5"posts. Internal flat cap available for standard wall 5" x 5" posts and 4" x 4" posts.

D. Gate frames constructed from rigid PVC with reinforcement. Gates are designed to match fence sections. All hardware and bracing is included.

E. Hardware should be commercial grade. Gate latch shall be galvanized and vinyl coated to match fence, forked type capable of retaining gate in closed position and have provision for padlock. Latch shall permit operation from either side of gate. Provide locking device and padlock eyes as an integral part of latch, requiring one padlock for locking both gate leaves. Or as specified on Drawings.

F. Gate hinges shall be galvanized and vinyl coated to match fence, structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off offset type hinge design shall permit gate to swing 180° inward or 180° outward. Or as specified on Drawings.

G. Miscellaneous steel fittings and hardware for use with zinc-coated steel fabric shall be of commercial grade steel or better quality, wrought of cast as appropriate to the article, and sufficient in strength. All steel fittings and hardware shall be protected with a zinc coating applied in conformance with ASTM A153. All fittings and hardware shall be vinyl coated to match fence.

H. Concrete shall be of a commercial grade with a minimum 28-day compressive strength of 3,000 psi.

PART 3 - INSTALLATION

3.1 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Notify the Engineer/Architect of unsatisfactory conditions. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected and the Engineer/Architect has provided written acceptance. Beginning work indicates acceptance of the site as satisfactory by the installer.

B. Ensure property lines and legal boundaries of work are clearly established.

C. Contractor shall layout all fence lines carefully marking all post positions per the Drawings. Locate end (terminal) and corner posts at each fence termination, opening and change in horizontal or vertical direction of 30° or more. Space line posts equally and uniformly, at no more than 10 feet o.c. Layout must be approved by Engineer/Architect prior to installation.

3.2 EXECUTION

A. Install the fence system in accordance with the manufacturer's installation instructions.

B. Drill post holes into firm, undisturbed, or compacted earth.

C. Excavate for concrete maintenance strip.

D. Set posts and place concrete. Align each post both vertically and laterally. Brace in position during earth placing and tamping.

1. Slope concrete to direct water away from posts.

E. Brace assemblies: Install brace assemblies at each end post, pull post, and both sides of corner posts with brace rails and adjustable 3/8" diameter truss rods.

F. Install fence gates and adjust as needed to provide fluid swing movement.

G. Provide a rigid, plumb, finished fence structure with fabric tight and in tension.

3.3 CLEANING AND PROTECTION

A. The Contractor shall perform all necessary cleaning and removal of excess soil, debris, equipment, etc., during installation and upon completion of the work. The Contractor shall immediately repair any damage resulting from fencing operations without cost to the Owner.

PART 4 - METHOD OF MEASUREMENT

MEASUREMENT:

Vinyl fencing as described in this section will be paid for on a lump sum basis wherein no measurement will be made.

PART 5 - BASIS OF PAYMENT

PAYMENT:

A. Vinyl fencing will be paid for at the Contract lump sum, which price will be full compensation for furnishing and installing equipment; shop drawings; providing all submittals and warranties; furnishing all labor, materials, tools, equipment; and incidentals necessary to complete the work as described in this section and related other sections of these Contract Documents, as well as maintenance until final acceptance.

END OF SECTION

SECTION 02780

CONCRETE UNIT PAVERS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK AND RELATED DOCUMENTS

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation and services required and incidental thereto, as shown on the drawings and/or specified herein including but not limited to; soil excavation, sub-base preparation, bedding and joint sand, concrete edging, concrete unit pavers and subsequent maintenance requirements.

B. Related Work Specified Elsewhere:

1. Flexible Base: Section 02601
2. Landscape Planting: Section 02900
3. Cast-in-Place Concrete: Section 03300
4. Reinforcing Steel: Section 03330

1.2 DEFINITIONS AND ABBREVIATIONS

A. ASTM – American Society of Testing and Materials

1.3 QUALITY ASSURANCE

A. Work included in this Section must adhere to and comply with ASTM standards C33, C67, C136, C140, C144, C936, C979, D698 and D1557.

B. Work in this Section is to be performed by a single firm specializing in concrete paver unit installation of similar size and quality with a minimum of five (5) years experience. The Engineer/Architect shall review qualifications and approve subcontractor prior to commencing work.

C. Deliver materials in manufacturer's original, unopened, undamaged containers or packaging with identification labels intact. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving. Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift. Unload pavers at job site in such a manner that no damage occurs to the product.

D. Store materials in a protected location so that they are kept free from mud, dirt, and other foreign materials.

E. Cover bedding sand and joint sand with waterproof covering to prevent exposure to rainfall or removal by wind. Secure the covering in place.

F. Do not install sand or pavers during heavy rain. Do not install sand and pavers over frozen base materials. Do not install frozen sand or saturated sand. Do not install concrete pavers on frozen or saturated sand.

1.4 MAINTENANCE AND WARRANTY

A. Maintain the work of this Section for one (1) year after the date of Substantial Completion and until final written acceptance by the Engineer/Architect.

B. Perform the following maintenance operations for a period of one (1) year:

1. Re-sand all joints and gaps, re-level all pavers, and eradicate any weed or vegetative growth within paver areas as required or requested by the Owner.

C. The Engineer/Architect will issue a letter of Final Acceptance for the work covered under this Section after the maintenance period has been completed successfully.

1.5 SUBMITTALS

A. Concrete unit paver manufacturer's paver layout, pattern, color arrangement, relationship of paver joints to fixtures, product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.

B. Sieve analysis per ASTM C136 for grading and bedding sand.

C. Representative full-size samples of each paver type, thickness, color, and finish that indicate the range of color variation and texture expected in the finished installation. Colors will be selected by the Engineer/Architect from manufacturer's available colors.

D. Substitutions: To be considered for approval, substitutions to this Section must be submitted to the Engineer/Architect seven calendar (7) days prior to the bid opening date for review. Submission of an alternate material does not assure acceptance. The submission must clearly state that the submitted material meets the conditions of this Section.

E. Provide a four (4) foot by four (4) foot mock up utilizing the selected color and pattern for approval. Use this area to determine surcharge of the bedding sand layer, joint sizes, lines, laying pattern(s), color(s) and texture of the job. This area will be used as the standard by which the work will be judged. Remove mock-up at the end of the project.

F. No partial submittal will be accepted and submittals shall be neatly bound into a binder and logically organized. After the submittal has been approved, substitutions will not be allowed except by written consent of the Engineer/Architect.

G. Approval of the submittals are required prior to delivery of any materials to the job site.

H. Shop drawings shall include dimensions, elevations, construction details, arrangements, and capacity of equipment, as well as manufacturer's installation recommendations.

PART 2 - PRODUCTS

2.1 CONCRETE PAVERS

A. Concrete pavers shall be supplied by Innovative Block or prior approved equal, La Feria, Texas (956) 797-4200.

B. Pavers shall be Innovative Block – "Texas Three Piece Cobbled" – Pattern to be Random with 4.5"x6", 6"x6" and 6"x9" units all 2-3/8" height (nominal sizes).

C. Pavers shall meet the following requirements set forth in ASTM C936, Standard Specification for Interlocking Concrete Paving Units:

1. Average compressive strength of 8,000 psi (55 MPa) with no individual unit under 7,200 psi (50 MPa).
2. Average absorption of 5% with no unit greater than 7% when tested in accordance with ASTM C 140.
3. Resistance to 50 freeze-thaw cycles when tested in accordance with ASTM C 67.

D. Pigment in concrete pavers shall conform to ASTM C 979.

E. Material shall be manufactured with minimum 50% post consumer aggregate content that has been certified by an independent testing lab.

F. Material shall be manufactured in individual layers on production pallets.

G. Materials shall be manufactured to produce a solid homogeneous matrix in the produced unit.

H. All units shall be sound and free of defects that would interfere with the proper placing of the unit or impair the strength or permanence of the construction.

I. Sampling and testing requirements:

1. Manufacturer shall provide access to lots ready for delivery to the Owner or his authorized representative for testing in accordance with ASTM 936-82 for sampling of material prior to commencement of paver placement.
2. Manufacturer shall provide a minimum of three (3) years testing backup data showing manufactured products that meet and exceed ASTM 936-82 when tested in compliance with ASTM C-140.
3. Sampling shall be random with a minimum of nine (9) specimens per 20,000 sq. ft. per product shape and size with repeated samples taken every additional 20,000 sq. ft. or a fraction thereof.
4. Test units in accordance with ASTM for compressive strength, absorption and dimensional tolerance. A minimum of three (3) specimens per test required for an average value. Testing of full units is preferred.
5. The expense of testing shall be the responsibility of the Owner.

J. In the event the shipment fails to conform to the specified requirements, the manufacturer may sort it, and new test units shall be selected at random by the Owner from the retained lot and tested at the expense of the Contractor. If the second set of test units fails to conform to the specified requirements, the entire lot shall be rejected.

2.2 BEDDING AND JOINT SAND

A. Bedding and joint sand shall be clean, non-plastic, and free from deleterious or foreign matter. The sand shall be natural or manufactured from crushed rock. Limestone screenings or stone dust shall not be used.

B. Grading of sand samples for the bedding course and joints shall be done according to ASTM C 136. The bedding sand shall conform to the grading requirements of ASTM C 33 as shown in in the following table:

Grading Requirements for Bedding Sand (*ASTM C 136)*

Sieve Size	Percent Passing
3/8 in. (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (600 µm)	25 to 60
No. 50 (300 µm)	10 to 30
No. 100 (150 µm)	2 to 10

C. The joint sand shall be equal to SuperSand Bond Polymeric Sand.

D. Concrete edging shall be as detailed on the drawings.

E. Aggregate base material shall be caliche per Section 02601.

PART 3 - INSTALLATION

3.1 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Notify the Engineer/Architect of unsatisfactory conditions. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected and the Engineer/Architect has provided written acceptance. Beginning work indicates acceptance of the site as satisfactory by the installer.

3.2 PREPARATION

A. Staking: All edges of pavement and custom logo details shall be layed out by the Contractor for approval by the Engineer/Architect. Once staking has been completed the Contractor shall notify the Engineer/Architect for staking approval prior to continuing with install.

3.3 INSTALLATION

A. Excavation: After staking approval commence excavation. The paver areas shall be excavated to the depths indicated on the drawings. Remove excavated material and dispose of off-site unless otherwise indicated on the drawings.

B. The subgrade must be compacted to at least 95% Standard Proctor Density per ASTM D698. Stabilization of the subgrade and/or base material may be necessary with weak or saturated subgrade soils. The Engineer/Architect will inspect subgrade preparation, elevations and conformance to this Section.

C. Install aggregate base material and compact to 95% Standard Proctor Density per ASTM D698. The base surface tolerance should be +/- 3/8 in. over a 10 ft. straight edge. It is imperative that the aggregate base is at the correct grade. Deficiencies in the base surface cannot be corrected with additional bedding sand or by other means.

D. Verify location, type, installation and elevations of edging around the perimeter to be paved.

E. Verify that the aggregate base is dry, uniform, even, and ready to support sand, pavers, and imposed loads.

F. Spray aggregate base with pre-emergent herbicide.

G. Spread bedding sand evenly over the base course and screed to a nominal 1 in. thickness, not exceeding 1-1/2 in. thickness. The screeded sand should not be disturbed. Place sufficient sand to stay ahead of the laid pavers. Do not use the bedding sand to fill depressions in the base surface.

H. Ensure that pavers are free of foreign materials before installation.

I. Lay the pavers in pattern as indicated on the drawings using specified paver types. Maintain straight pattern lines as indicated on the drawings. Joint (bond) lines shall not deviate more than ±1/2 in. over 50 ft. from string lines. Paving banding pattern shall be installed as indicated the drawings. For blended colors the installer shall pull from multiple pallets when creating paver pattern to mix colors.

J. Joints between pavers shall not exceed 3/16” in width. Miter cut pavers shall be used to minimize gaps and joints.

K. Fill gaps at the edges of the paved area with cut pavers or edge units.

L. Cut pavers to be cut/sawn using a masonry saw. Paver splitters shall not be used.

M. Use a low-amplitude plate compactor capable of at least minimum of 4,000 lbf (18 kN) at a frequency of 75 to 100 Hz to vibrate the pavers into the sand. Remove any cracked or damaged pavers and replace with new units.

N. Simultaneously spread, sweep and compact dry joint sand into joints continuously until full. Pavers must be dry. This will require at least 4 to 6 passes with a plate compactor. Do not

compact within three (3) feet of unrestrained edges of paving units. Ensure joint sand lies below the top of the paver.

O. Install "hidden" concrete edge restraints as shown on the drawings using minimum 2500 PSI concrete with fiber-mesh reinforcement. Sweep off excess sand. Direct a fine mist of water in the air to dampen all the joints. Dampen until there is some water retention on the paver joints. Do not walk on pavers for at least four (4) hours after the installation of the joint sand.

P. All work to within three (3) feet of the laying face must be left fully compacted with sand filled joints at the completion of each day.

Q. Do not install joint sand if rain is expected within three (3) hours of installation.

R. The final surface tolerance from grade elevations shall not deviate more than ±□3/8 in. (±10 mm) under a 10 ft (3 m) straightedge.

S. Check final surface elevations for conformance to drawings

3.4 CLEANING AND PROTECTION

A. The Contractor shall perform all necessary cleaning and removal of excess soil, debris, equipment, etc., during installation and upon completion of the work. The Contractor shall immediately repair any damage resulting from concrete unit paver installation operations without cost to the Owner.

PART 4 - METHOD OF MEASUREMENT

MEASUREMENT:

Concrete Unit Pavers as described in this Section will be paid for on a lump sum basis wherein no measurement will be made.

PART 5 - BASIS OF PAYMENT

PAYMENT:

A. Concrete Unit Pavers will be paid for at the Contract lump sum, which price will be full compensation for furnishing and installing equipment; shop drawings; providing all submittals and warranties; furnishing all labor, materials, tools, equipment; and incidentals necessary to complete the work as described in this section and related other sections of these Contract Documents, as well as maintenance until final acceptance.

END OF SECTION

SECTION 02900

LANDSCAPE PLANTING SPECIFICATION

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK AND RELATED DOCUMENTS

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation and services required and incidental thereto, as shown on the Drawings and/or specified herein including but not limited to; the procurement and transportation of living plants, the excavation and preparation of all planting beds and planting of all materials, mulching, watering, protection, maintenance guarantee period, bed edging, planting soil/mixes, fertilizer, mulch, trees, palms, shrubs, groundcovers, plant material replacements for all Contractor supplied plant materials, miscellaneous landscape materials.

B. Related Work Specified Elsewhere:

1. Clearing and Grubbing: Section 02102
2. Excavation: Section 02230
3. Irrigation: Section 02975

1.2 QUALITY ASSURANCE

A. The following Codes, Regulations, Reference Standards, and Specifications apply to work included in this section:

1. "Hortus Third," 1976.
2. Texas Association of Nurserymen, Grades and Standards for Nursery Stock
3. "American Standard for Nursery Stock," ANSI Z60.1-1900.
4. National Arborist Association Standards
5. Texas Department of Agriculture Plant Protection Regulations

B. Landscape work to be performed by a single firm specializing in commercial landscape work of similar size and quality with a minimum of five (5) years experience. The Architect shall review qualifications and approve subcontractor prior to commencing work.

1.3 WARRANTY AND MAINTENANCE

A. The Contractor shall warranty and maintain for (90) days after final acceptance, at 3in. height all new grass and existing grass inside the construction areas by mowing, weed eating and blowing debris/clippings off-site. Warranty includes groundcover/shrubs for ninety (90) days and trees/palms for one year after final acceptance. If plant material is deemed dead or unrecoverable by the Landscape Architect the Contractor will be notified in writing as such. The Contractor shall remove and replace the plant material within two weeks of the notification.

B. The Contractor shall maintain all plant material described in this Section for ninety days after written approval of substantial completion is received from the Landscape Architect.

C. Maintenance period work shall include the following tasks completed weekly:

1. Remove and replace dead plant material. Prune plants to remove dead wood and to maintain health of plants.
2. Maintain all mulched areas at a 4 in. depth. Maintain planting beds and water basins free of weeds and grass.
3. Provide insect and disease control to maintain health of plants.
4. Adjust or replace staking as required.
5. Dispose of all maintenance debris/clippings off-site. Owner's dumpsters shall not be used for disposal.
6. Keep all paved areas, walks and trails clear and free of grass clippings, mulch or other foreign materials.
7. Remove staking materials at end of maintenance period and deliver to Owner.

1.4 SUBMITTALS

A. The Contractor shall submit manufacturer's specifications for fertilizers, soil amendments, seed mixtures/percentages; all sources for plant materials; a one foot section of edging (as specified on the Drawings); and one pound bag samples each of topsoil, mulch and compost. The submittal shall include the manufacturer's name, model number, and manufacturer's installation recommendation, if applicable, for each proposed item in accordance with Section 01300.

B. No partial submittal will be accepted and submittals shall be neatly bound into a binder and logically organized. After the submittal has been approved, substitutions will not be allowed except by written consent of the Engineer/Architect.

C. Approval of the submittals are required prior to delivery of any materials to the job site.

D. Shop drawings shall include dimensions, elevations, construction details, arrangements, and capacity of equipment, as well as manufacturer's installation recommendations.

1.5 PROTECTION OF ITEMS TO REMAIN

A. Prior to commencing work the Contractor shall furnish and install orange construction fencing as indicated on the Drawings. Fencing shall be 60" in height, continuous and staked as needed to provide a stable and secure barrier around plant material. No work under this contract may begin until this fencing is in place and approved in writing by the Landscape Architect.

B. No trucks, machinery, stockpiled or staged material shall be placed or driven within the drip line of any plant material unless that drip line extends over an imperviously surfaced area. The Landscape Architect will determine if plant replacement or other repair is needed to restore the affected area to pre-construction conditions at the sole cost to the Contractor.

C. The Contractor shall adjust depth of earthwork and loaming when working immediately adjacent to any of the aforementioned features in order to prevent disturbing tree roots,

undermining walks and pavements, and damage in general to any existing or newly incorporated item.

D. Where excavating, fill or grading is required within the branch spread of trees that are to remain, the work shall be performed as follows:

1. TRENCHING: When trenching occurs around trees to remain, the tree roots shall not be cut but the trench shall be tunneled under or around the roots by careful hand digging and without injury to the roots.

2. RAISING GRADES: When the existing grade at a tree is below the new finished grade, and fill not exceeding 16 inches (16") is required, clean, washed gravel graded from one to two inches (1" - 2") in size shall be placed directly around the tree trunk. The gravel shall extend out from trunk on all sides a minimum of 18 inches (18") and finish approximately two inches (2") above the finished grade at tree. Install gravel before any earth fill is placed. New earth fill shall not be left in contact with the trunks of any trees requiring fill. Where fill exceeding 16 inches (16") is required, a dry laid tree well shall be constructed around the trunk of the tree. The tree well shall extend out from the trunk on all sides a minimum of three feet (3') and to three inches (3") above finish grade. Coarse grade rock shall be placed directly around the tree well extending out to the drip line of the tree. Clean, washed gravel graded from one to two inches (1" - 2") in size shall be placed directly over the coarse rock to a depth of three inches (3"). Approved backfill material shall be placed directly over the washed gravel to desired finished grade.

3. LOWERING GRADES: Existing trees in areas where the now finished grade is to be lowered shall have regrading work done by hand to elevation as indicated. Roots as required shall be cut cleanly three inches (3") below finished grade and scars covered with tree paint.

4. Trees that are to remain that are located more than six inches (6") above proposed grades shall stand on broad rounded mounds and be graded smoothly into the lower level. Trees located more than 16 inches (16") above proposed grades shall have a retaining structure as detailed on the Drawings, constructed a minimum of five feet (5') from the trunk. Exposed or broken roots shall be cut clean and covered with topsoil.

1.6 APPROVAL OF PLANT MATERIAL

A. All plant material shall be approved by the Landscape Architect prior to installation. At no time shall any approval impair the right of further inspection and rejection during the progress of the work or contract life for failure to conform to the listed size and condition requirements or latent defects, diseases or injuries. Rejected plant materials shall be promptly removed from the site by the Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Plant materials shall conform to the following requirements:

1. Plants shall be true to name. The standard names are those adopted by the American Joint Committee on Horticultural Nomenclature. No substitution of species or varieties shall be accepted without the written consent of the Landscape Architect.

2. Plants shall have a normal habit of growth and shall be typical of their species unless the general shape and overall character of a particular plant is specifically noted in the Plant List on the Contract Documents.

3. Plants shall be certified healthy, freshly dug, properly cured, vigorous and free from defects, decay, disfiguring roots, sun scale injuries, abrasions of the bark, plant diseases insect pests, eggs, or larvae.

4. All plants shall have been grown under climatic conditions similar to those in the locality of the project for at lease two (2) years and shall have normal healthy root systems, having been subjected to proper transplanting.

5. Plants shall not be pruned prior to delivery.

6. Balled and burlapped ("B & B") plants shall have firm, natural balls of soil of a diameter to conform to the above standards, but large enough to encompass sufficient fibrous feeding roots to insure full recovery and development of the plants. Plants grown in sand are not acceptable.

7. All precautions, which are customary in good nursery practice, shall be taken to insure the arrival of the plant material in good condition for successful growth. Plant material which arrives to the construction site poorly packed, with roots in a dry condition and/or leaves in a dehydrated condition will not be accepted.

8. All plants shall be freshly dug or properly cured if container grown. All plants shall be typical of their species or variety and shall have a normal habit of growth unless otherwise specified. Trees shall have straight trunks and all old abrasions and cuts shall be completely calloused over.

9. Plants shall have a well-developed fibrous root system.

10. Measurement: Trees and shrubs shall be measured when their branches are in normal position. Height and spread dimensions specified refer to the main body of the plant, and not from branch or root tip to tip. Caliper of trees shall be measured at D.B.H. (4.5’ above tree root flare).

11. Palms: All new palms shall be field dug or containerized material in specified sizes shown on the Contract Documents. All palms shall have good form (straight trunks) consistent of its species, free of scares/abrasions/burn marks and disease and insects, with large healthy root systems. Rootball sizes for B&B material must meet the following minimum specifications:
    a. Sabal Palms – 8”-12” greater than trunk O.D., 24” height
    b. Washingtonia Palms - 8” greater than trunk O.D., 24” height
    c. Chinese Fan, Mediterranean Fan Palms, Others - 30” diameter, 24” height

B. Fertilizer: 13-13-13 Osmocote slow release fertilizer granules or approved equal.

C. Planting tablets: Agriform (20-10-5) 21 gram slow release fertilizer tablets or approved equal.

D. Compost: Supplied by the Contractor.

E. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; minimum pH value of 6.5 and maximum 7.8; organic matter to exceed 1.5%, magnesium to exceed 100 units; phosphorus to exceed 150 units; potassium to exceed 120 units; soluble salts/conductivity not to exceed 900 ppm/0.9 mmhos/cm in soil.

F. Pesticides: Shall be a commercial grade pesticide labeled for use on the target pest and plant(s).
    1. Non-selective Herbicide: Shall be a commercial grade herbicide, such as Round-Up, or approved equal
    2. Pre-Emergent Herbicide: Shall be EPTAM granular form as manufactured by the Stouffer Chemical Company, 8582 Katy Freeway, Suite 200, Houston, Texas 77024, or Ronstar G by Rhone-Poulenc, Mounmouth Junction, New Jersey 08852, or Treflan by Elanco Products Company, a division of Eli Lilly & Co., 7040 South Alabama Street, Indianapolis, Indiana 46285, or approved equal.

G. Pesticide: Shall be a commercial grade pesticide labeled for use on the target pest and plant(s).

H. Mulch: Supplied by the Contractor.

I. Staking material:
    1. Commercial grade rubber chain-locks.
    2. Commercial grade T-Posts, 1.25 ga., 6’ Ht., green (do not drive through rootball or irrigation lines).

J. Edging:
    1. Aluminum Edging:
    2. Tree Rings or Landscape Bed Edges: Aluminum edging 3/16” (4.88 mm) wide x 4” high with a milled finish

K. Planting Mix: 75 percent sandy-loam topsoil; 25 percent premium compost; (3:1 ratio by volume); and specified fertilizer or planting tablets. Provide a mix with a uniform texture without lumps and containing no stones, sticks, roots or other foreign material.

PART 3 - INSTALLATION

3.1 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Notify the Landscape Architect of unsatisfactory conditions. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected and the Landscape Architect has provided written acceptance. Beginning work indicates acceptance of the site as satisfactory by the installer.

3.2 EXECUTION

A. Site Preparation: Compacted and/or unsuitable soils and sub-soils from planting beds must be ripped and cross-tilled to a depth of six(6) to eight(8) inches , in addition for Planting Beds preparation, amend the soil with 4" of city of McAllen compost and 2lbs of sulphur per 1,000sf until a loose, friable and free-draining condition is met. All existing weeds, grass, stabilized sub-base material, rubble, excavated soil and other material shall be removed from the site and disposed of by the Contractor prior to starting any new landscape work. Soil conditions around entire site must be approved by Landscape Architect prior to rough and finish grading operations. The Contractor shall not install any fill or topsoil in landscape areas prior to site condition approval by Landscape Architect.

B. Bed Preparation and Herbicide Application: All planting areas shall be free of weeds, grass, insects, or any other deleterious material prior to bed preparation. Contractor shall apply herbicide at least two times prior to installation of any new plants. Pre-emergent herbicide shall be applied after planting and before placement of mulch. Contractor shall follow all manufacturer's warnings and application instructions and applicable state and federal laws.

C. Planting Beds: Amend and till the soil as indicated above (3.2A) and on the plans with Compost and Sulphur.

D. Aluminum Edging: Edging shall be installed as shown on the Drawings. Edging shall allow for tapered drainage points to ensure free drainage away from all structures and walkways. Edging shall be set flush with adjacent paving, sidewalks or driveways. Aluminum edging is to lock together with no offset or overlap at the joints. Install with 5 stakes per 16' section. Stakes are to be installed ½" below top edge, out of view. At all start and stop points, install end stake adapters to properly secure these critical areas.

E. Turf Areas: Scarify, float and fine grade all areas to receive sod or hydromulch for approval by Landscape Architect prior to placement of sod or application of hydromulch. Supply additional topsoil as necessary to fill any/all low areas and ensure positive drainage away from planting beds.

F. Planting Operations:

1. Installation:
    a. Excavate planting pit to depth and width indicated on Contract Documents.
    b. Set root ball on puddle/settled bottom of planting pit. Remove burlap, rope, wire, and all other wrapping material from top of ball. Completely remove any binding rope which is not biodegradable.
    c. Fill planting pit 2/3 full with planting mix, soak with water and allow to settle, and add fertilizer tablets as detailed. Finish filling pit with planting mix and tamp lightly. Do not place fertilizer tablets at bottom of planting pit.
    d. Construct a watering basin as detailed on the Drawings and described below. Water-in to completely saturate the root ball and planting mix. Add planting mix where any settling or air pockets occur and saturate with water.
    e. Stake all trees/palms immediately after planting as detailed. Staking to be maintained throughout the maintenance period.
    f. Palms: New Washingtonia palms shall be cleaned (skinned) completely of their leafstem bases and fibers to a height 4 feet below the crown. Sabal palms shall be planted with their leafstem bases remaining but cleaned and trimmed evenly. All palms shall be planted with several petioles or fronds tied up straight with natural twine. Remaining fronds shall be trimmed leaving a minimum of 9 fronds to lighten wind load on terminal bud. Contractor is responsible for removing or cutting the twine supporting the fronds as directed by the Landscape Architect.

G. Watering Basins: Watering basins for all trees/palms shall be constructed in a ring shape around each tree or palm trunk. This earthen berm shall be constructed 6” in height and 48” in diameter so as to hold water and allow infiltration around root ball. A minimum of 4 inches of cypress mulch shall be placed within the watering basin. Watering basins must be maintained and kept free of weeds during the entire maintenance period. No mulch shall come in contact with the tree trunk.

H. Pruning Operations:

1. After planting, the branches of deciduous stock shall be pruned to balance the loss of roots while retaining the natural form of the plant type according to best horticultural practice.

2. Trees shall be pruned by removing all dead wood, all surplus, badly formed and interfering limbs. In general, 1/5 of the branches shall be removed but the proportion shall, in all cases, be subject to the approval of the Landscape Architect. Broken, damaged and unsymmetrical branches shall be removed or cut back to ensure healthy and symmetrical growth of new wood. In the case of multiple leaders, the one which will best promote the symmetry of the trees shall be preserved and the remainder shall be removed or cut back so that they will not compete with the selected leader. Surrounding top branches shall be cut back to conform to the leader trimming. Branches to be cut back shall be cut off at the point beyond a lateral shoot or bud a distance of not less than 1/2 the diameter of the supporting branch. The cut shall be made on an angle slopping in the

direction of the lateral shoot and in no case shall stubs be left. All cut surfaces over one inch in diameter shall be painted with tree wound dressing.

I. During excavation, material suitable for backfilling shall be stockpiled in an orderly manner a sufficient distance back from edge of trenches to avoid overloading and prevent slides or cave-ins. Material unsuitable for backfilling shall be wasted as directed by the Landscape Architect. When excavated material is of a rocky nature and the topsoil or any other layer of excavated material is suitable for pipe bedding and backfill in the vicinity of the pipe, such material shall be separately stockpiled for use in such bedding and pipe backfill operations, unless satisfactory imported material is used. All deleterious material must be removed from the site by the Contractor.

J. All excavations and backfill shall be unclassified and covered in the base bid. No additional compensation will be allowed for rock or rubble encountered.

K. Restore all surfaces, existing underground installations, etc., damaged or cut as a result of the excavations to their original conditions in a manner acceptable to the Landscape Architect.

3.3 CLEANING AND PROTECTION

A. The Contractor shall perform all necessary cleaning and removal of excess soil, debris, equipment, etc., during installation and upon completion of the work. The Contractor shall immediately repair any damage resulting from planting operations without cost to the Owner.

B. The Contractor shall protect landscape plants from damage or theft until final acceptance.

P**ART 4 - METHOD OF MEASUREMENT**

MEASUREMENT:

Landscape planting as described in this section will be paid for on a Line Item basis. Where in no measurement will be made.

PART 5 - BASIS OF PAYMENT

PAYMENT:

A. Landscape Planting will be paid for at the Line Item unit price, which price will be full compensation for furnishing and installing plant materials; shop drawings; providing all submittals and warranties; furnishing all labor, materials, tools, equipment; and incidentals necessary to complete the work as described in this section and related other sections of these Contract Documents, as well as maintenance until final acceptance.

END OF SECTION 02900

SECTION 02920

LANDSCAPE MULCH

PART 1 GENERAL

1.1 The Work under this Section consists of all labor, equipment, and materials necessary to place mulch after planting to help inhibit weed growth, conserve soil moisture, and reduce soil erosion. All Work shall be in accordance with these Specifications and shall be placed at the locations shown on the Drawings

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Landscape Planting: Section 02900

1.2 QUALITY ASSURANCE:

A. The following Standards apply to work included in this section
B. U.S. Composting Council Seal of Testing Assurance Program
C. Non-toxic, biodegradable and contaminant-free recycle Green-waste.

PART 2 MATERIALS

A. Compost mulch shall be a well decomposed, weed free organic matter source. It shall be derived from: agriculture, food, or industrial residuals: biosolids (treated sewage sludge); yard trimmings: or source-separated waste. The product shall contain no substances toxic to plants and be reasonable free (< 1% by dry weight) of man-made foreign matter. The compost will possess no objectionable odors and shall not resemble the raw material from which it was derived. For acid loving plants, only use a compost that has not received the addition of limiting agents or ash by-products. The product shall be certified through the U.S. Composting Council's (USCC) Seal of Testing Assurance(STA) Program.

   When using compost for mulching, specific products may be considered more physically or visually acceptable for a given planting area. A representative sample of compost must be submitted to the Landscape Architect prior to field use since eesthetic preferences are subjective. Coarser-textured compost mulches are more effective in reducing weed growth and preventing water and wind erosion.

Product Parameters*:

Parameters	Reported as	General Range
pH2	pH units	5.5 – 9.0
Soluble Salt Concentration2 (electrical conductivity)	dS/m (mmhos/cm)	Maximum 10
Moisture Content	% wet weight basis	25 - 60
Organic Matter Content	% wet weight basis	>30
Particle Size	% passing a selected mesh size, dry weight basis	99% pass through 3" screen, >25% passing 3/8" screen
Physical Contaminants (inerts)	%, dry weight basis	<0.1
Chemical Contaminants	Mg/kg (ppm)	Meet or exceed US EPA Class A standard, 40 CFR 503.13, Tables 1 and 3 levels
Biological Contaminants Select Pathogens Fecal Coliform Bacteria or Salmonella	 MPN per gram per dry weight MPN per gram per dry weight	 Meet or exceed US EPA Class A standard, 40 CFR § 503.32(a) levels

1. Recommended test methodologies are provided in Test Methods for the Examination of composting and Compost(TMECC, The US Composting Council)
2. It should be noted that the pH and soluble salt content of the amended soil mix is more relevant to the establishment and growth of a particular plant, than is the pH or soluble salt content of a specific compost (soil conditioner) used to amend the soil. Each specific plant species requires a specific pH range. Each plant also has a salinity tolerance rating, and maximum tolerable quantities are known. Most ornamental plant and turf species can tolerate a soil/media soluble salt level of 2.5 dS/M and 4 dS, respectively. Seeds, young seedlings and salt sensitive species often prefer soluble salt levels at half the afore mentioned levels. When specifying the establishment of any plant or turf species, it is important to understand their pH and soluble salt requirements, and how they relate to existing soil condtions.
3. US EPA Class A standard, 40 CFR §503.13 Tables 1 and 3 levels = Arsenic 41ppm, Cadmium 29ppm, Copper 1.500ppm, Lead 300ppm, Mercury 17ppm, Molybdenum 775ppm, Nickel 520ppm, Selenium 100ppm, Zinc 2,800ppm.
4. S EPA Cloass A standard, 40 CFR §503.32(a) levels = Salmonella <3MPN/4grams of total solids or Fecal Coliform <1000 MPN/gram of total solids.
5. Landscape Architects and Project (field) engineers may modify the allowable compost specification ranges based on specific field conditions and plant requirements.

*Before delivery of the compost, supplier must provide a copy of the lab analysis, performed by a STA Program certified lab, verifying that the compost meets the product parameters listed above. The lab analysis should not be more than 90 days old.

Verifying current participation in the STA Program can also be achieved by logging onto the USCC website at www.compsotingcouncil.org

PART 3 EXECUTION

3.01 LANDSCAPE MULCH INSTALLATION

A. Compost mulch shall be uniformly applied to a depth 4” inches as soon as possible after weed removal and planting.
B. Avoid placing mulch against the trunk or stem of any plant material.
C. Water thoroughly before and after mulching to saturate the root zone and entire mulch layer.
D. All stones, roots, or other debris shall be removed from the surface of the mulched area.

PART 4 MEATHOD OF MEASUREMENT

4.01 Landscape Mulch will be measured by the cubic yard or the ton at the point of loading.

PART 5 BASIS OF PAYMENT

5.01 Landscape Mulch will be paid for at the Line Item unit price, which price will be full compensation for full compensation for furnishing and installing equipment, shop drawings; providing all submittals and warranties, furnishing all labor, materials, tools, equipment; and incidentals necessary to complete the work as described in this section and related other sections of these contracts documents, as well as maintenance until final acceptance.

January 14, 2014

SECTION 02921

COMPOST AS A LANDSCAPE BACKFILL MIX COMPONENT

PART 1: GENERAL

1.1 This Work under this Section consists of all labor, equipment, and materials necessary to excavate a planting bed/hole and blend compost with the excavated soil to improve soil quality and plant growth. This specification applies to all types of plant material. All Work shall be in accordance with these Specifications and shall be placed at the locations shown on the Drawings

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Landscape Planting: Section 02900

1.3 QUALITY ASSURANCE:

A. The following Standards apply to work included in this sections
B. U.S. Composting Council Seal of Testing Assurance Program

PART 2: MATERIALS

A. Compost shall be a well decomposed, weed free organic source. It shall be derived from: agriculture, food, or industrial residuals: biosolids (treated sewage sludge); yard trimmings: or source-separated or mixed solid waste. The product shall contain no substances toxic to plants and be reasonable free (< 1% by dry weight) of man-made foreign matter. The compost will possess no objectionable odors and shall not resemble the raw material from which it was derived. For acid loving plants, only use a compost that has not received the addition of limiting agents or ash by-products. The product shall be certified through the U.S. Composting Council's(USCC) Seal of Testing Assurance(STA) Program.

B. Compost containing available nutrients, primarily nitrogen, are preferred, while the use of unstable or immature compost is not approved. Care should be given when using compost possessing a basic pH(>7) near acid loving plants. A pH adjustment of the finished soil/compost mix may be necessary.

Product Parameters*:

Parameters	Reported as	General Range
pH[2]	pH units	6.0 – 8.5
Soluble Salt Concentration[2] (electrical conductivity)	dS/m (mmhos/cm)	Maximum 10
Moisture Content	% wet weight basis	30 - 60
Organic Matter Content	% wet weight basis	30 - 65
Particle Size	% passing a selected mesh size, dry weight basis	98% pass through ¾" screen or smaller
Stability[3] Carbon Dioxide Evolution Rate	Mg CO_2"C per g OM per day	<8
Maturity[3] (Bioassay) Seed Emergence and Seedling Vigor	%, relative to positive control %, relative to positive control	Minimum 80% Minimum 80%
Physical Contaminants (inerts)	%, dry weight basis	<1
Chemical Contaminants[4]	Mg/kg (ppm)	Meet or exceed US EPA Class A standard, 40 § 503.13, Tables 1 and 3 levels
Biological Contaminants[5] Select Pathogens Fecal Coliform Bacteria, or Salmonella	MPN per gram per dry weight MPN per 4 gram per dry weight	Meet or exceed US EPA Class A standard, 40 CFR § 503.32(a) levels

1. Recommended test methodologies are provided in Test Methods for the Examination of composting and Compost(TMECC, The US Composting Council)
2. It should be noted that the pH and soluble salt content of the amended soil mix is more relevant to the establishment and growth of a particular plant, than is the pH or soluble salt content of a specific compost (soil conditioner) used to amend the soil. Each specific plant species requires a specific pH range. Each plant also has a salinity tolerance rating, and maximum tolerable quantities are known. Most ornamental plant and turf species can tolerate a soil/media soluble salt level of 2.5 dS/M and 4 dS, respectively. Seeds, young seedlings and salt sensitive species often prefer soluble salt levels at half the afore mentioned levels. When specifying the establishment of any plant or turf species, it is important to understand their pH and soluble salt requirements, and how they relate to existing soil conditions
3. Stability/Maturity rating is an area of compost science that is still evolving, and as such, other various test methods could be considered. Also, never base compost quality conclusions on the result of a single stability/maturity test.
4. US EPA Class A standard, 40 CFR 503.13 Tables 1 and 3 levels = Arsenic 41ppm, Cadmium 29ppm, Copper 1.500ppm, Lead 300ppm, Mercury 17ppm, Molybdenum 775ppm, Nickel 420ppm, Selenium 100ppm, Zinc 2,800ppm.
5. US EPA Class A standard, 40 CFR 503.32(a) levels = Salmonella <3MPN/4grams of total solids or Fecal Coliform <1000 MPN/gram of total solids.
6. Landscape Architects and Project (field) engineers may modify the allowable compost specification ranges based on specific field conditions and plant requirements.

*Before delivery of the compost, supplier must provide a copy of the lab analysis, performed by a STA Program certified lab, verifying that the compost meets the product parameters listed above. The lab analysis should not be more than 90 days old.

Verifying current participation in the STA Program can also be achieved by logging onto the USCC website at www.compsotingcouncil.org

PART 3: EXECUTION

3.01 COMPOST INSTALLATION

A. Compost shall be uniformly applied over the planting area at an average depth 4" inches as soon as possible after weed removal and planting.
B. Incorporate uniformly to depth of 6-8" inches using a rotary tiller or other appropriate equipment. Lower compost application rates may be necessary where composts possessing higher salt levels are used.
C. Pre-plant fertilizer and pH adjusting agents (e.g. lime and sulfur) may be applied in conjunction with compost incorporation and necessary.
D. Rake soil surface smooth prior to planting.
E. The soil surface shall be reasonably free of large clods, roots, stones greater than 2 inches, and other material which will interfere with planting and subsequent site maintenance.
F. Water thoroughly after planting.

PART 4 MEATHOD OF MEASUREMENT

4.01 Compost will be measured by the cubic yard at the point of loading.

Soil Analysis: Before any soil preparation procedures ensue, a soil analysis shall be completed by a reputable laboratory to determine any nutritional requirement, pH and organic matter adjustments necessary. Once determined, the soil shall be appropriately amended to a range suitable for the turf species to be established.
The landscape architect shall specify the compost inclusion rate depending upon soil conditions and qualify, plant tolerances, and manufacturer's recommendations. The use of stable, nutrient rich compost will reduce initial fertilizer requirements by the amount of available nutrients in the compost.

PART 5 BASIS OF PAYMENT

5.01 Compost will be paid for at the Line Item unit price, which price will be full compensation for furnishing and installing equipment, shop drawings; providing all submittals and warranties, furnishing all labor, materials, tools, equipment; and incidentals necessary to complete the work as described in this section and related other sections of these contracts documents, as well as maintenance until final acceptance.

January 14, 2014

SECTION 02935
GRASS SEEDING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK AND RELATED DOCUMENTS

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation and services required and incidental thereto, as shown on drawings and/or specified herein including but not limited to; seed bed preparation, fertilization, installation and uniform establishment of seeded hydromulch.

B. Related Work Specified Elsewhere:

1. N/A.

C. It is the responsibility of the Contractor to establish a Bermuda Grass lawn. City representative will assess and be satisfied with the application of seed or seeded materials (hydromulch). The General Contractor will be responsible for the initial watering at both sites and for two more watering cycles four (4) days apart.

1.2 QUALITY ASSURANCE

A. All chemical applications shall be performed in accordance with current county, state, and federal laws, utilizing approved materials and methods of application.

B. All seed must meet the requirements of the U.S. Department of Agriculture Rules & Regulations as set forth in the Federal Seed Act and the Texas Seed Law.

C. Suspend all work in this Section if methods of consistent watering are nonexistent, conditions of excessive moisture, high winds or extreme or prolonged cold exist.

1.3 MAINTENANCE AND WARRANTY

Reapply seed, hydromulch as necessary to achieve uniform coverage.

A. Seed shall be fresh, clean, new crop seed certified by the Texas Department of Agriculture and free of weeds and disease. Apply uniformly at the following rates for type of seed and planting date:

TYPE	APPLICATION RATE POUNDS/AC	SEEDING DATE
Hulled Common Bermuda	40	March 1 to March 31

Grass 98/88 Unhulled Common Bermuda Grass 98/88	40	
Hulled Common Bermuda Grass 98/88	40	April 1 to September 30
Hulled Common Bermuda Grass 98/88 Unhulled Common Bermuda Grass 98/88 Annual Rye Grass (Gulf)	40 40 30	October 1 to February 28

B. Wetting agent shall be potable water.

PART 3 - INSTALLATION

3.1 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Notify the Engineer/Architect of unsatisfactory conditions. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected and the Engineer/Architect has provided written acceptance. Beginning work indicates acceptance of the site as satisfactory by the installer.

3.2 INSTALLATION – HYDROMULCH

A. Prior to commencement of hydromulch operations, the Contractor shall protect all stationary items from overspray. Any overspray shall be immediately removed from any stationary object while still wet.

B. The Contractor shall obtain approval of hydromulch area from Engineer/Architect prior to application. Immediately after approval begin hydromulch application to reduce potential for erosion and excessive weed growth.

C. Water, for watering purposes, shall be the responsibility of the Contractor. The Contractor shall provide equipment needed to connect to source, transport and distribute water, and for procuring temporary water meter from Owner.

3.3 INSTALLATION – SEEDING

A. The Contractor shall obtain approval of seed bed area from Engineer/Architect prior to application. Immediately after approval begin broadcast seed application to reduce potential for erosion and excessive weed growth.

B. Soil shall be moist, but not wet.

3.4 CLEANING – PROTECTION - MAINTENANCE

A. The Contractor shall perform all necessary cleaning and removal of excess soil, debris, equipment, etc., during installation and upon completion of the work. The Contractor shall immediately repair any damage resulting from turf establishment operations without cost to the owner. Contractor will maintain for (90) days at 3in. height all new grass and existing grass inside the construction areas by mowing, weed eating and blowing debris/clippings off-site. This work will be at no additional cost to owner.

END OF SECTION

SECTION 02945

LANDSCAPE EDGING

PART 1: GENERAL

1.1 The Work under this Section consists of all labor, equipment, and materials necessary to place landscape edging. All Work shall be in accordance with these Specifications and shall be placed at the locations shown on the Drawings

1.2 WARRANTY

15-year limited material warranty for landscape edging from manufacturing defects in workmanship or material.

PART 2: PRODUCTS

2.1 PLANTING ACCESSORIES

A. Medium Duty Straight Profile Edging: Permaloc ProLine, 1/8\" (3.2mm) x 4\" (102mm) high, extruded aluminum, 6063 alloy, T-6 hardness, landscape edging for straight-line and curvilinear applications in corrugated straight profile, as manufactured by Permaloc Corporation, or comparable product by other manufacturers will be considered provided complete supporting data from the manufacturer is submitted to the Architect. Section shall have loops on side of section to receive stakes spaced approximately 2 to 3 feet (610 mm to 915 mm) apart along its length.

B. Thickness: 1/8 inch (3.2 mm) gage section at 0.050 inch (1.27 mm) minimum thick with 0.125 inch (3.18 mm) exposed top lip.

C. Length: sections.

D. Connection Method: Section ends shall splice together with an interlocking stakeless snap-down design.

E. Stake: 12\" (305mm) Permaloc extruded aluminum stake. Stakes to interlock into section loops.

F. Finish: Green DuraFlex Painted. Paint finish shall comply with AAMA 2603 for electrostatically baked on paint.

PART 3: EXECUTION

3.01 LANDSCAPE EDGING INSTALLATION

Actual article number will be determined by location within the Part 3 portion of specification.

A. Preparation: Ensure that all underground utility lines are located and will not interfere with the proposed edging installation before beginning work. Locate border line of edging with string or other means to assure border straightness and curves as designed. Dig trench 1 inch (25 mm) deeper than set of edging bottom.

B. Set edging into trench with top at 1/2 inch (12.7 mm) above compacted finish grade on turf side with side having loops for stakes placed on opposite side of turf. Drive stakes through edging loops until locked in place. Requires 5 stakes evenly spaced for each 16 feet (4.88 meters) section, or 3 stakes evenly spaced for each 8 feet (2.44 meters) section with a total of 8 stake loops available in each 16 feet (4.88 meters) section if necessary. Provide additional stakes at approximately 24 inches apart, longer stakes, heavier gage stakes, or any combination of previously mentioned as necessary to firmly secure edging for permanent intended use.

C. Where edging sections turn at corners and at angled runs, cut edging partially up through its height from bottom and turn back to desired angle to form rounded exposed radius.

D. Backfilling and Cleanup: Backfill both sides of edging, confirm and adjust if necessary that sections are securely held together, and compact backfill material along edging to provide top of edging at 1/2 inch (12.7 mm) above turf finish grade. Cleanup and remove excess material from site.

July 1, 2008

END OF SECTION

SECTION 02975

LANDSCAPE IRRIGATION SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK AND RELATED DOCUMENTS

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation, point of connection and all other services required for the installation of a complete underground permanent irrigation system, as shown on the Drawings and/or specified herein.

B. Related Work Specified Elsewhere:

1. Trench Excavation, Backfill, Compaction: Section 02221
2. Excavation: Section 02230
3. Landscaping: Section 02950.

1.2 QUALITY ASSURANCE

A. The following Codes, Regulations, Reference Standards, and Specifications apply to work included in this section: ASTM: D2241, D2464, D2466, D2564, and D855. Texas Administrative Code Chapter 344.

B. The utilities shown on the Drawings are shown schematically and are for the Contractor's reference. The Contractor must field verify the location of all utilities.

1.3 WARRANTY AND MAINTENANCE

A. The Contractor shall warranty material and workmanship for one year after final acceptance including repair and replacement of defective materials, workmanship, and labor.

B. Maintenance during warranty shall include, but not necessarily be limited to, the following:

1. Adjustment of sprinkler height and plumb to compensate for settlement and/or plant growth.
2. Backfilling of all trenches.
3. Adjustment of head coverage (arc of spray) as necessary.
4. Unstopping heads and valves plugged by foreign material.
5. Drip System:
   a. Remove disc stack and rinse with water and replace every 6 months.
   b. Compare the controller runtimes and frequency to the application rate for Techline CV at the spacing used. If the amount of water in inches/hour is insufficient or exceeds the requirement of the plant, adjust accordingly.
   c. Refer to "Techline Design Manual" by Netafimusa.com.
6. Adjustment of controller as necessary to insure proper sequence and watering time.
7. All maintenance necessary to keep the system in good operating order. Repair of damage caused by vandals, other contractors or weather conditions shall be considered extra to these Specifications.

C. Warranty and maintenance after final acceptance does not include alterations as necessitated by re-landscaping, re-grading, addition of trees or the addition, and/or changes in sidewalks, walls, driveways, etc.

1.4 SUBMITTALS

A. The Contractor shall submit shop drawings or manufacturer's "cut sheets" for each type of sprinkler head, pipe, controller, valves, check valve assemblies, valve boxes, wire, conduit, fittings, drip irrigation lines and components, and all other types of fixtures and equipment proposed. The submittal shall include the manufacturer's name, model number, equipment capacity, and manufacturer's installation recommendation, if applicable, for each proposed item.

B. No partial submittal will be accepted and submittals shall be neatly bound into a binder and logically organized. After the submittal has been approved, substitutions will not be allowed except by written consent of the Engineer/Architect.

C. Shop drawings shall include dimensions, elevations, construction, details, arrangements, and capacity of equipment, as well as manufacturer's installation recommendations.

1.5 "APPROVED EQUAL" SUBSTITUTIONS

Several items in this section and on the Drawings are specified by a manufacturer's brand name and catalog number, followed by the phrase "or approved equal". This is not intended to unduly restrict competitive procurements or bidding, but is done to assure a minimum standard of quality which is believed to be best for the item specified.

1.6 CODES/PERMITS

A. All work under this section shall comply with the provisions of these Specifications, as illustrated on the accompanying drawings, or as directed by the Engineer/Architect and shall satisfy all applicable local, state and federal codes, ordinances, or regulations.

B. Installation of equipment and materials shall be done in accordance with requirements of the National Electrical Code, City Plumbing Code, and standard plumbing procedures. The contract Documents are intended to comply with all the necessary rules and regulations; however, some discrepancies may occur, the Contractor shall immediately notify the Engineer/Architect in writing of the discrepancies and apply for an interpretation. Should the discovery and notification occur after the execution of a contract, any additional work required for compliance with the regulations shall be paid for as covered by these Contract Documents.

C. The Contractor shall give all necessary notices, obtain all permits, and pay all costs in connection with his work; file with all governmental departments having jurisdiction; obtain all required certificates of inspection for his work and deliver to the Engineer/Architect.

D. The Contractor shall include in the work any labor, materials, services, apparatus, or drawings in order to comply with all applicable laws, ordinances, rules and regulations whether or not shown on the drawings and/or specified.

E. The installation of the irrigation system shall be made by an individual or firm duly qualified with a minimum of five years experience installing systems of similar size and scope, and licensed under Article No. 8751 VTCS, Titled "Licensed Irrigators Act", S.B. No. 259 as passed by the 66th Texas Legislature, and amended.

1.7 EXISTING UTILITIES

A. Locations and elevations of various utilities included with the scope of this work have been obtained from the most reliable sources available and should serve as a general guide without guarantee to

accuracy. The Contractor shall examine the Site and verify to his own satisfaction the locations and elevation of all utilities and availability of utilities and services required. The Contractor shall inform himself as to their relation to the work and the submission of bids shall be deemed as evidence thereof. The Contractor shall repair at his own expense, and to the satisfaction of the Engineer/Architect, for damage to any utility shown or not shown on the Drawings.

B. Should utilities not shown on the Drawings be found during excavations, the Contractor shall promptly notify the Engineer/Architect for instructions as to further action.

C. The Contractor shall make necessary adjustments in the layout as may be required to connect to existing stub-outs, should such stub-outs not be located exactly as shown and as may be required to work around existing work, at no increase in cost to the Owner. All such work shall be recorded on As-Built drawings and turned over to the Engineer/Architect prior to Final Acceptance.

1.8 RETRO-FIT

A. Various locations marked "RETRO-FIT" on the plan includes:

1. Sprinkler pressure line re-routing (do not exceed pipe flows greater than 5fps).
2. Existing gate valves, controllers, control valves and drip irrigation shall be repaired, replaced and or re-routed in the field to best fit properties impacted.
3. Follow all installation details shown on the irrigation detail sheet.
4. All adjustments made to other property owner's irrigation systems shall be approved in writing by all parties impacted (BEFORE COMENCING ANY WORK).

1.9 AS-BUILT DRAWINGS

A. Record dimensioned locations and depths for each of the following:

1. Point of connection to proposed backflow device as shown on the Drawings.
2. Sprinkler pressure line routing (provide dimensions for each 100 lineal feet along each routing, and for each change in direction).
3. Gate valves.
4. Sprinkler control valves (buried only).
5. Control wire routing.
6. Drip irrigation assemblies.
7. Other related items as may be directed by the Engineer/Architect.

B. Locate all dimensions from two permanent points (buildings, monuments, sidewalks, curbs, or pavements).

C. Record all changes which are made to the Drawings, including changes in the pressure and non-pressure lines.

D. Record all required information in and AutoCAD 2005, or better, file. Do not use this file for any other purpose.

E. Maintain information daily. Keep a set of Drawings at the Site at all times and available for review by the Engineer/Architect.

F. When as-built drawings have been approved by the Engineer/Architect, transfer AutoCAD file to a CD and provide a bond copy of the final as-built drawings. Changes using ball-point pen are not acceptable. Make dimensions accurately at the same scale used on original Drawings, or larger. If photo reduction is required to facilitate controller chart housing, notes or dimension must be a minimum 1/4 inch in size.

1.10 CONTROLLER CHART

A. Do not prepare chart until as-built drawings have been approved by the Engineer/Architect.

B. Provide one controller chart for the stations used on the automatic controller(s).

1. Chart may be a reproduction of the as-built drawing, if the scale permits fitting within the controller door. If photo reduction prints are required, keep reduction to maximum size possible to retain full legibility.
2. Chart shall be blackline print of the actual system, showing the area covered by that controller.

C. Identify the area of coverage of each remote control valve, using a distinctly different pastel color, drawn over the entire area of coverage.

D. Following approval of chart by the Engineer/Architect, it shall be hermetically sealed between two layers of 20 mil. Thick plastic sheet.

E. Chart must be completed and approved prior to final acceptance of the irrigation system.

1.11 OPERATING AND MAINTENANCE MANUALS

A. Provide four (4) individually bound manuals detailing operating and maintenance requirements for irrigation systems.

B. Manuals shall be delivered to the Engineer/Architect for review and approval no later than 10 days prior to completion of work. Revise manual as required.

C. Provide descriptions of all installed materials and systems in sufficient detail to permit maintenance personnel to understand, operate, and maintain the equipment.

D. Provide the following in each manual:

1. Index sheet, stating Irrigation Contractor's name, address, telephone number, and name of person to contact.
2. Duration of guarantee period and effective dates.
3. Equipment list providing the following for each item:
   a. Manufacturer's name.
   b. Make and model number.
   c. Name and address of local manufacturer's representative.
   d. Spare parts list in detail.
   e. Detailed operating and maintenance instructions of major equipment.
4. Recommended programs for watering by season.
5. Copies of all permits, filings with governmental jurisdictions and certificates of inspection.

1.12 CHECKLIST

A. Provide a signed and dated checklist, and deliver to the Engineer/Architect prior to final acceptance of the work.

B. Use the following format:

1. Permits: issue date
2. Inspections: sign-off date
3. Material approvals: approved by and date.
4. Pressure line tests: by whom and date.

4. As-built Drawings: received by and date.
6. Controller charts: received by and date.
7. Materials furnished: received by and date.
8. Operation and maintenance manuals: received by and date.
9. System and equipment operation instructions: received by and date.
10. Manufacturer's warranties: received by and date.
11. Written guarantee: received by and date.
12. Lowering of heads in lawn areas: if incomplete, so state.

1.13 ELECTRIC POWER

Electric power to operate the controller shall be furnished by the Electrical Contractor unless otherwise noted on the Drawings. Service wiring to the controller cabinet shall be furnished by the Contractor and comply with all applicable codes.

1.14 WATER FOR TESTING

Unless noted otherwise on the Drawings or elsewhere, water is available on the site necessary for testing, flushing, and jetting.

1.15 BORINGS, SLEEVES AND ELECTRICAL CONDUITS

Sleeves and electrical conduits are the responsibility of the Contractor to install prior to paving or related construction and should be installed as noted on the Drawings. The Contractor shall be responsible for locating all sleeves and conduits at no additional cost to the Owner. Borings under existing paving will be required where noted on the drawings and shall be provided at no additional cost to the Owner. Borings shall be a minimum of 18 inch depth and new pipes shall be encased in Schedule 40 PVC sleeves.

1.16 POINT OF CONNECTION

A. The Contractor shall verify main, meter location, and water pressure at the site. If minimum static daytime water pressure is less than required, notify Engineer/Architect prior to construction. Contractor shall notify the Engineer/Architect of such and shall receive owners' approval prior to any construction.

B. Follow all state and local codes.

PART 2 - PRODUCTS

2.1 GENERAL

Unless otherwise noted on the Drawings, all materials shall be new and unused. The irrigation equipment catalog numbers used for reference in these Specifications are to establish minimum quality standards and may be substituted with an "approved equal" as outlined in Paragraph 1.06 of this section, unless specifically requested by the Owner.

2.2 POLYVINYL CHLORIDE PIPE (PVC PIPE)

PVC pipe manufactured in accordance with ASTM Standards noted herein.

A. Marking and Identification: PVC pipe shall be continuously and permanently marked with the following information: Manufacturer's name, size, type of pipe, and material, PVC number, Product Standard number, and the NSF (National Sanitation Foundation) Seal.

B. PVC pipe fittings: Shall be of the same material as the PVC pipe specified and compatible with PVC pipe furnished. Solvent weld type shall be for Schedule 40.

C. PVC Pipe: Lateral line pipe shall be Class 200 solvent weld, SDR-21, PS 22-70 for all sizes 3/4" - 2". Mainline pipe shall schd.40 PVC, unless otherwise noted on the Drawings.

D. Flexible PVC Risers (Nipples): All flexible PVC nipples shall be made from virgin PVC material, and shall comply with ASTM D2287, shall be tested at 200 P.S.I. static pressure for 2 hours and have a quick burst rating of a minimum 400 P.S.I. Flexible PVC pipe nipples shall be factory assembled only.

E. Unless otherwise noted on the Drawings, no pipe smaller than ¾" shall be used.

2.3 SWING JOINTS

Swing joints shall be O-ring seal type. Use Lasco, KBI or approved equal.

2.4 WIRE AND SPLICES

A. All electrical, control and ground wire shall be of size as indicated on the Drawings or in these Specifications. All wiring to be used for connecting the automatic remote control valve to the automatic controllers shall be Type "UF" 600 volt, solid copper, single conductor wire with PVC insulation and bear UL approval for direct underground burial feeder cable.

B. Verification of wire types and installation procedures shall be checked to conform to local codes.

C. Wire connectors shall be King low voltage connectors, tan color.

D. No. 14 UF Direct Burial Cable

1. Conductor: Soft-annelaed copper conforming to UL std. 719, Parts 18-22.
2. Insulation: Polyvinylchloride, 60 degree C rated, conforming to UL std. 719, Parts 23-25.
3. Manufacturer's Identification: Surface embossed with manufacturer's name, voltage rating, size and type of designation.
4. Underwriter's Laboratories Approval: All cable shall be tested physically and electrically in accordance with UL std. 719, and shall bear UL labels.

E. No. 10/2 UF Direct Burial Cable:

1. Conductors: The conductors shall consist of solid, soft-annealed copper.
2. Insulation: Over each conductor, there shall be extruded a polyvinylcholoride compound, UL rated for 60 degrees CENTIGRADE.
3. Color Coding: In conformance with the National Electrical Code.
4. Assembly: Flat, parallel configuration.
5. Overall Sheath: A polyvinylchloride sheath compound conforming to UL 719, for "UF" cable shall be applied overall.

F. Ground: The ground conductor shall consist of solid, uncoated soft-annealed No. 6 copper wire.

2.5 MANUAL/ISOLATION VALVES

A. All isolation valves 2-1/2 inches and larger shall be resilient wedge gate valve as manufactured by Matco-Norca series 10RT. All isolation valves smaller than 2-1/2" shall be Speers PVC, double union ball valves or approved equal. All valves must be certified for a working pressure of 125 PSI with a hyrdrostatic shell test of 200 PSI and a hydrostatic seal test of 150 PSI. Both ends must be screw type for use with PVC pipe.

B. All isolation valves shall be housed in an appropriately sized valve box.

2.6 ELECTRIC REMOTE CONTROL VALVES

A. All electric valves shall be “normally closed”, solenoid operated, 24 volt A.C., 60 Hz., Globe-Angle or Globe type valve installed in the angle or globe configuration.

B. Valves shall be Weathermatic 2100, Pressure Regulating (XPR), Series, unless otherwise indicated on the Drawings.

C. A flow stem adjustment shall be included in each valve.

2.7 VALVE BOXES – ARMOR

A. All electrical valves shall be placed below grade within 10” round valve boxes. Valve boxes shall be Armor Model No. 181104 with matching green bolt down or locking cover marked “Irrigation Control Valve,” or approved equal.

B. All isolation shut-off valves shall be installed in suitable valve access boxes or proper size as required for easy access to the valve. Valve boxes shall be Armor Model No. 181104 (minimum size), with matching green bolt down or locking cover marked “Irrigation Control Valve,” or approved equal.

C. A valve box shall be provided for all valves.

D. Boxes shall be suitable in size and configuration for the operability and adjustment of the valve.

E. Extension sections will be used as appropriate to the depth of piping.

F. All valve box covers shall bolt down or have locking mechanisms and shall be colored green.

2.8 POP-UP SPRAY, MICRO SPRAY, ROTOR AND BUBBLER HEADS

A. Pop-up spray, rotor and bubbler heads are specified on the Drawings.

B. One adjustable bubbler head shall be provided per each tree location as shown on the Drawings.

C. Spray heads shall have a minimum 4" pop-up or 12” pop-up as designated on the Drawings. The sprinkler body and all related parts shall be plastic cycolac or polycarbonate. They shall have a spring retraction for positive return action of the pop-up nozzle. The spring for retraction and the adjustable nozzle screw shall be made of corrosion resistant materials.

D. All heads are to be operated and site adjusted to match precipitation rate of all heads in the zone with proper nozzle selection and arc adjustments.

E. MICRO-SPRAYS -The nozzle shall be constructed of corrosion and UV-resistant plastic. The nozzle shall have a pop-up stem that when under water pressure, pops up an additional inch. It shall also have a stainless steel retraction spring to retract the stem when water pressure is released. The stem shall have an integral elastomeric flow bushing for maintaining a constant flow rate over the operating pressure range of 25 to 60 PSI (1.7 to 4.1 bars; 172 to 413 kPa). The nozzle shall be protected from debris by a stainless steel screen that is integral to the pop-up stem. The nozzle shall have standard female threads that are compatible with the threaded riser on Hunter spray heads as well as some other manufacturer’s spray heads. The nozzle shall carry a two-year, exchange warranty (not prorated). Must be installed in Institutional spray body.

2.9 DRIP IRRIGATION

A. The dripperline shall be Techline CV as manufactured by Netafim Irrigation, Inc. Dripper flow rate and spacing shall be as indicated on the Drawings.

B. Soil Staples (TLS6): All on-surface/under mulch Techline CV/Techline Techlite installations shall be held in place with Techline Soil Staples spaced evenly every 3' to 5' on center, and with two staples on each change of direction.

C. Line Flushing Valves: All Techline/Techlite systems shall be installed with Netafim Automatic Line Flushing Valves as indicated on drawings. Techline CV zones do not require an automatic line flushing valve but must have a manual flushing port(s) in the position that an automatic flush valve would be positioned.

D. Pressure Regulator: A pressure regulator shall be installed at each zone valve or on the main line to ensure operating pressures do not exceed system requirements. The pressure regulator shall be a Netafim Pressure Regulator.

E. Disc Filter: A disc filter shall be installed at each zone valve or on the main line to ensure proper filtration. The filter shall be a Netafim Disc Filter. Model number and mesh as indicated on the Drawings.

2.10 QUICK COUPLING VALVES

A. All quick coupling valves shall be installed with an adjustable "O" ring type swing joint riser assembly (triple swing joint riser). These triple swing joint risers shall be of schedule 80 PVC unless otherwise designated on the Drawings. The swing joint riser size shall match the quick coupling valve inlet unless otherwise designated on the Drawings.

B. Quick couplers shall be Buckner Model #QB-5LRC-10, double lug only. Quick coupler keys shall match coupler model specified.

C. The Contractor shall provide two (2) quick coupler keys matched to quick coupler valve.

2.11 HYDROMETER/MASTER VALVE/FLOW METER

A. Master valves with flow meters shall be manufactured by Arad Ltd., model No. IS-BM- (size of hydrometer). Size as indicated on the Drawings.

2.12 ELECTRIC CONTROLLER

A. The electric irrigation controller shall be an MIR-5000 type controller capable of operating the number of stations as indicated on the Drawings. The system is designed to operate multiple valves at a time, unless otherwise noted. The controller will be specified on the Drawings.

B. Power source shall be standard 120 volt 60 Cycle AC. Output for operation of companion solenoid actuated valves shall be 24 volts 60 Cycle AC., unless otherwise noted on the Drawings.

C. Provide an automatic rain/freeze shutoff with controller.

D. All local and applicable codes shall take precedence in the furnishing and/or connecting of the 120 volt electrical service to the controller.

E. Adequate coverage and protect of the 24 volt service wires leading from the controllers shall be installed from the bottom of the controllers to at least six (6) inches below ground level or to floor level.

2.13 BACKFLOW PREVENTER

A. A backflow prevention device shall be located and sized as shown on the Drawings.

B. This assembly shall be installed in a box and conform to the City Plumbing Codes and manufacturer's recommendations.

C. Backflow preventer housing shall be called for on the Drawings.

2.14 PUMP

A. Any pump as part of this project will be called for on the Drawings. Furnish and install a pump panel and flow switch.

B. Pump housing shall be called for on the Drawings.

2.15 GLUE

A. All glue used shall be Red Christie Hot Glue.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Design Pressure: This irrigation system has been designed to operate with a minimum static inlet water pressure as indicated on the Drawings. The Contractor shall take a pressure reading prior to beginning construction. If the pressure reading is 5% less than above, the Contractor shall notify the Engineer/Architect.

B. Contractor Responsibility: The Contractor shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in equipment usage, area dimensions or water pressure exist that might not have been considered in the design. Any deviation between the Contract Documents and field conditions shall be brought to the attention of the Engineer/Architect in writing. In the event this notification is not performed, the Contractor shall assume full responsibility for any revision necessary.

C. Staking: Before installation is started, place a stake or flag where each sprinkler is to be located, in accordance with the Drawings. Staking shall be approved by the Engineer/Architect before proceeding.

D. Piping Layout: Piping layout is diagrammatic. Route piping around existing trees and root zones in such a manner as to avoid damage to plantings. Where access is restricted, bore under large existing trees to avoid damage and exposure of the root system. Do not dig within the ball of newly planted trees or shrubs.

E. In areas where trees are present, trenches will be adjusted on site to provide a minimum clearance of four times the trunk diameter of the tree (at its base) between any tree and any trench.

F. All material and equipment shall be delivered to the Worksite in unbroken reels, cartons or other packaging to demonstrate that such material is new and of a quality and grade in keeping with the intent of these Specifications.

G. Refer to the Drawings for drip installation details.

3.2 EXCAVATION AND TRENCHING

A. All backfill operations shall conform to Title 30, TAC, Chapter 344.62, and effective Jan. 1, 2009.

B. The Contractor shall perform all excavation to the depth indicated in these Specifications and Contract drawings. The banks of trenches shall be kept as nearly vertical as practicable. Trenches shall be wide enough to allow a minimum of 4" between parallel pipelines or electrical wiring. Where rock excavation is required, or where stones or rubbles is encountered in the bottom of the trench that would create a concentrated pressure on the pipe, the rock, stones, or rubble shall be removed to a depth of six (6) inches minimum below the trench depth indicated. The over depth rock excavation and all excess trench excavation shall be backfilled with loose, moist earth or sand, thoroughly tamped. Whenever wet or otherwise unstable soil that is incapable of properly supporting the pipe is encountered in the trench bottom, such shall be removed to a depth and length required, and the trench backfilled to trench bottom grade as hereinafter specified, with course sand, fine gravel or other suitable material.

C. Bottom of trench grade shall be continued past ground surface deviations to avoid air pockets and low collection points in the line. The minimum cover specifications shall govern regardless of variations in ground surface profile and the occasional deeper excavation required at banks and other field conditions. Excavation shall be such that a uniform trench grade variation will occur in all cases where variations are necessary.

D. Trench excavation shall comprise the satisfactory removal and disposition of all materials, and shall include all shoring and sheeting required to protect the excavation and to safeguard employees.

E. During excavation, material suitable for backfilling shall be stockpiled in an orderly manner a sufficient distance back from edge of trenches to avoid overloading and prevent slides or cave-ins. Material unsuitable for backfilling shall be wasted as directed by the Engineer/Architect. When excavated material is of a rocky nature and the topsoil or any other layer of excavated material is suitable for pipe bedding and backfill in the vicinity of the pipe, such material shall be separately stockpiled for use in such bedding and pipe backfill operations, unless satisfactory imported material is used.

F. All excavations and backfill shall be unclassified and covered in the basic bid. No additional compensation will be allowed for rock or rubble encountered.

G. Restore all surfaces, existing underground installations, etc., damaged or cut as a result of the excavations to their original conditions in a manner acceptable to the Engineer/Architect.

3.3 PIPE INSTALLATION

A. Sprinkler Mains: Sprinkler mains are that portion of piping from water source to electric valves. This portion of piping is subject to surges since it is a closed portion of the sprinkler system. Sprinkler mains shall be installed in a trench with a minimum of 18 inches of cover.

B. Lateral Piping: Lateral piping is that portion of piping from electrical valve to sprinkler heads. This portion of piping is not subject to surges since it is an "open end" portion of the sprinkler system. Lateral piping shall be installed in a trench with a minimum of 18 inches of cover.

C. Remove lumber, rubbish, and rocks from trenches. Provide firm, uniform bearing for entire length of each pipeline to prevent uneven settlement. Wedging or blocking of pipe will not be permitted. Remove foreign matter or dirt from inside of pipe before welding, and keep piping clean during and after laying pipe.

D. PVC pipe shall not be installed where there is water in the trench, nor shall PVC pipe be laid when temperature is 40 deg. F or below or when rain is imminent. PVC pipe will expand and contract as the temperature changes. Therefore, pipe shall be snaked from side to side of trench bottom to allow for expansion and contraction.

E. PVC pipe shall be cut with a hand saw or hack saw with the assistance of a square and sawing vice, or in a manner so as to ensure a square cut. Burrs at cut ends shall be removed prior to installation so that a smooth unobstructed flow will be obtained.

F. All PVC pipe shall be installed with pipe markings facing the top of the trench.

G. Thrust blocks shall be installed as indicated on the Drawings.

3.4 PVC PIPE AND FITTING ASSEMBLY

A. Make solvent-welded joints following standards noted herein. Thoroughly clean pipe and fittings of dirt, dust, and moisture with an approved colored PVC primer before applying solvent.

B. All plastic to plastic joints shall be solvent-weld joints or slip seal joints. Only the solvent recommended by the pipe manufacturer shall be used. All plastic pipe and fittings shall be installed as outlined and instructed by the pipe manufacturer and it shall be the Contractor's responsibility to make arrangements with the pipe manufacturer for any field assistance that may be necessary. The Contractor shall assume full responsibility for the correct installation.

C. Solvent weld joints shall be made in the following manner:

1. Thoroughly clean the mating pipe and fittings with approved cleaner and a clean dry cloth.
2. Apply a uniform coat of solvent to the outside of the pipe with a non-synthetic bristle brush or applicator.
3. Apply solvent to inside of the fitting in a similar manner.
4. Re-apply a light coat of solvent to the pipe and quickly insert it into the fitting.
5. Give the pipe or fitting a quarter turn to ensure even distribution of the solvent and make sure that the pipe is inserted to the full depth of the fitting socket.
6. Hold in position for 15 seconds.
7. Wipe of excess solvent that appears at the outer shoulder of the fitting. Cure 24 hours before charging system with water.

D. PVC to Metal Connection: Work metal connections first. Use a non-hardening pipe dope such as Permatex No. 2 or "Teflon" tape on threaded PVC to metal joints. Use only light wrench pressure. All plastic to metal joints shall be made with plastic male adapters.

E. Threaded PVC Connections: Where required, use threaded PVC adapters into which pipe may be welded.

3.5 HYDROSTATIC TESTS

A. Pressure Test: After the pipe is laid, the joints completed, and the trench partially backfilled, leaving the joints exposed for examination, the newly laid piping or any valve section of main pressure line piping shall, unless otherwise specified, be subjected for four hours to a hydrostatic pressure test of 90 PSI when welded plastic joints have cured for at least 24 hours and with risers capped. Each valve shall be opened and closed during the test. Enclosed pipe, joints, fittings, and valves shall be carefully examined during the partially open trench test. Joints showing visible leakage shall be replaced or remade, as necessary. Cracked or defective pipe, joints, fittings, or valves discovered in consequence of this pressure test shall be repeated until the test results are satisfactory. All replacement and repair shall be at the Contractor's cost.

B. The Engineer/Architect must be in attendance during all testing. Provide a 48 hour notice to the Engineer/Architect prior to any testing.

C. Testing to be completed at the expense of the Contractor.

3.6 CONTROL WIRE INSTALLATION

A. All electric control cables shall be of size as shown on the Drawings and/or as specified and shall be installed in the piping trenches wherever possible.

B. Install wire in the pipe trench as detailed on the Drawings.

C. Wire shall be placed in the trench as loose as possible and with as much slack as possible to allow for expansion and contraction of the wire. Where it is necessary to run wire in a separate trench, the wire shall have at least twelve (12) inches of cover.

D. All wire connections at remote control valves, either direct buried or in boxes, and at all splices shall be left with sufficient slack so that in case of repair, the splice may be brought to the surface without disconnecting the wires. Slack shall be coiled in approximately 1” wraps.

E. Each remote control valve or group of remote control valves, which are to be connected to one station of a controller, shall have wire sizes as shown in the wiring diagrams on the Drawings or as specified. All remote control valves, what are to be connected to the same controller, shall be connected to a common ground wire system entirely independent of the common ground wire system of all other controllers. Only those remote control valves which are being controlled by one specific controller, shall be connected to that controller’s common ground wire system.

F. All control wire less than 500 feet in length shall be continuous without splices or joints from the controller to the valves. Connections to the electric valves shall be made within 18 inches of the valve using connectors specified in Paragraph 2.4 of this section, unless otherwise approved by the Engineer/Architect in writing.

G. The Contractor shall obtain the Engineer/Architect's approval for wire routing when installed in a separate ditch. Control wires may be installed in a common ditch with piping; however, wires must be installed underneath mainline piping.

H. All wire passing under existing or future paving, sidewalk, construction, etc., shall be encased in 1” minimum PVC Schedule 40 conduit extending at least twelve (12) inches beyond edges of paving, sidewalks, or construction.

3.7 POP-UP SPRAY, MICRO-SPRAY, ROTORY AND BUBBLER HEADS

A. Provide heads and nozzles as specified and install in locations as shown on the Contract Drawings.

B. All heads of a particular type and for a particular function in the system shall be of the same manufacturer and shall be marked with the manufacturer's name and identification, in such a position that they can be identified without being removed from the system. All sprinkler heads and quick coupling valves shall be set perpendicular to finished grades unless otherwise indicated on the Drawings.

C. Pop-up spray and micro-spray heads shall be installed on a swing joint pipe connector as detailed. Rotary heads shall be installed on a double swing joint connected to the lateral pipe. Bubbler shall be a tree well flexible riser-bubbler head on a flex pipe. Provide wire staple to secure the bubbler to the top of the root ball. Keep heads a minimum of 4 inches from paved surfaces.

D. Heads shall be installed with underside of flange flush with the finished grade.

E. Contractor will be required to adjust heads as necessary after establishment of grass or other plant material.

3.8 QUICK COUPLING VALVES

A. Quick coupling valves shall be installed as noted on the Drawings with a ball valve preceding the quick coupler for shut off.

B. Quick coupling valves shall be installed with the underside of flange flush with the finished grade.

C. Quick coupling valves shall be installed on a swing joint assembly as detailed on the submitted and approved shop drawings.

3.9 MANUAL VALVES

A. Manual valves shall be sized and located where shown on the Drawings.

B. Valve boxes shall be adjusted to be flush with finished grade.

C. Valve boxes shall be properly supported and of sufficient construction that tractors, mowers or other equipment crossing over the boxes will not push boxes down and damage the pipe, valve, or box.

3.10 VALVE AND VALVE BOX PLACEMENT

A. A ball valve shall precede each valve to provide shut off for repair of valves.

B. All manual, electric, and quick coupling valves shall be in boxes as specified in Paragraph 2.6 of this section, and shall be set with a minimum of six (6) inches of space between their top surface and the bottom of the valve box. The base of the box shall be filled with pea gravel per manufacturer's installation instructions.

C. Valves shall be fully opened and fully closed to ensure that all parts are in operating condition.

D. Valve boxes shall be set plumb, vertical, and concentric with the valve stem.

E. Any valve box which has moved from this required position so as to prevent the use of the operating wheel of the valve shall be reset by the Contractor at his own expense.

3.11 ELECTRIC CONTROLLER

A. Electric controller shall be located as shown on the Drawings and shall be capable of operating the number of stations indicated.

B. The system is designed to operate multiple sections at a time, unless otherwise noted on the Drawings in strict accordance with the manufacturer's published installation instructions.

3.12 ELECTRIC REMOTE CONTROL VALVES

A. Remote control valves shall be located and sized as shown on the Drawings. All electrical connections shall be made when the weather is dry with connection kits as specified in Paragraph 2.4 of this section in strict accordance with manufacturer's recommended procedures. All remote control valves shall be installed in a horizontal position, in accordance to the manufacturer's published installation instructions.

B. It shall be the responsibility of the Contractor to furnish and install the proper size wire on each of the low voltage circuits from the master control center to the various electric remote control valves.

C. Consideration shall be given to each circuit for allowance of voltage drop and economy consistent with accepted practices of electrical installation. Under no circumstances shall the voltage of any branch circuit be reduced more than proper due to length of run exceeding the maximum allowable for the wire size used. “Up-sizing” wire to compensate for voltage drop shall be at the Contractor’s expense, whether or not indicated on the Drawings.

3.13 BACKFILL AND COMPACTION

A. After system is operating and required tests and inspections have been made, the trenches shall be carefully backfilled with the excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand, gravel, soft shale, or other approved materials, free from large clods of earth or stone. Rock, broken concrete, or pavement, and large boulders shall not be used as backfill material. The backfill shall be thoroughly compacted and made flush with the adjacent soil level.

B. Compact trenches in areas to be planted by thoroughly flooding the backfill with water. Compact all other areas by flooding or hand tamping. The jetting process may be used in areas when flooding.

C. Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to a minimum of 90% density.

D. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required for compaction, then refilled and compacted with the surface restored to the required grade and left in a completed surface condition as described above.

E. Specifically tamp backfill under heads and around the flange of heads in a one (1) foot radius by a suitable means after trench backfill has dried from flooding to prevent heads loosening in the ground.

3.14 FINAL ADJUSTMENT

A. After installation has been completed, make final adjustment of sprinkler system prior to Engineer/Architect's final inspection.

B. Completely flush system to remove debris from lines by removing nozzle from heads on ends of lines and turning on system.

C. Check sprinklers for proper operation and proper alignment for direction of throw.

D. Check each new section for operating pressure and balance to other sections by use of flow adjustment on top of each valve.

E. Check nuzzling for proper coverage. Prevailing wind conditions may indicate that arc or angle of spray should be other than as shown on the Drawings. In this case, change nozzles to provide correct coverage and furnish as-built data to Engineer/Architect with each change.

F. After system is thoroughly flushed and ready for operation, each section of sprinklers shall be adjusted to control pressure at heads. Use the following method, one section at a time:

1. Remove last head on section and install a temporary riser above grade. Install tee with pressure gauge attached on top of riser and re-install head with nipple onto tee.
2. Correct operating pressure at last head of each section as follows: Spray Heads - 20-25 psi; rotor heads - 30 to 40 psi (and as recommended by the manufacturer).
3. After replacing head, at grade, tamp thoroughly around head.

G. Prior to final inspection, cycle the system through three (3) complete watering schedules of not less than twenty (20) minutes each for sprinklers and three (3) hours each for drip to assure proper function of sprinklers, valves and controller.

3.15 CLEAN-UP

A. The Site shall be thoroughly cleaned of all waste materials and all unused or salvaged materials, equipment, tools, etc.

B. After completion of the work, areas disturbed shall be leveled and the Site shall be raked clean and left in an orderly condition.

3.16 TEMPORARY IRRIGATION FOR GRASS ESTABLISHMENT

If the permanent irrigation system is inoperable the Contractor shall provide temporary irrigation for all new turf areas. Temporary irrigation may include equipment securely staked above grade. It shall be the Contractor's responsibility to provide complete, consistent temporary coverage in order to establish a viable, mowable stand of grass. Any above grade equipment shall be removed by the Contractor upon acceptance of the turf by the Engineer/Architect.

PART 4 - METHOD OF MEASUREMENT

MEASUREMENT:

Landscape Irrigation Systems described in this section will be paid for on a lump sum basis wherein no measurement will be made.

PART 5 - BASIS OF PAYMENT

PAYMENT:

A. Landscape Irrigation Systems will be paid for at the Contract lump sum, which price will be full compensation for furnishing and installing equipment; shop drawings; providing all submittals and warranties; furnishing all labor, materials, tools, equipment; and incidentals necessary to complete the work as described in this section and related other sections of these Contract Documents, as well as maintenance until final acceptance.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK COVERED:

A. Mixing, placing, finishing and providing all related services necessary to construct all cast-in-place concrete work indicated on plans.

1.02 QUALITY ASSURANCE:

A. Comply with the latest published edition of the American Concrete Institute (ACI) and American Society of Testing and Materials (ASTM) standards and codes. Applicable standards and codes include, but are not limited to, the following:

1. ASTM A36 - Structural Steel.
2. ASTM C33 - Concrete Aggregates.
3. ASTM C39 - Concrete Strength of Molded Concrete Cylinders.
4. ASTM C94 - Ready-Mixed Concrete.
5. ASTM C143 - Slump of Portland Cement Concrete.
6. ASTM C150 - Portland Cement Concrete.
7. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
8. ACI 301 - Specification for Structural Concrete for Building.
9. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
10. ACI 315 - Manual of Standard practice for Detailing.
11. ACI 318 - Building Code Requirements for Reinforced Concrete.
12. ACI 347 - Recommended Practice for Concrete Formwork.

B. Submit compliance submittals as specified in Division 1, including but not limited to the following: bar schedule, bar details, shop drawings including size and location of openings, waterstops, joint systems and curing method.

C. Submit proposed concrete mix proportions to Engineer prior to placing concrete.

PART 2 - PRODUCTS

2.01 PORTLAND CEMENT:

A. Type I, Type II or Type III, conforming to ASTM C150, as modified by Texas State Department of Highways and Public Transportation, 1982 Standard Specifications.

B. Type I or II cement may be used unless Type II is specified.

C. Except when Type II is specified, Type III may be used when the anticipated air temperature for the 12 hours following the placement of the concrete is not anticipated to exceed 60°F.

D. Type III may be used in all pre-cast, pre-stressed concrete, except in piling when Type II cement is required for use as substructure concrete.

E. All cement used in a monolithic placement shall be of the same type.

F. Cements may be either bagged or bulk. Partially set or caked cement will be rejected.

G. All types of cements shall be "low alkali" cements.

2.01 WATER:

A. Water shall be clear, fresh, free from injurious amounts of oil, alkaline, acid or organic matter, or other deleterious substances and shall not contain more than 1000 parts per million of chlorides, as Cl, nor more than 1000 parts per million of sulfates, as SO_4.

B. Water of known potable quality requires no testing. Other sources shall meet the requirements of AASHTO T-26.

C. Water shall have a pH of not less than 4.5 or more than 8.5.

2.03 FINE AGGREGATE:

A. Natural sand, manufactured sand or a combination of the two, with or without mineral filler.

B. The sand, or mixture of sand, comprising a single fine aggregate, shall consist of clean, hard, durable, uncoated grains and shall be essentially free from clay lumps, salt or alkali, and other foreign material.

C. The maximum permissible percentage, by weight of deleterious substances shall not exceed the following:

Material removed by decantation	3.0%
Other deleterious substances such as coal, shale, coated grains and soft flaky particles	3.0%

An additional loss of 2% by decantation may be allowed, provided this new additional loss is material of the same quality as specified for fine aggregate or mineral filler.

D. Gradation, percent of weight retained:

Sieve Size	Percent Retained
3/8 inch	0
No. 4	0 - 5
No. 8	0 - 20
No. 16	15 - 50
No. 30	35 - 75
No. 50	65 - 90
No. 100	90 - 100
No. 200	97 - 100

E. Fineness Modulus:

1. For Grade 1 only - 2.3 minimum, 3.1 maximum.

F. Mineral Filler:

1. May be added upon written authorization of Engineer

2. Shall be stone dust or clean crushed sand, or other approved inert material.

3. Shall not exceed 5% of the fine aggregate.

4. Shall meet the following requirements:

a. Passing No. 30 sieve	95 to 100%
b. Passing No. 100 sieve	70 to 100%

2.04 COARSE AGGREGATE:

A. Crushed stone, gravel, crushed gravel, crushed blast furnace slag or a combination of these.

B. Gravel and crushed gravel shall consist of clean, hard durable particles, free from adherent coating, thin or elongated pieces, soft or disintegrated particles, dirt, organic or deleterious substances, salt or alkali, and other foreign material.

C. Crushed stone shall consist of the clean, dust free product resulting from the crushing of stone. There shall be no adherent coatings, clay, loam, organic or deleterious substances, salt or alkali, and other foreign material.

D. The maximum permissible percentage, by weight, of deleterious substances shall not exceed the following:

Material removed by decantation	1.00%
Shale, Slate or other similar material	1.00%
Clay lumps	0.25%
Soft fragments	3.00%
Other deleterious substances, including friable, thin, elongated or laminated pieces	3.00%
The sum of all deleterious substances exclusive of material removed by decantation	5.00%

E. Coarse aggregates shall have a percent wear of not more than 45 when tested in accordance with Test Method Tex-410-A.

F. Gradation, percent of weight retained:

1. Grade No. 1 - Maximum Nominal Size 2 1/2-inches (63 mm)

Sieve	Percentage Retained
2 1/2-inches	0
2-inches	0 - 20
1 1/2-inches	15 - 50
3/4-inches	60 - 80
No. 4	95 - 100

2. Grade No. 2 - Maximum Nominal Size 1 1/2-inches (37.5 mm)

Sieve	Percentage Retained
2-inches	0
1 1/2-inches	0 - 5
3/4-inches	30 - 65
3/8-inches	70 - 90
No. 4	95 - 100

3. Grade No. 3 - Maximum Nominal Size 1-inch (25 mm)

Sieve	Percentage Retained
1 1/2-inches	0 - 5
3/4-inches	10 - 40
1/2-inches	40 - 75

No. 4	95 - 100

4. Grade No. 4 - Maximum Nominal Size 3/8-inch (9.5 mm)

Sieve	Percentage Retained
1/2-inches	0 - 5
3/8-inches	5 - 30
No. 4	75 - 100

G. Gradation Requirements - maximum size of aggregate for structural concrete shall not exceed three inches, and shall be reduced in size to meet the following conditions:

1. One-sixth (1/6) of the least dimension between forms of that part of the structure in which concrete is to be placed.

2. Three-fourths (3/4) of the clear space between reinforcement.

3. The maximum size aggregate is defined as the clear space between the sides of the smallest square openings through which 95 percent of the weight of the aggregate can be passed.

4. Unless otherwise noted or restricted by above, the Grade No. 2 gradation shall be used.

2.05 PIT-RUN AGGREGATE:

A. Pit-run aggregate is the natural gravel and sand obtained from pits without the addition of other fine or coarse aggregates, and shall consist of hard, durable, uncoated pebbles or stone particles mixed with sand.

B. Pit-run aggregate shall be free from lumps of clay and injurious amounts of dust, shale, soft or flaky particles, salt and alkali.

C. Pit-run aggregate shall be well graded from coarse to fine when tested by standard laboratory methods and shall meet the following minimum requirements for percentages by weight:

1. Retained on 1/4 in sieve 55 to 60%

D. Pit-run aggregate shall not be used for high-strength concrete of 3000 psi and stronger.

E. Pit-run aggregate may be used only for concrete cushion, cradle and protection for pipe.

2.06 ADMIXTURES:

A. Concrete admixtures shall comply with Section 03320.

2.07 REINFORCING STEEL:

A. Reinforcing steel shall comply with Section 03330.

2.08 CURING MATERIALS:

A. Liquid Membrane: white pigmented chlorinated rubber, ASTM C309.

B. Liquid Membrane: resin base, clear compound, permitting application of paint, Servicised Products Corporation - Code 2802 or equal.

C. Plastic Film: White pigmented, 0.00085-inches (minimum) thick.

D. Burlap: jute fabric, lean, free of impurities.

E. Surface Hardener: gray crystal, acidic fluosilicate base, slightly hygroscopic chemical surface hardener, SIKA Hardener, SIKA Chemical Corporation, or equal.

2.09 JOINT MATERIALS:

A. Joint Sealer: hot poured, non-extruding, elastic, ASTM D1190.

B. Preformed Expansion Joint Filler: non-extruding, bituminous fiber, ASTM D1751.

2.10 WATERSTOP:

A. Polyvinyl chloride or rubber, centerbulb.

B. Size to suit joinings, minimum 6-inches.

2.11 FORM MATERIALS:

A. Use plywood, metal, metal framed plywood faced or other acceptable panel-type material.

B. Coat forms with non-bonding, non-staining commercial compounds.

2.12 MOISTURE BARRIER:

A. Polyethylene sheet, minimum 8-mil., ASTM E154.

2.13 CONCRETE MIX DESIGN AND CONTROL:

A. Submit not less than 10 days prior to the start of concreting operations to the Engineer:

1. Mix design, using a coarse aggregate factor acceptable to the Engineer.

2. Sufficient samples of all materials to be incorporated into the mix for testing.

3. Full description of the source of supply of each material component.

B. Coarse aggregate factor:

1. Not more than 0.82 when voids less than 48%.

2. Not more than 0.85 when voids exceed 48%.

3. Not less than 0.68.

C. No changes or deviations from proportions or sources of supply without approval of Engineer.

D. No concrete may be placed on the job site until the mix design has been approved by Engineer in writing to the Contractor.

2.14 CONCRETE QUALITY:

A. Consistency:

1. Mortar shall cling to the coarse aggregate.

2. The aggregate shall not segregate during transport.

3. The concrete and mortar shall show no free water when removed from the mixer.

B. The consistency should allow the completion of all finishing operations with the addition of water to the surface.

C. The concrete shall be uniform, workable, cohesive, possess satisfactory finishing qualities and be of the stiffest consistency that can be placed and vibrated into a homogeneous mass.

D. Excessive bleeding shall be avoided.

E. Slump requirements shall be as follows:

Structural Concrete	Average Slump	Maximum Slump
1. Cased Drilled Shafts and Thin-walled Sections (9-inches or less)	4	5
2. Slabs, Caps, Columns, Piers, wall sections over 9-inches. etc.	3	4
3. Slip Form Paving	1/2	2
4. Underwater or Seal Concrete	5	6
5. Rip-rap, Curb, Gutter and other Miscellaneous Surfaces	As Specified By Owner	As Specified By Owner

NOTE: No concrete shall be permitted with slump in excess of the maximums shown. Any concrete mix failing to meet the above consistency requirements, although meeting the slump requirements shall be considered unsatisfactory; and the mix shall be changed to correct such unsatisfactory conditions.

F. The concrete shall comply with Table 1 below:

TABLE 1 - CLASSES OF CONCRETE

Class Of Concrete	Minimum Maximum SX Cement Per CY	Minimum Comp. Strength 28-day PSI	Minimum Beam Strength 7-day psi ****	Maximum Water Cement Item 2.1.1 (c)(4)	Coarse Aggregate Number
A	5.0	3000	500	6.5	2-3-4

B	4.0	2000	330	8.0	2-3-4
C*	6.0	3600	600	6.0	1-2-3**
D	3.0	1500	250	11.0	2-3-4
E	6.0	3000	500	7.0	2-3
F	6.5	4200	700	5.5	2-3
H***	6.5 - 8.0	ASP	NA	5.5	3

ASP = As Specified on Plans.
*Entrained Air.
**No. 1 coarse aggregate may be used in foundations only (Except cased drilled shafts).
***Prestressed Concrete.
****ASTI C293 (Center Point).

2.15 GROUT:

A. Non-Shrink:

1. Use premixed non-shrink, Embeco Pre-Mixed Grout or Embeco Pre-Mixed Mortar by Master Builders Company or equal.

2. Keep water to a minimum for placing by the dry packing method.

PART 3 - EXECUTION

3.01 SUBGRADE:

A. Insure subgrade is true to line and grade and compacted as specified.

B. Fill and recompact any ruts or depressions.

C. Check cross section with a template.

D. Place moisture barrier or moisten subgrade prior to placing of concrete. Method to be approved by Engineer.

3.02 FORMS:

A. Provide forms for all concrete work, including footings and base slabs.

B. Construct forms so that completed concrete will conform to shapes, lines, grades and dimensions indicated and required.

C. Forms shall be true, plumb and level with reasonably tight joints. Adequately support and brace forms.

D. Place anchors, inserts, blots, sleeves and other devices indicated or required for the various portions of all the work.

E. Oil temporary forms with non-staining form oil before reinforcing steel is placed.

F. Rough form finish as defined by ACI 301 permitted for concealed concrete.

G. Smooth form finish as defined by ACI 301 permitted for concealed concrete.

H. Provide 3/4 inch chamfer on exposed corners and edges, and 1-foot below ground level.

3.03 REMOVAL OF FORMS:

A. Do not remove forms or supports until concrete has acquired sufficient strength to safely support its own weight and the superimposed loads.

B. Remove formwork for columns, walls, beam sides and other parts not supporting the weight of the concrete as soon as the concrete has hardened sufficiently to resist damage from removal operations.

C. Formwork for slabs, beam soffits and other parts supporting the weight of the concrete shall remain in place until the concrete has reached its specified 28-day strength.

D. Protect concrete from damage prior to acceptance.

E. Prohibit traffic until concrete is at least 10 days old.

F. Cure areas previously covered by forms.

3.04 MIXING CONCRETE:

A. Maintain all equipment, tools, and machinery used for hauling materials and performing any part of the work to insure completion of the work underway without excessive delays for repairs or replacement.

B. Mixing shall be done in a mixer of adequate size and type to produce uniform distribution of the material throughout the mass.

C. The mixer shall have a plate affixed showing the manufacturer's recommended operating data and it shall be operated within the speed and capacity limits stated thereon.

D. The absolute volume of the concrete batch shall not exceed the rated capacity of the mixer.

E. The entire contents of the drum shall be discharged before any materials are placed.

F. Improperly mixed concrete will not be placed.

G. The mixing time shall be in accordance with the recommendations of the mixer manufacturer.

H. Transit Mix Concrete:

1. Sufficient transit mix equipment shall be assigned exclusively to the project as required for continuous operation.

2. Satisfactory evidence shall be furnished so that the delivery of concrete shall be continuous at regular and uniform intervals, without stoppage or interruption.

3. Concrete shall not be placed on the job after a period of 1 hour after the cement has been placed in the mixer, with mixer turning; 30 minutes without turning.

I. Continuous Volumetric Mix Concrete:

1. A mobile, continuous, volumetric mixer of the rotating puddle type may be used for when approved by Engineer.

2. Mixers shall be designed to receive all the concrete ingredients, including admixtures, required by the mix design in a continuous uniform rate and mixed to the required consistency before discharging.

3. The mixers shall have adequate water supply and metering devices.

4. Calibration of these mixers will be required.

3.05 PLACING CONCRETE:

A. The minimum temperature of all concrete at the time of placement shall not be less than 50°F.

B. Clean transporting equipment, reinforcing and embedded items before placing concrete.

C. Batch trucks or paving equipment not permitted on prepared subgrade unless authorized by the Engineer based on actual job conditions.

D. Place no concrete until after inspection of forms by Engineer.

E. The maximum time interval between the addition of cement to the batch, and the placing of concrete in the forms shall not exceed the following:

Air or Concrete Temperature	Non-Agitated Concrete	Maximum Time
80°F or above	26.6°C	15 minutes
35 to 79°F	1.6 to 26.1°C	30 minutes

Air or Concrete Temperature	Agitated Concrete	Maximum Time
90°F or above	32.2°C	45 minutes
75 to 89°F	23.9 to 31.6°C	60 minutes
35 to 74°F	1.6 to 23.3°C	90 minutes

F. Prevent segregation during placing.

G. Consolidate flat work with one pass of mechanical vibrator moving parallel to centerline. Unusual section and widths may be hand puddled and finished.

H. Place concrete continuously so that each pour unit will be monolithic in construction and will terminate at expansion, contraction or construction joint. Permit not more than 30 minutes between depositing adjacent batches.

I. Place slab concrete over membrane before the waterproofing membrane becomes damaged or dirty.

J. Concrete placement will not be permitted when impending weather conditions will impair the quality of the work.

K. Slope horizontal surfaces of exterior concrete for drainage.

L. Deposit concrete in forms in horizontal layers not deeper than 24 inches. Avoid inclined construction joints. Place each layer while preceding layer is still plastic to avoid cold joints.

M. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.

N. Do not use vibrators to transport concrete inside of forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to penetrate placed layer of concrete and at least 6-inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. Limit vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

3.06 PLACING CONCRETE IN WATER:

A. Concrete shall be deposited in water only when specified on the plans or with written permission of the Engineer.

B. The forms or cofferdams shall be sufficiently tight to prevent any water current passing through the space in which the concrete is deposited.

C. Pump will not be permitted during the concrete placing, nor until it has set for at least 36 hours.

D. The concrete shall be placed with a tremie, closed bottom-dump bucket or other approved method.

E. The concrete shall not be allowed to fall freely through the water nor shall it be disturbed after it has been placed. Its surface shall be kept approximately level during placement.

F. The tremie shall consist of a water-tight tube 14-inches or less in diameter. It shall be constructed so that the bottom can be sealed and opened after it is in place and fully charged with concrete. It shall be supported so that it can be easily moved horizontally to cover all the work area and vertically to control the concrete flow. The lower end of the tremie shall be submerged in the concrete at all times.

G. Bottom-dump buckets used for underwater placing shall have a capacity of not less than one-half cubic yard. It shall be lowered gradually and carefully until it rests upon the concrete already placed and raised very slowly during the upward travel; the intent being to maintain still water at the point of discharge and to avoid agitating the mixture.

H. The placing operations shall be continuous until the work is complete.

I. Unless otherwise specified, all concrete placed under water, except seal concrete, shall contain an additional sack of cement per cubic yard.

3.07 JOINTS:

A. Contraction Joints:

1. Extend entirely across flat slabs at locations shown.

2. Where location is not shown, maximum spacing is:

a. Driveways: 10-feet.

b. Sidewalks: 4-feet.

c. Other flat slabs: 20 times slab thickness.

3. Saw depth not less than 1/4 slab thickness.

B. Expansion Joint:

1. Install where shown on the plans.

2. Where location is not shown, place between all structures and features which project through, into or against slab.

3. Install according to manufacturer's recommendations. Set material securely before placing concrete.

4. Install 1-inch width unless shown otherwise.

C. Filling Joints:

1. Fill no later than 14 days after sawing.

2. Fill immediately following cleaning.

3. Fill to 1/8-inch of surface.

4. Remove excess while material is still pliable.

5. Refill low areas where necessary.

6. Omit filling sidewalk joints.

3.08 FINISHING EXTERIOR FLAT WORK:

A. Strike off and float as required.

B. Check surface with ten foot straight edge, maximum variance allowed is 1/8-inch.

C. Drag concrete surface longitudinally with double thickness burlap drag after completion of straight edging unless noted otherwise.

D. Use edger on edges of slab.

E. Use hand finishing only when approved by Engineer.

3.09 FINISHING OTHER CONCRETE:

A. Interior floors: smooth, steel-troweled finish. Use edger on exposed edges. Grind smooth defects which would telegraph through applied finish flooring.

B. Exterior walks and steps: lightly broomed finish transverse to traffic flow. Use edger on exposed edges.

C. Other surfaces:

1. Remove fins, projections and loose material.

2. Clean surfaces of form oil.

3. Patch honeycomb, aggregate pockets, voids and holes as follows:

a. Chip out until sound concrete is exposed to minimum depth of 1-inch.

b. Prepare patching mortar with approximately two parts of normal Portland cement, one part white cement, nine parts fine aggregate; vary proportions of aggregate as necessary to match color of adjacent concrete.

4. Fill holes left by form ties to within 1 inch of surface with non-shrink grout. Fill remainder with patching mortar specified hereinbefore.

5. Apply grout-cleaned finish to all exposed vertical surfaces. Wet surface and rub grout on surfaces with rubber or cork float. Scrape off excess grout and finish with brick rubbing or as approved by Engineer.

D. Coordinate required finish with Engineer.

3.10 CURING:

A. Contractor shall inform the Engineer fully of the methods and procedures proposed for curing; shall provide proper equipment and in adequate amounts; and shall have approval of the proposed method, equipment and materials prior to placing concrete.

B. All concrete shall be cured for a period of 4 days except as noted herein.

1. Exceptions to 4-day Curing.

a. Upper surfaces of Bridge Roadways, Median and Sidewalk Slabs, and Top Slabs of Direct Traffic Culverts require 8 curing days.

b. A curing day is defined as a calendar day when the ambient temperature, taken in the shade away from artificial heat, is above 50° F(10°C) for at least 19 hours. If the ambient temperature is 50° F or less, a curing day is accepted only if satisfactory provisions are made to maintain the temperature at all surfaces of the concrete above 40° Fahrenheit (4.4°C) for the entire 24 hours.

C. Form Curing:

1. When forms are left in contact with the concrete, other curing methods shall not be required except for cold-weather protection.

D. Water Curing:

1. All exposed surfaces of the concrete shall be kept wet continuously for the required curing time. The water used for curing shall meet requirements for concrete mixing water.

a. Wet Mat:

(1) Cotton mats shall be used for this curing method. The mats shall not be placed in contact with the concrete until such time that damage shall not occur to the surfaces.

(2) Damp burlap blankets made from 9-ounce stock may be placed upon the damp concrete surface for temporary protection prior to the application of the cotton mats.

(3) The mats may be placed by and wetted down after placement.

(4) Mat curing, except for continuous placements, shall commence not later than three hours after finishing of the roadway slab.

(5) The mats shall be weighted down adequately to provide continuous contact with all
concrete surfaces where possible.

(6) The surfaces of the concrete shall be kept wet for the required curing time.

(7) Surfaces which cannot be cured by contact shall be enclosed with mats, anchored positively to the forms, or to the ground, so that outside air cannot enter the enclosure. Sufficient moisture shall be provided inside the enclosure to keep all surfaces of the concrete wet.

b. Water spray:

(1) This method shall be accomplished by overlapping sprays or sprinklers, so that all unformed surfaces are kept continuously wet.

c. Ponding:

(1) This method requires the covering of the surface with a minimum of two inches (5 cm) of clean granular material, kept wet at all times; or water to a minimum depth of one inch (2.5 cm). Satisfactory provisions shall be made to provide a dam to
retain the granular material or water.

E. Membrane Curing

1. Unless otherwise shown on the plans, Type 2 membrane curing compound may be used where permitted.

2. A membrane shall be applied in a single, uniform coating at the rate of coverage recommended by the manufacturer and as approved by the Engineer, but not less than nine

gallons per 210 feet (.0038M^3 63M) of area. Tests for acceptance shall be at this specified rate.

3. Membrane curing shall not be applied to dry surfaces; but shall be applied to horizontal surfaces just before free moisture has disappeared.

4. Formed surfaces and surfaces which have been given a first rub shall be dampened and shall be moist at the time of application of the membrane.

	REQUIRED		**PERMITTED**	
Structure Unit Description	Water for Complete Curing	Membrane for Interim Curing	Water for Complete Curing	Membrane for Interim Curing
Upper surfaces of bridge roadway; median and sidewalk slabs; top slabs of direct traffic culverts; top surface of any concrete unit upon which concrete is to be placed and bonded at a later interval (stub walls risers, etc.) Other super-structure concrete (curbs, wing-walls, parapet walls, etc.)	X	X		Resin Basin
Top surface of precast and/or prestressed piling	X	X		
All substructure con-crete culverts box sewers inlets man-holes retaining walls riprap	X	X		

*Polyethylene sheeting or burlap polyethylene mats fastened to prevent outside air from entering into the concrete shall be considered equivalent to water or membrane curing per this item.

5. When membrane is used for complete curing, the film shall remain unbroken for the minimum curing period specified. Membrane which is damaged shall be corrected immediately by reapplication of membrane.

3.11 TESTING:

A. Furnish at least three cylinders or beams from each 40 cubic yard, or portion thereof for test purposes unless otherwise directed by Engineer. Test one cylinder at 7 days, test second cylinder at 28 days and test third cylinder only if needed for confirmation of compression strength.

3.12 MISCELLANEOUS CONCRETE ITEMS:

A. Filling-in: fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Use non-shrink grout as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Equipment bases and foundations: provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of the manufacturer furnishing machines and equipment. Use non-shrink grout as shown on plans.

C. Steel pan stairs: provide concrete fill for steel pan stair treads and landings and associated items. Cast-in safety inserts and accessories as shown on drawings. Screen, tamp and finish concrete surfaces as scheduled.

D. Reinforced masonry: provide concrete grout for reinforced masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Cast-in-place concrete for the work shown on the plans shall be measured by the cubic yard as specified in the pans and contract.

4.02 PAYMENT:

A. The accepted quantities of cast-in-place concrete shall be paid for at the unit bid price per cubic yard.

B. The unit bid price shall be full compensation for furnishing, hauling, and mixing all concrete materials, including trial batches; placing curing and finishing all concrete; for all grouting and joints; furnishing and placing all expansion and construction joints, except as provided in the plans; furnishing and placing metal flashing strips and waterstops; and for all forms and false-work, labor tools, equipment and incidentals necessary to complete the work.

C. The preceding provisions for payment shall not be interpreted to provide payment of concrete in railing, piling, precast, prestressed concrete units or other concrete items of which provision is otherwise made in the contract.

END OF SECTION

SECTION 03310

SUPPLIED CONCRETE

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK COVERED:

A. This work shall consist of furnishing, hauling, and mixing concrete materials.

1.02 QUALITY ASSURANCE:

A. Comply with the latest published edition of the American Concrete Institute (ACI) and American Society of Testing and Materials (ASTM) standards and codes. Applicable standards and codes include, but are not limited to, the following:

1. ASTM C33 - Concrete Aggregates.
2. ASTM C39 - Concrete Strength of Molded Concrete Cylinders.
3. ASTM C94 - Ready-Mixed Concrete.
4. ASTM C143 - Slump of Portland Cement Concrete.
5. ASTM C150 - Portland Cement Concrete.
6. ACI 301 - Specification for Structural Concrete for Building.
7. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and

B. Submit proposed concrete mix proportions to Engineer prior to placing concrete.

PART 2 - PRODUCTS

2.01 PORTLAND CEMENT:

A. Conforming to ASTM C150, as modified by Texas Department of Transportation, 1993 Standard Specifications.

B. Cements may be either bagged or bulk. Partially set or caked cement will be rejected.

C. All types of cements shall be "low alkali" cements.

2.02 WATER:

A. Water shall be clear, fresh, free from injurious amounts of oil, alkaline, acid or organic matter, or other deleterious substances and shall not contain more than 1000 parts per million of chlorides, as Cl, nor more than 1000 parts per million of sulfates, as SO_4.

B. Water of known potable quality requires no testing. Other sources shall meet the requirements of AASHTO T-26.

C. Water shall have a pH of not less than 4.5 or more than 8.5.

2.03 FINE AGGREGATE:

A. Natural sand, manufactured sand or a combination of the two, with or without mineral filler.

B. The sand, or mixture of sand, comprising a single fine aggregate, shall consist of clean, hard, durable, uncoated grains and shall be essentially free from clay lumps, salt or alkali, and other foreign material.

C. The maximum permissible percentage, by weight of deleterious substances shall not exceed the following:

Material removed by decantation	3.0%
Other deleterious substances such as coal, shale, coated grains and soft flaky particles	3.0%

An additional loss of 2% by decantation may be allowed, provided this new additional loss is material of the same quality as specified for fine aggregate or mineral filler.

D. Gradation, percent of weight retained:

Sieve Size	Percent Retained
3/8 inch	0
No. 4	0 - 5
No. 8	0 - 20
No. 16	15 - 50
No. 30	35 - 75
No. 50	65 - 90
No. 100	90 - 100
No. 200	97 - 100

E. Fineness Modulus:

1. For Grade 1 only - 2.3 minimum, 3.1 maximum.

F. Mineral Filler:

1. May be added upon written authorization of Engineer

2. Shall be stone dust or clean crushed sand, or other approved inert material.

3. Shall not exceed 5% of the fine aggregate.

4. Shall meet the following requirements:

   a. Passing No. 30 sieve 95 to 100%

   b. Passing No. 100 sieve 70 to 100%

2.04 COARSE AGGREGATE:

A. Crushed stone, gravel, crushed gravel, crushed blast furnace slag or a combination of these.

B. Gravel and crushed gravel shall consist of clean, hard durable particles, free from adherent coating, thin or elongated pieces, soft or disintegrated particles, dirt, organic or deleterious substances, salt or alkali, and other foreign material.

C. Crushed stone shall consist of the clean, dust free product resulting from the crushing of stone. There shall be no adherent coatings, clay, loam, organic or deleterious substances, salt or alkali, and other foreign material.

D. The maximum permissible percentage, by weight, of deleterious substances shall not exceed the following:

Material removed by decantation	1.00%
Shale, Slate or other similar material	1.00%
Clay lumps	0.25%
Soft fragments	3.00%
Other deleterious substances, including friable, thin, elongated or laminated pieces	3.00%
The sum of all deleterious substances exclusive of material removed by decantation	5.00%

E. Coarse aggregates shall have a percent wear of not more than 45 when tested in accordance with Test Method Tex-410-A.

F. Gradation, percent of weight retained:

1. Grade No. 1 - Maximum Nominal Size 2 1/2-inches (63 mm)

Sieve	Percentage Retained
2 1/2-inches	0
2-inches	0 - 20
1 1/2-inches	15 - 50
3/4-inches	60 - 80
No. 4	95 - 100

2. Grade No. 2 - Maximum Nominal Size 1 1/2-inches (37.5 mm)

Sieve	Percentage Retained
2-inches	0
1 1/2-inches	0 - 5
3/4-inches	30 - 65
3/8-inches	70 - 90
No. 4	95 - 100

3. Grade No. 3 - Maximum Nominal Size 1-inch (25 mm)

Sieve	Percentage Retained
1 1/2-inches	0 - 5
3/4-inches	10 - 40
1/2-inches	40 - 75
No. 4	95 - 100

4. Grade No. 4 - Maximum Nominal Size 3/8-inch (9.5 mm)

Sieve	Percentage Retained
1/2-inches	0 - 5
3/8-inches	5 - 30
No. 4	75 - 100

G. Gradation Requirements - maximum size of aggregate for structural concrete shall not exceed three inches, and shall be reduced in size to meet the following conditions:
   1. One-sixth (1/6) of the least dimension between forms of that part of the structure in which concrete is to be placed.

   2. Three-fourths (3/4) of the clear space between reinforcement.

3. The maximum size aggregate is defined as the clear space between the sides of the smallest square openings through which 95 percent of the weight of the aggregate can be passed.

4. Unless otherwise noted or restricted by above, the Grade No. 2 gradation shall be used.

2.05 PIT-RUN AGGREGATE:

A. Pit-run aggregate is the natural gravel and sand obtained from pits without the addition of other fine or coarse aggregates, and shall consist of hard, durable, uncoated pebbles or stone particles mixed with sand.

B. Pit-run aggregate shall be free from lumps of clay and injurious amounts of dust, shale, soft or flaky particles, salt and alkali.

C. Pit-run aggregate shall be well graded from coarse to fine when tested by standard laboratory methods and shall meet the following minimum requirements for percentages by weight:

1. Retained on 1/4 in sieve 55 to 60%

D. Pit-run aggregate shall not be used for high-strength concrete of 3000 psi and stronger.

E. Pit-run aggregate may be used only for concrete cushion, cradle and protection for pipe.

2.06 ADMIXTURES:

A. Concrete admixtures shall comply with Section 03320.

2.07 CONCRETE MIX DESIGN AND CONTROL:

A. Submit not less than 10 days prior to the start of concreting operations to the Engineer:

1. Mix design, using a coarse aggregate factor acceptable to the Engineer.

2. Sufficient samples of all materials to be incorporated into the mix for testing.

3. Full description of the source of supply of each material component.

B. Coarse aggregate factor:

1. Not more than 0.82 when voids less than 48%.
2. Not more than 0.85 when voids exceed 48%.
3. Not less than 0.68.

C. No changes or deviations from proportions or sources of supply without approval of Engineer.

D. No concrete may be placed on the job site until the mix design has been approved by Engineer in writing to the Contractor.

2.08 CONCRETE QUALITY:

A. Consistency:

1. Mortar shall cling to the coarse aggregate.

2. The aggregate shall not segregate during transport.

3. The concrete and mortar shall show no free water when removed from the mixer.

B. The consistency should allow the completion of all finishing operations with the addition of water to the surface.

C. The concrete shall be uniform, workable, cohesive, possess satisfactory finishing qualities and be of the stiffest consistency that can be placed and vibrated into a homogeneous mass.

D. Excessive bleeding shall be avoided.

E. Slump requirements shall be as follows:

Structural Concrete	Average Slump	Maximum* Slump
1. Cased Drilled Shafts and Thin-walled Sections (9-inches or less)	4	5
2. Slabs, Caps, Columns, Piers, wall sections over 9-inches, etc.	3	4
3. Slip Form Paving	1/2	2
4. Underwater or Seal Concrete	5	6
5. Sidewalks	4	5
6. Rip-rap, Curb, Gutter and other	As	As

Miscellaneous Surfaces	Specified by Owner	Specified by Owner

* NOTE: No concrete shall be permitted with slump in excess of the maximums shown. Any concrete mix failing to meet the above consistency requirements, although meeting the slump requirements shall be considered unsatisfactory; and the mix shall be changed to correct such unsatisfactory conditions.

F. The concrete shall comply with Table 1 below:

TABLE 1 - CLASSES OF CONCRETE

Class Of Concrete	Minimum-Maximum SX Cement Per CY	Minimum Comp. Strength 28-day PSI	Minimum Beam Strength 7-day psi ****	Maximum Water Cement Item 2.1.1 (c) (4)	Coarse Aggregate Number
A	5.0	3000	500	6.5	2-3-4
B	4.0	2000	330	8.0	2-3-4
C*	6.0	3600	600	6.0	1-2-3**
D	3.0	1500	250	11.0	2-3-4
E	6.0	3000	500	7.0	2-3
F	6.5	4200	700	5.5	2-3
H***	6.5 - 8.0	ASP	NA	5.5	3

ASP = As Specified on Plans.
*Entrained Air.
**No. 1 coarse aggregate may be used in foundations only (Except cased drilled shafts).
***Prestressed Concrete.
****ASTI C293 (Center Point).

PART 3 - EXECUTION

3.01 MIXING CONCRETE:

A. Maintain all equipment, tools, and machinery needed for timely production and delivery of concrete to jib site.

B. Mixing shall be done in a mixer of adequate size and type to produce uniform distribution of the material throughout the mass.

C. The mixer shall have a plate affixed showing the manufacturer's recommended operating data and it shall be operated within the speed and capacity limits stated thereon.

D. The absolute volume of the concrete batch shall not exceed the rated capacity of the mixer.

E. The entire contents of the drum shall be discharged before any materials are placed.

F. Improperly mixed concrete will not be placed.

G. The mixing time shall be in accordance with the recommendations of the mixer manufacturer.

H. Transit Mix Concrete:

1. Sufficient transit mix equipment shall be assigned exclusively to the project as required for continuous operation.

2. Satisfactory evidence shall be furnished so that the delivery of concrete shall be continuous at regular and uniform intervals, without stoppage or interruption.

3. Concrete shall not be placed on the job after a period of 1 hour after the cement has been placed in the mixer, with mixer turning; 30 minutes without turning.

4. All delivery trucks shall have batch tickets that clearly indicate the name of the supplier, the time the concrete was batched, the truck number, the design strength, the amount of concrete delivered in cubic yards, the amount of cement, the amount of water added at the batch plant and at the site, and the amount and type of any admixtures added to the mix.

I. Continuous Volumetric Mix Concrete:

1. A mobile, continuous, volumetric mixer of the rotating puddle type may be used for when approved by Engineer.
2. Mixers shall be designed to receive all the concrete ingredients, including admixtures, required by the mix design in a continuous uniform rate and mixed to the required consistency before discharging.

3. The mixers shall have adequate water supply and metering devices.

4. Calibration of these mixers will be required.

3.02 TESTING:

A. If directed by the Engineer, a trial batch shall be mixed for the purpose of testing the design mix. A total of two sets of four cylinders shall be obtained in accordance with ASTM C 31-95 from two separate samples of the trial batch for compressive strength tests in accordance with ASTM C 39-86. One cylinder from each set will be tested at

3 days and 7 days. The remaining two cylinders shall be tested at 28 days. The Engineer may also elect to have two sets of two beams constructed for flexural strength testing at 28 days in accordance with ASTM C 78-94.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Concrete supplied for work shown on approved plans shall be measured by the cubic yard.
B. A delivery ticket indicating the name of the supplier, the time the concrete was batched, the truck number, the design strength, the amount of concrete delivered in cubic yards, the amount of cement, the amount of water added at the batch plant and at the site, and the amount and type of any admixtures added to the mix, shall be provided to the Engineer for all deliveries.

4.02 PAYMENT:

A. The accepted quantities of supplied concrete shall be paid for at the unit bid price per cubic yard.

B. The unit bid price shall be full compensation for furnishing and mixing all concrete materials, including trial batches and delivery.

END OF SECTION

SECTION 03320

CONCRETE ADMIXTURES

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. This work shall consist of furnishing materials for use as admixtures in concrete.

PART 2 - PRODUCTS

2.01 AIR ENTRAINING ADMIXTURE:

A. An "Air Entraining Admixture" is defined as a material which, when added to a concrete mixture in the correct quantity, will entrain uniformly dispersed microscopic air.

B. This admixture shall conform to ASTM C 260, modified as follows:

1. The cement used in any series of tests shall be either the cement proposed for specific work or a "reference" Type I cement from a mill.

2. Unless otherwise indicated, the minimum relative durability factor shall be 80.

C. The air entraining admixture used in the reference concrete shall be high quality neutralized Vinsol Resin.

2.02 WATER – REDUCING, RETARDING ADMIXTURE:

A. A "Water-reducing, Retarding Admixture" is defined as a material which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency and retard the initial set of the concrete.

B. This mixture shall conform to ASTM C 494, Type A or D, modified as follows:

1. The water-reducing retarder shall retard the initial set of the plastic concrete a minimum of 2 hours and a maximum of 4 hours when the materials are at a temperature of 90 F, the dosage rate specified by the manufacturer.

2. The cement used in any series of tests shall be either the cement proposed for specific work or a "reference" Type I cement from one mill.

3. All concrete tested shall contain entrained air.

2.03 WATER – REDUCING ADMIXTURE:

A. A “Water-reducing Admixture” is defined as a material which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency and required strength.

B. This admixture shall conform to ASTM C 494, Type A.

2.04 ACCERLERATING ADMIXTURE:

A. An “Accelerating Admixture” is defined as an admixture that accelerates the setting time and the early strength development of concrete.

B. This admixture shall conform to ASTM C 494, Type C, modified as follows:

1. The accelerating admixture will contain no chlorides and shall be used in the liquid form only.

2.05 HIGH – RANGE WATER REDUCING ADMIXTURES:

A “High-range Water Reducing Admixture,” referred to as a superplastersize, is defined as a synthetic polymer material which, when added to a low slump concrete mixture increases the slump without segregation, impermeability and durability of the mix.

B. This admixture shall conform to ASTM C 494, Type F or G, modified as follows:

1. It shall reduce the required water by a minimum of 15 percent.

2. It shall increase the 7 day compressive strength of the concrete by a minimum of 25 percent.

C. The admixture when added to the mix shall produce the following:

1. Modify a low slump concrete, without the addition of water, to produce a slump which conforms to the range indicated.

2. It shall prevent a temperature rise of the mix above 100 F during high ambient conditions.

3. It shall not increase the chloride content of the mix.

2.06 CERTIFICATION:

A. The CONTRACTOR shall submit the name of the admixture proposed and manufacturer’s certification that products selected meet the requirements of this item and of ADTM C 260 and C 494 as required.

B. If more than one admixture is proposed in the concrete mix, a statement of compatibility of components shall accompany certification.

C. The ENGINEER may request additional information to be submitted such as infrared spectrophotometry scan, solids content, ph value, etc., for further identification.

D. A change in formulation discovered by any of the tests prescribed herein or other means and not reported and retested, may be cause to permanently bar the manufacturer from furnishing admixtures for City of McAllen work.

E. The ENGINEER reserves the right to perform any or all of the tests required by ASTM C 260 and C 494 as a check on the tests reported by the manufacturer.

F. In case of any variance, the ENGINEER tests will govern.

2.07 APPROVAL:

A. The ENGINEER shall approve all admixtures and dosage. Approval of admixtures shall be based on previous performance of the admixture.

B. The dosage will be determined from the manufacturer's recommendations, trial mixes or current job approved mix designs, if it is shown that no substantial change in any of the proposed ingredients has been made.

C. Should the CONTRACTOR desire to change the admixture or dosage approved during the progress of the work, the CONTRACTOR shall perform trial mixes at his own expense and submit the new mix design for approval.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS:

A. No concrete shall be delivered to the project until the mix design is approved. All concrete delivered shall conform to the approved job mix formula. Unless otherwise indicated, all concrete shall be air entrained. All admixtures will be added at the Batch Plant. All admixtures shall be in the liquid state. No admixtures shall be dispensed on dry aggregates. Each admixture shall be dispensed separately, but at the same time as the mixing water.

B. An approved job mix formula for normal hot weather concreting may not perform satisfactory for extended retardation, in which case its use will not be permitted.

C. The rotation of the mixer shall be sufficient to thoroughly mix the admixture into the concrete.

D. Admixtures shall be agitated as required to prevent separation or sedimentation of solids. Air agitation of Neutralized Vinsol Resin will not be permitted.

E. Normally Air entraining agents shall be charged into the mixer at the beginning of the batch and retarding or water reducing admixtures shall be charged into the mixer during the last part (approximately 1/3) of the batch when an air-entraining agent is used.

F. Accelerating admixtures will be used only on the written approval of the ENGINEER. Accelerating admixtures will not be permitted in bridge decks, direct traffic culvert slabs at any time nor when Type II cement is specified.

G. All admixtures shall be of the same brand from only one manufacturer for the entire project, unless otherwise approved by the ENGINEER.

H Accelerators will be used only to meet special project requirements and will require the approval of the ENGINEER.

I For individual placements of concrete of 25 cubic yards or more and for all ready-mix concrete, the admixture shall be measured and dispensed by a readily adjustable dispenser. When set to a predetermined volume, the dispenser shall fill to the preset amount and hold it positively without leakage until the operator releases the content into the mixing water by some positive means. Unless otherwise indicated, completely automatic dispensing will not be required, except for use with a fully automatic plant.

J The calibrated container shall be a measuring reservoir of the type where the level of the admixture is visible at all times. A strip gauge with one ounce increments for air entraining admixtures, ten ounce increments for dispersing admixtures, shall be attached securely to the measuring apparatus. This strip shall be a material possessing weather resistant qualities. The accuracy equipment shall visibly show the total amount to be dispensed for ready check by the ENGINEER.

K When individual placements of less than 25 cubic yards and with the concrete batched on the job site, the ENGINEER may waive the requirements for mechanical dispensing equipment.

L When high-range water reducing admixtures are indicated the following will be observed:

1. Ready-mix concrete shall be delivered in transit mixers and the capacity of the transit mixer shall be reduced for each bath by 25 percent of the rated capacity to assure proper mixing.

2. If during the placement of concrete, a change in slump resulting in a slump loss in excess of 3 inches is noted, the remaining concrete shall be rejected.

3. The addition of water will not be permitted at the job site.

4. Only one liquid admixture shall be used to achieve the desired results, except where air entrainment is indicated, the air entrainment agent will be permitted.

5. The concrete design shall meet the following requirements:

Item	Test	Value
Air entrainment	ASTM C 260	3 to 6 percent
High range water Reducing admixture	ASTM C 494 Type F or G	
Water cement ratio Gal/Sack Max.		6.25
Minimum cement content In Sacks (94 lb. Sack)		6.0
Coarse aggregate factor		6.5
Slump Maximum, inches		10
Flexural strength @ 7 days, psi		650
Maximum concrete Temperature, F		100

PART 4 - MEASUREMENT AND PAYMENT

4.01 No additional compensation will be made for the materials, equipment tests or methods required by this item, but shall be considered subsidiary to various items included in the contract.

END OF SECTION

SECTION 03330

REINFORCING STEEL

PART 1 - GENERAL

1.01 SCOPE:

This work shall consist of the furnishing and placing of reinforcing steel, deformed and smooth, of the size and quantity indicated and in accordance with these specifications.

PART 2 - PRODUCTS

2.01 BARS

A. Bar reinforcement shall be deformed and shall conform to ASTM A 615, A 616, Grades 40, 60 or 75 and shall be open-hearth, basic oxygen or electric furnace new billet steel, unless otherwise indicated. Large diameter new billet steel (Nos. 14 and 18), Grade 75, will be permitted for straight bars only.

B. Where bending of bar sizes No. 14 or No. 18 of Grades 40 or 60 is required, bend testing shall be performed on representative specimens as described for smaller bars in the applicable ASTM specification. The required bend shall be 90 degrees at a minimum temperature of 60 F around a pin having a diameter of 10 times the nominal diameter of the bar and shall be free of cracking.

C. Spiral reinforcement shall be either smooth or deformed bars or wire of the minimum diameter indicated. Bars for spiral reinforcement shall comply with ASTM A 675, A 615 or A 617. Wire shall comply with ASTM A 82. The minimum yield strength for spiral reinforcement shall be 40,000 psi.

D. In cases where the provisions of this item are in conflict with the provisions of the ASTM Designation to which reference is made, the provisions of this item shall govern.

E. Report of chemical analysis showing the percentages of carbon, manganese, phosphorus and sulfur will be required for all reinforcing steel when it is to be welded, except for drill shafts. No tack welding will be allowed. All welding shall conform to the requirements of AWS D-1-72.

F. The nominal size and area and the theoretical weight (lbs.) of reinforcing steel bars covered by these specifications are as follows:

BAR SIZE NUMBER	NOMINAL DIAMETER (INCHES)	NOMINAL AREA (SQ INCHES)	WEIGHT PER LINEAR FOOT (POUNDS)
2	0.250	0.05	0.167
3	0.375	0.11	0.376
4	0.500	0.20	0.668
5	0.625	0.31	1.043
6	0.750	0.44	1.502
7	0.875	0.60	2.044
8	1.000	0.79	2.670
9	1.128	1.00	3.400
10	1.270	1.27	4.303
11	1.410	1.56	5.313
14	1.693	2.25	7.65
18	2.257	4.00	13.60

G. Smooth bars, larger than No. 4, may be steel conforming to the above or may be furnished in any steel that meets the physical requirements of ASTM A36.

H. Smooth, round bars shall be designated by size number through No. 4. Smooth bars above No. 4 shall be designated by diameter in inches.

2.03 WELDED WIRE FABRIC

A. Wire for fabric reinforcement shall be cold-drawn from rods hot-rolled from open-hearth, basic oxygen or electric furnace billet. Wire shall conform to the requirements of the standard Specifications for Cold-Drawn Steel Wire for Concrete Reinforcement, ASTM A82 or A 496. Wire fabric, when used as reinforcement, shall conform to ASTM A 185 or A 497.

B. When wire is ordered by size numbers, the following relations between size number, diameter in inches and area shall apply unless otherwise indicated:

SIZE W NUMBER	NOMINAL DIAMETER (INCH)	NOMINAL AREA (SQ INCHES)
31	0.628	0.310
30	0.618	0.300
28	0.597	0.280
26	0.575	0.260
24	0.553	0.240
22	0.529	0.220
20	0.505	0.200
18	0.479	0.180
16	0.451	0.160
14	0.391	0.140
12	0.391	0.120
10	0.357	0.100

SIZE W NUMBER	NOMINAL DIAMETER (INCH)	NOMINAL AREA (SQ INCHES)
8	0.319	0.080
7	0.299	0.070
6	0.276	0.060
5.5	0.265	0.055
5	0.252	0.050
4.5	0.239	0.045
4	0.226	0.040
3.5	0.211	0.035
3	0.195	0.030
2.5	0.178	0.025
2	0.160	0.020
1.5	0.138	0.015
1.2	0.124	0.012
1	0.113	0.010
0.5	0.080	0.005

C. When deformed wire is required, the size number shall be preceded by D and for smooth wire the prefix W shall be shown.

2.04 CHAIRS AND SUPPORTS

A. Chairs and Supports shall be steel, precast mortar or concrete block cast in molds meeting the approval of the ENGINEER of sufficient strength to position the reinforcement as indicated when supporting the dead load of the reinforcement, the weight of the workers placing concrete and the weight of the concrete bearing on the steel.

B. Chairs shall be plastic coated when indicated.

C. Chair types and uses shall be as follows:

Structural or Architectural Elements (columns, beams, walls, slabs) feet. exposed to weather, not subjected to sand blasting, water blasting or grinding.	Galvanized steel or steel chairs with plastic coated
Structural or Architectural Elements exposed to weather and subject to sand blasting, water blasting or grinding.	Stainless steel chairs.
Structural or Architectural Elements exposed to weather or corrosive conditions.	Uncoated steel chairs.

Slabs and grade beams cast on grade. Steel chairs with a base with 9 inch^2 minimum area or sufficient area to prevent the chair from sinking into fill or subgrade. Precast mortar or concrete blocks meeting the requirements of this item may be used.

2.05 BENDING

A. The reinforcement shall be bent cold, true to the shapes indicated. Bending shall preferably be done in the shop.

B. Irregularities in bending shall be cause for rejection.

C. Unless otherwise indicated, the inside diameter of bar bends, in terms of the nominal bar diameter (d), shall be as follows:

1. Bends of 90 degrees and greater in stirrups, ties and other secondary bars that enclose another bar in the bend:

Bar Number	Grade 40	Grade 50
3, 4, 5	3d	4d
6, 7, 8	4d	5d

2. All bends in main bars and in secondary bars not covered above:

Bar Number	Grade 40	Grade 60	Grade 75
3 - 8	6d	6d	--
9, 10	8d	8d	--
11	8d	8d	8d
14, 18	10d	10d	--

2.06 STORAGE

A. Steel reinforcement shall be stored above the surface of the ground upon platforms, skids or other supports and shall be protected as far as practicable from mechanical injury and surface deterioration caused by exposure to conditions producing rust.

B. When placed in the work, reinforcement shall be free from dirt, paint, grease, oil or other foreign materials. Reinforcement shall be free from injurious defects such as cracks and laminations.

C. Rust, surface seams, surface irregularities or mill scale will not be cause for rejection, provided the minimum dimensions, cross sectional area and tensile properties of a hand wire brushed specimen meets the physical requirements for the size and grade of steel indicated.

2.07 SPLICES

A. No splicing of bars, except when indicated or specified herein, will be permitted without written approval of the ENGINEER.

B. No substitution of bars will be allowed without the approval of the ENGINEER. Any splicing of substituted bars shall conform to Table 03330-1.

C. Splices not indicted will be permitted in slabs no more than 15 inches in thickness, columns, walls and parapets, but not included for measurement, subject to the following:

1. Splices will not be permitted in bars 30 feet or less in plan length.

2. For bars exceeding 30 feet in plan length, the distance center to center of splices shall not be less than 30 feet minus 1 splice length, with no more than 1 individual bar length less than 10 feet.

3. Splices not indicated, but permitted hereby, shall conform to Table 03330-1. The specified concrete cover shall be maintained at such splices and the bars placed in contact and securely tied together.

Table 03330-1
Minimum Lap Requirements

Bar Number	Grade 40	Grade 60
3	1 foot 0 inches	1 foot 0 inches
4	1 foot 2 inches	1 foot 9 inches
5	1 foot 5 inches	2 feet 2 inches
6	1 foot 9 inches	2 feet 7 inches
7	2 feet 4 inches	3 feet 5 inches
8	3 feet 0 inches	4 feet 6 inches
9	3 feet 10 inches	5 feet 6 inches
10	4 feet 10 inches	7 feet 3 inches
11	5 feet 11 inches	8 feet 11 inches

D. Spiral steel shall be lapped a minimum of 1 turn. Bar No. 14 and No. 18 may not be lapped.

E. Welding of reinforcing bars may be used only where indicated or as permitted herein. All welding operations, processes, equipment, materials, workmanship and inspection shall conform to the requirements indicated. All splices shall be of such dimension and character as to develop the full strength of the bar being spliced.

F. End preparation for butt welding reinforcing bars shall be done in the field, except Bar No. 6 and larger shall be done in the shop. Delivered bars shall be of sufficient length to permit this practice.

G. For box culvert extensions with less than 1 foot of fill, the existing longitudinal bars shall have a lap with the new bars as shown in Table 03330-1.

H. For box extensions with more than 1 foot of fill, a minimum lap of 6 inches will be required.

I. Unless otherwise indicated, dowel bars transferring tensile stress shall have a minimum embedment equal to the minimum lap requirements shown in Table 03330-1.

J. Shear transfer dowels shall have a minimum embedment of 12 inches.

PART 3 - EXECUTION

3.01 PLACING

A. Reinforcement shall be placed as near as possible in the position indicated. Unless otherwise indicated, dimensions shown for reinforcement are to the center of the bars.

B. In the plane of the steel parallel to the nearest surface of concrete, bars shall not vary from plan placement by more than 1/12 of the spacing between bars. In the plane of the steel perpendicular to the nearest surface of concrete, bars shall not vary from plan placement by more than 1/4 inch.

C. Cover of concrete to the nearest surface of steel shall be as follows:

Item		Min. Cover (Inches)
1.	Concrete cast against and permanently exposed to earth.	3
2.	Concrete exposed to earth or weather:	
	Bar No. 6 through 18 bars	2
	Bar No. 5, W31 or D31 wire and smaller	1-1/2
3.	Concrete not exposed to weather or in contact with ground:	
	(slabs, walls, joists)	
	Bar No. 14 and 18	1-1/2
	Bar No. 11 and smaller	1
	(Beams, columns)	
	Primary reinforcement, ties, stirrups, spirals	1-1/2
	(Shells, folded plate members)	
	Bar No. 6 and larger	1
	Bar No. 5, W31 or D31 wire, and smaller	1

D. Vertical stirrups shall always pass around the main tension members and be attached securely thereto. The reinforcing steel shall be spaced its required distance from the form surface by means of approved galvanized metal spacers, metal spacers with plastic coated tips, stainless steel spacers, plastic spacers or approved precast mortar or concrete blocks. For approval of plastic spacers on a project, representative samples of the plastic shall show no visible indications of deterioration after immersion in a 5 percent solution of sodium hydroxide for 120 hours.

E. All reinforcing steel shall be tied at all intersections, except that where spacing is less than 1 foot in each direction, alternate intersections only need be tied. For reinforcing steel cages for other structural members, the steel shall be tied at enough intersections to provide a rigid cage of steel. Mats of wire fabric shall overlap each other 1 full space as a minimum to maintain a uniform strength and shall be tied at the ends and edges.

F. Where prefabricated deformed wire mats are specified or if the CONTRACTOR requests, welded wire fabric may be substituted for a comparable area of steel reinforcing bar plan, subject to the approval of the ENGINEER.

G. A suitable tie wire shall be provided in each block, to be used for anchoring to the steel. Except in unusual cases and when specifically authorized by the

ENGINEER, the size of the surface to be placed adjacent to the forms shall not exceed 2 1/2 inches square or the equivalent thereof in cases where circular or rectangular areas are provided. Blocks shall be cast accurately the thickness required and the surface to be placed adjacent to the forms shall be a true plan, free of surface imperfections.

H. Reinforcement shall be supported and tied in such a manner that sufficiently rigid cage of steel is provided. If the cage is not adequately supported to resist settlement or floating upward of the steel, overturning of truss bars or movement in any direction during concrete placement, permission to continue concrete placement will be withheld until corrective measures are taken. Sufficient measurements shall be made during concrete placement to insure compliance with the above.

I. No concrete shall be deposited until the ENGINEER has reviewed the placement of the reinforcing steel and all mortar, mud, dirt, etc., shall be cleaned from the reinforcement, forms, workers' boots and tools.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. The measurement of quantities of reinforcement furnished and placed will be based on the calculated weight of the steel actually placed as indicated, with no allowance made for added bar lengths for splices requested by the CONTRACTOR nor for extra steel used when bars larger than those indicated or with a higher grade of steel are substituted with the permission of the ENGINEER.

B. Tie wires and supporting devices will not be included in the calculated weights.

C. The calculated weight of bar reinforcement will be determined using the theoretical bar weight set forth in this item.

D. Measurement required by a change in design will be computed as described above for the actual steel required to complete the work.

4.02 PAYMENT

A. The accepted quantities of reinforcing steel will be paid for at the contract unit bid price per pound complete in place.

B. When not listed as a separate contract pay item, reinforcing steel shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.

C. Compensation, whether by contract pay item or incidental work, will be for furnishing, bending, fabricating, welding and placing reinforcement, for all clips, blocks, metal spacers, ties, chairs, wire or other materials used for fastening reinforcement in place and for all tools, labor, equipment and incidentals necessary to complete the work.

END OF SECTION

SECTION 09101

CONSTRUCTION TRAFFIC CONTROL

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. This item shall consist of the construction, manipulation, maintenance and removal, if required, of detours of the length and to the lines, grades, and typical sections indicated and providing for installing, moving, replacing, maintaining, cleaning and removing upon completion of the work, as required, all detour markers, signs, barricades and other devices used in traffic control and handling at the construction site as indicated or as directed by the ENGINEER.

B. CONTRACTOR shall be responsible for submittal of a traffic control plan sealed by a registered professional engineer in the state of Texas prior to the start of construction. CONTRACTOR shall be responsible for all traffic control measures and implementation. All proposed routing of traffic must be approved in writing prior to implementation. All traffic control devices shall be in accordance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD), latest edition.

C. This item shall also consist of providing, installing, moving, replacing, maintaining, cleaning and removing temporary or permanent street closure barricades, signs or other devices required to handle the traffic in conformance with the current edition of the Texas Manual of Uniform Traffic Control Devices for Street and Highways and as indicated or directed by the ENGINEER.

D. Implementation. Before beginning work, designate in writing a Contractor's Responsible Person (CRP) to be the representative of the Contractor who is responsible for taking or directing corrective measures of installation and maintenance deficiencies as soon as possible. The CRP must be accessible by phone and able to respond to emergencies 24 hours per day.

E. Follow the Traffic Control Plan (TCP) and install traffic control devices as shown on the plans and as directed. Install traffic control devices straight and plumb. Do not make changes to the location of any device or implement any other changes to the TCP without the approval of the Engineer. Minor adjustments to meet field constructability and visibility are allowed.

F. Submit Contractor-proposed TCP changes, signed and sealed by a licensed professional engineer, to the Engineer for approval. The Engineer may develop, sign, and seal Contractor-proposed changes. Changes must conform to guidelines established in the TMUTCD using approved products from the Texas DOT Compliant Work Zone Traffic Control Device List (CWZTCDL).

G. Maintain traffic control devices by taking corrective action as soon as possible. Corrective action includes but is not limited to cleaning, replacing, straightening, covering, or removing devices. Maintain the devices such that they are properly positioned, spaced, and legible, and that reflective characteristics meet requirements during darkness and rain.

H. Flaggers. Provide a Contractor representative who has been certified as a flagging instructor through courses offered by the Texas Engineering Extension Service, the American Traffic Safety Services Association, the National Safety Council, or other approved organizations. Provide the certificate indicating course completion when requested. This representative is responsible for training and assuring that all flaggers are qualified to perform flagging duties. A qualified flagger must be independently certified by one of the organizations listed above or trained by the Contractor's certified flagging instructor. Provide the Engineer with a current list of qualified flaggers before beginning flagging activities. Use only flaggers on the qualified list. Flaggers must be courteous and able to effectively communicate with the public. When directing traffic, flaggers must use standard attire, flags, signs, and signals and follow the flagging procedures set forth in the TMUTCD.

I. Removal. Upon completion of work, remove all barricades, signs, cones, lights, and other traffic control devices used for work-zone traffic handling, unless otherwise shown on the plans.

PART 2 - PRODUCTS

2.01 CONSTRUCTION TRAFFIC CONTROL SIGNS:

A. Construction traffic control signs shall conform to the State of Texas DOT Manual of Uniform Traffic Control Devices, Parts 5 & 6 unless otherwise directed by the ENGINEER.

B. The substrate for construction signs need only be sufficiently durable to last the life of the project and sufficiently rigid to hold the sheeting in a flat plane.

2.02 SIGN SUPPORTS:

A. Supports for construction traffic control signs shall be grade #2 fir or yellow pine, pressure treated with pentachlorophenol.

B. Supports shall have a minimum nominal size of 4-inches x 4-inches and conform to the details shown on the plans.

2.03 PORTABLE SIGN SUPPORT:

A. Materials for portable sign supports shall comply with the details shown on the plans. Portable sign supports other than those shown on the plans shall be submitted to the ENGINEER for approval prior to use.

2.04 BARRICADES:

A. Barricades shall be classified as Type I, Type II, or Type III and shall comply with the details shown on the plans and the TMUTCD.

B. Barricade rails shall be fabricated using grade #2 fir or yellow pine and reflectorized sheeting conforming to the requirements shown in Section 2.08(5).

2.05 VERTICAL PANELS:

A. Materials for vertical panels shall conform to the details shown on the plans. Vertical panels shall be reflectorized with orange and white reflective sheeting or tape in accordance with the requirements of the TMUTCD and Table 9000-3.

2.06 CONSTRUCTION TRAFFIC MARKINGS:

A. Construction traffic markings shall comply with Section 9101 and the details shown in the plans.

2.07 ABBREVIATED PAVEMENT MARKINGS FOR CONSTRUCTION:

A. The pavement-marking material shall consist of an adhesive-backed reflective tape that can be applied to the pavement. Markings shall be of good appearance, have straight, unbroken edges and have a color that complies with all federal regulations.

1. Color

a) The markings, as well as retro-reflected light from the markings, shall be white or yellow as indicated.

2. Visibility

a) The pavement markings (during daylight hours) shall be distinctively visible for a minimum of 300 feet unless sight distance is restricted by geometric roadway features.

b) The pavement markings (when illuminated by automobile low beam headlights at night) shall be distinctly visible for a minimum of 160 feet unless sight distance is restricted by geometric features.

c) The above day and night visibility requirements shall be met when viewed from an automobile traveling on the roadway.

2.08 CHANNELIZATION DEVICES:

A. Barrels

1 Barrels shall be of metal or nonmetal composition approved by the ENGINEER and of 30 to 55 gallon capacity. Only one size may be used on the project. The barrels shall be reflectorized with orange and white reflective sheeting or tape in accordance with the requirements of TMUTCD. The markings on the barrels shall be horizontal, circumferential, orange, and wide. There shall be a minimum of 5 alternating orange and white stripes on each barrel. Barrels shall also conform to the details shown on the plans.

2. Type "B" barrels shall be equipped with either Type "A" low intensity or Type "C" steady-burn warning lights complying with the provisions to TMUTCD and the Institute of Transportation Engineers (ITE) standard for flashing and steady-burn lights. The use of warning lights shall be as directed by the ENGINEER.

B. Traffic Cones

1. Traffic cones shall conform to the details shown on the plans.

C. Tubular Traffic Markers

1. Post

a) The post shall be of a thermoplastic or pliable elastomeric composition meeting the manufacturer's requirements.

b) Properties:

Outside Diameter…....2.23 inches to 4 inches
Wall Thickness…….0.125 inches min.
Length…….18 to 36 inches
Color……...Orange

2. Base

a) The base shall be of a thermoplastic or pliable elastomeric composition meeting the manufacturer's requirements.

b) Properties:
Height :……1/2 to 2 inches
Outside Diameter:……7 to 12 inches
Color: …… black or same color as post

3. Assembly Units

a) Assembly units which are inherent with the particular marker shall be as per manufacturer's recommendations.

4. Adhesives

a) Adhesive shall be epoxy type (temporary installation, permanent installation or butyl type) as per manufacturer's recommendations.

b) Other methods approved by the ENGINEER prior to initiating the work may be used; however, said approval does not abrogate the CONTRACTOR'S responsibility of effecting the temporary or permanent installation.

5. Reflectorization

a) If used at night, tubular traffic markers shall have two 3-inch, circumferential reflective bands, no more than 2-inches from the top with no more than 6-inches separating the bands. Reflective material shall be SIA-250 or higher sheeting conforming to the provisions of Section 9000. The color of reflective material shall be as shown in the plans.

2.09 SEQUENTIAL ARROW DISPLAYS

A. Sequential arrow displays shall be sequentially lighted and roof or trailer mounted. The minimum panel size shall be 30-inches high an 54-inches wide. The display shall have 22 hooded sealed beam amber lamps rated at a maximum intensity of 8800 candlepower.

B. Light intensity shall be adjustable by dimmer switch. The operating modes shall be as follows:

1 Pass Left. 3 chevrons of 5 lamps each sequence in right to left pattern, 40 to 50 times per minute.

2 Pass Right. 3 chevrons of 5 lamps each sequence in left to right pattern, 40 to 50 times per minute.

3 Pass Either Side. The two outermost chevrons on each end of the panel pointing like arrowheads and flashing 40 to 50 times per minute with crossing row of lamps burning continuously.

4 Warning. 4 lamps, one at each corner of the panel, flashing 40 to 50 times per minute.

2.10 MATERIALS FOR CONSTRUCTION DETOURS

A. Flexible Base

1. Flexible base shall conform to Section 02601.

B. Prime Coat

1. Prime Coat shall conform to Section 02610.

C. Seal Coat

1. Seal Coat shall conform to Section 02617.

D. Hot Mix Asphaltic Concrete Pavement

1. Hot Mix shall be Type D conforming to Section 02612.

E. Seeding

1. Seeding shall conform to Section 02936.

PART 3 - EXECUTION

3.01 CONSTRUCTION TRAFFIC CONTROL SIGNS AND SIGN SUPPORTS:

A. Construction traffic control signs and sign supports shall be installed at locations noted on the plans in conformance with the TMUTCD or as directed by the ENGINEER.

3.02 PORTABLE SIGN SUPPORTS:

A. Portable sign supports for traffic control devices for detours shall be furnished by the CONTRACTOR or shall be installed at the locations shown on the plans, and shall remain the property of the CONTRACTOR.

B. Unless otherwise specified, portable sign supports shall be of the dimensions shown on the plans.

3.03 BARRICADES:

A. Barricades shall be installed in conformity with the details noted on the plans or as directed by the ENGINEER.

3.04 VERTICAL PANELS:

A. Vertical panels shall be installed in conformity with the details noted on the plans or as directed by the ENGINEER.

3.05 CONSTRUCTION TRAFFIC MARKINGS:

A. Construction traffic markings shall be installed in conformity with TxDOT MUTCD, Part 5, Section 5E.01 and the details shown on the plans or as directed by the ENGINEER.

3.06 ABBREVIATED PAVEMENT MARKING FOR CONSTRUCTION:

A. Abbreviated markings meeting all specification requirements shall be in place on all roadways on which traffic is allowed and where suitable standard pavement marking is not in place. The transverse location of the line(s) formed by the markings shall be as determined by the ENGINEER.

B. Unless otherwise indicated, the abbreviated markings shall be placed as follows:

Condition	**Spacing**	**Length of Stripe**
Straight	40 feet approximately	48 inch
Curve greater than 2 degrees	20 feet maximum	48 inch
Curve less than or equal 2 degrees	40 feet maximum	48 inch

C. Pavement markings shall be a minimum of 3-7/8 inches wide. Length and spacing will be in accordance with these specifications.

D. The spacing of stripes may be modified by the ENGINEER. However, the maximum spacing specified above shall not be exceeded in any case.

E. The CONTRACTOR will be responsible for maintaining the abbreviated pavement markings until standard pavement markings are in place.

F. Abbreviated pavement markings shall be removed after all permanent markings have been placed.

3.07 CHANNELIZATION DEVICES:

A. Type "A" Barrels

1. Type "A" barrels shall be used during daylight hours only and shall not be equipped with warning lights of any type. The term "daylight hours" refers to those hours between dawn and dusk.

B. Type "B" Barrels

1. Type "B" barrels shall be equipped with warning lights. Type "B" barrels shall be used during nighttime hours only, unless otherwise shown on the plans or directed by the Project Manager. The term "nighttime hours" refers to those hours between dusk and dawn.

C. Traffic Cones

1. Traffic cones shall be installed in conformity with the plans and the TMUTCD or as directed by the ENGINEER.

D. Tubular Traffic Markers

1. The metal, concrete, or bituminous surface where the tubular traffic markers are to be placed shall be thoroughly cleaned.

2. Metal and concrete surfaces shall be sandblasted or wire brushed. Bituminous surfaces shall be cleaned in accordance with manufacturer's recommendations.

3. All loose sand, dust and other deleterious debris from cleaned mounting surfaces shall be removed.

4. Tubular traffic markers shall be installed in conformity with details and at locations shown on the plans or as directed by the ENGINEER and in accordance with the manufacturer's recommendation.

5. In the event that removal of an installation (temporary or permanent) is effected and the metal, concrete, or bituminous surface is damaged the CONTRACTOR shall repair and otherwise restore said surface to its original condition at no additional cost to the City.

6. All defective post(s), base(s), assembly unit(s), adhesive(s), or reflective sheeting contributing to the detriment of the intended function of the tubular traffic markers shall be replaced by the CONTRACTOR at no additional cost to the City.

E. Channelization devices shall be installed and of the type in accordance with the details shown on the plans. Barrels shall be as noted herein.

3.08 SEQUENTIAL ARROW DISPLAY:

A. Sequential arrow displays shall be used according to the requirements shown on the plans and as shown in TxDOT MUTCD.

3.09 CONSTRUCTION DETOURS:

A. The detours shall be constructed at the locations and to the lines and grades indicated. It shall be the entire responsibility of the CONTRACTOR to provide for the passage of traffic in comfort and safety without creating a dust problem.

3.10 CONSTRUCTION METHODS:

B. Prior to commencing construction, suitable "Construction Traffic Control" devices shall be installed to protect the workers and the public.

C. The CONTRACTOR shall be responsible for installing all markers, signs and barricades conforming to The Texas Manual on Uniform Traffic Control Devices and/or as indicated. If, in the opinion of the ENGINEER, additional markers, signs or barricades are needed in the interest of safety, the CONTRACTOR will install such as are required or as directed by the ENGINEER.

3.11 MAINTENANCE:

A. It shall be the CONTRACTOR'S responsibility to maintain, clean, move and replace if necessary, barricades, signs and traffic handling devices during the time required for construction of the project. Permanent barricades shall be constructed as required after the completion of the streets by drilling holes to place the posts and concrete foundations. Foundation concrete shall be cured before the rails are attached.

B. When no longer needed, all temporary barricades, signs and traffic handling devices shall be removed and the area restored to its original condition or as directed by the ENGINEER.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Measurement of various items described in this specification, complete in place, will be made as follows:

1. Construction traffic control sign assemblies, consisting of the applicable signage mounted on either sign supports or portable sign supports, shall be measured per each or lump sum.

2. Barricades shall be measured by the type per each.

3. Vertical panels shall be measured per each. Supports required for vertical panels will not be measured for payment but will be considered incidental to the completion of the work.

4. Construction traffic markings shall be measured per linear foot.

5 Abbreviated pavement markings for construction shall be measured per linear foot.

6 Channelization devices shall be measured per each for the category and type shown.

7. Sequential arrow display shall be measured per each.

8. Construction detours shall be measured per each or considered incidental to completion of construction.

9. Construction traffic control plan, consisting of any or all of the items described herein, shall be measured lump sum or incidental to completion of construction.

4.02 PAYMENT:

A. The accepted quantities of construction traffic control devices shall be paid at the contract unit bid price per the unit of measurement noted above or as noted on the bid proposal.

B. Compensation will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

END OF SECTION

N. DRAWINGS

Set No.: ____

PROJECT DIRECTORY

PROJECT OWNER
CITY OF McALLEN
PARKS & RECREATION DEPT.
1000 S. WARE ROAD
McALLEN, TEXAS. 78501

CIVIL ENGINEER
MARIO A. CRUZ
CITY OF McALLEN
ENGINEERING DEPARTMENT
311 NORTH 15 th. ST.
McALLEN TEXAS. 78501



LICENSED IRRIGATOR
JOSE L. DE LA PAZ
CITY OF McALLEN
PARKS & RECREATION DEPT.
1000 S. WARE ROAD
McALLEN, TEXAS. 78501

DBR
EDWARD PUENTES,PE
OPERATIONS MANAGER
200 SOUTH 10th. STREET
SUITE 901
McALLEN, TEXAS. 78501

CITY OF McALLEN

PARKS AND RECREATION DEPARTMENT

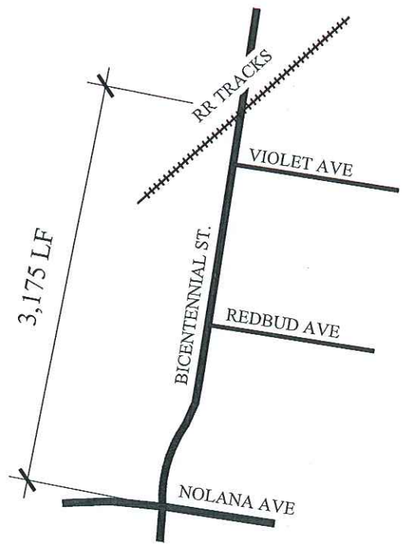
BICENTENNIAL HIKE & BIKE TRAIL

Beautification Project - Nolana to RR Tracks
McALLEN, TEXAS

CITY OFFICIALS

JAMES E. DARLING	MAYOR
AIDA RAMIREZ	MAYOR PRO-TEM AND COMMISSIONER DISTRICT 4
JAVIER VILLALOBOS	COMMISSIONER DISTRICT 1
JOAQUIN J. ZAMORA	COMMISSIONER DISTRICT 2
J. OMAR QUINTANILLA	COMMISSIONER DISTRICT 3
JOHN INGRAM	COMMISSIONER DISTRICT 5
VERONICA WHITACRE	COMMISSIONER DISTRICT 6
ROEL RODRIGUEZ, P.E.	CITY MANAGER
MIKE HERNANDEZ	DIRECTOR PARKS & RECREATION DEPARTMENT

LOCATION MAP



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CVR	COVER

CIVIL

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C2	PARKING NODE PROJECT LAYOUT
C3	PARKING NODE PAVING PLAN
C4	PARKING NODE GRADING AND DRAINAGE PLAN
C5	PARKING NODE PAVEMENT MARKING PLAN
C5A	PARKING NODE MISCELLANEOUS IMPROVEMENTS - NORTH
C6	PARKING NODE DETAILS
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L4	STA. 22+00 TO STA. 32+00
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L7	SITE ENLARGEMENTS
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IRRIGATION

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IR 3	BUBBLER IRRIGATION IMPROVEMENTS STA. 12+00 TO STA. 22+00
IR 4	BUBBLER IRRIGATION IMPROVEMENTS STA. 22+00 TO STA. 32.00
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IR9	SPRAY IRRIGATION IMPROVEMENTS STA. 22+00 TO STA. 32+00
IR 10	SPRAY IRRIGATION IMPROVEMENTS STA. 32+00 TO STA. 40+00
IR11	IRRIGATION NOTES
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ELECTRICAL

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E 1.3	ENLARGED PLAN STA 22+00 TO STA. 32+00
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E 1.5	ELECTRICAL NOTES
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Bicentennial Hike & Bike Trail Beautification Project

LAYOUT NAME: Cover
DATE: MAY 08, 2018 - 11:40PM
LAST SAVED: MAY 08, 2018 - 1:45PM
DRAWING FILE: I:\BICENTENNIAL\2017-BICENTENNIAL NOLANA TO RR TRACKS\CAD FILES\LANDSCAPE\CVR.DWG

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CURRENT CITY OF MCALLEN STANDARD CONSTRUCTION DETAILS AND TECHNICAL SPECIFICATIONS.

2. THE CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL DIMENSIONS AND THE LOCATION OF EXISTING AND PROPOSED PROJECT ELEMENTS PRIOR TO CONSTRUCTION. ANY DISCREPANCIES BETWEEN PLAN DIMENSIONS AND ACTUAL FIELD CONDITIONS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER. NO CONSTRUCTION ACTIVITY SHALL CONTINUE WITHOUT APPROVAL FROM THE CITY OF MCALLEN ENGINEERING DEPARTMENT.

3. THE TYPE, SIZE AND LOCATION OF ALL UNDERGROUND UTILITIES DEPICTED ON THE CONSTRUCTION PLANS WERE RESEARCHED WITH RESPECT TO THE BEST AVAILABLE DATA AND THEREFORE SHOWN APPROXIMATE. ALTHOUGH EVERY EFFORT HAS BEEN MADE TO ACCURATELY DEPICT ALL UTILITIES, NOT ALL (PUBLIC AND PRIVATE) MAY BE SHOWN. NEITHER THE ENGINEER NOR CITY OF MCALLEN IS RESPONSIBLE FOR THE ACCURACY OF THE LOCATION OF THE UTILITIES SHOWN ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT ALL UTILITY COMPANIES WITH JURISDICTION WITHIN THE LIMITS OF CONSTRUCTION FOR FIELD VERIFICATION AT NO ADDITIONAL EXPENSE TO THE CITY OF MCALLEN.

   UTILITY CONTACTS INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

   CITY OF MCALLEN ENGINEERING DEPARTMENT 956-681-1151
   CITY OF MCALLEN WATERLINE MAINTENANCE 956-681-1662
   CITY OF MCALLEN WASTEWATER SYSTEMS 956-688-3380
   TEXAS GAS SERVICE 1-800-700-2443
   HESCO 956-330-4758
   AMERICAN ELECTRIC AND POWER (AEP) 956-382-2369
   MAGIC VALLEY ELECTRIC COOPERATIVE (MVEC) 956-289-4049
   TIME WARNER CABLE (TWC) 956-365-6642
   AT&T956-630-8261
   TEXAS 811
   HIDALGO COUNTY DRAINAGE DISTRICT NO. 1 956-292-7080
   HIDALGO COUNTY IRRIGATION DISTRICT NO. 1 956-383-3886
   HIDALGO COUNTY IRRIGATION DISTRICT NO. 2 956-787-1422
   HIDALGO COUNTY WATER IMPROVEMENT DISTRICT NO. 3 956-686-8303

4. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING NEAR EXISTING UTILITIES. DAMAGES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. ALL COSTS FOR INTERRUPTION OF GAS, ELECTRICAL, COMMUNICATIONS AND/OR WATER SERVICE RESULTING FROM RELATED CONSTRUCTION ACTIVITY SHALL BE BORNE BY THE CONTRACTOR.

5. THE CONTRACTOR SHALL EXPOSE ANY EXISTING UTILITY THAT MAY BE IN CONFLICT PRIOR TO COMMENCING CONSTRUCTION.

6. THE CONTRACTOR SHALL NOTIFY ALL AUTHORIZED INSPECTORS, SUPERINTENDENTS, OR PERSONS RESPONSIBLE FOR PUBLIC AND PRIVATE UTILITIES AFFECTED BY HIS/HER OPERATIONS PRIOR TO COMMENCING CONSTRUCTION.

7. THE CONTRACTOR SHALL NOTIFY THE CITY OF MCALLEN ENGINEERING DEPARTMENT 48-HOURS PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITY.

8. THE CONTRACTOR IS ENCOURAGED TO INSPECT AND DOCUMENT THE PRE-CONSTRUCTION CONDITION OF ALL PRIVATE DRIVEWAYS, MAILBOXES, PAVEMENT AREAS, SIDEWALKS, CURB & GUTTER THAT IS TO BE AFFECTED BY PROPOSED CONSTRUCTION PRIOR TO COMMENCING.

9. ANY DAMAGE TO EXISTING STRUCTURES SHALL BE REPAIRED TO PRE-CONSTRUCTION CONDITION OR BETTER AT THE CONTRACTOR'S EXPENSE. EXISTING STRUCTURES MAY INCLUDE BUT ARE NOT LIMITED TO PAVEMENT, INLETS, MANHOLES, FENCES, SPRINKLER SYSTEMS, LAWNS, SIDEWALKS OR PRIVATE PROPERTY.

10. ALL WORK SHALL BE PERFORMED WITHIN CITY OF MCALLEN RIGHTS-OF-WAY, EASEMENTS OR ON CITY-OWNED PROPERTY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN PERMISSION TO USE PRIVATE PROPERTY FOR THE PURPOSES OF STAGING, STOCKPILE, STORAGE OR REFUSE AREAS. THE CONTRACTOR SHALL PROVIDE WRITTEN EVIDENCE TO THE CITY OF MCALLEN ENGINEERING DEPARTMENT PRIOR TO USE.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION AND AT HIS/HER EXPENSE.

12. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING ALL CONSTRUCTION MATERIALS TESTING AND GENERAL INSPECTIONS. THE CONTRACTOR SHALL COORDINATE THROUGH THE CITY OF MCALLEN'S DESIGNATED FIELD REPRESENTATIVE A MINIMUM OF 24-HOURS PRIOR TO TESTING OR INSPECTION. FAILURE TO BE PREPARED FOR TESTING MAY RESULT IN TRAVEL CHARGES. RE-TESTING WILL BE BORNE BY THE CONTRACTOR.

13. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED RESIDENTS OR BUSINESS OWNERS OF CONSTRUCTION ACTIVITY THOUGH THE USE OF BI-LINGUAL DOOR TAGS, PAMPHLETS OR SIMILAR METHODS. ALL AFFECTED PARTIES MUST BE NOTIFIED A MINIMUM OF 48-HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE A SAMPLE OF THE NOTIFICATION TO CITY OF MCALLEN ENGINEERING DEPARTMENT PRIOR TO IMPLEMENTATION.

14. THE CONTRACTOR SHALL AT ALL TIMES ALLOW ACCESS TO EXISTING DRIVEWAYS OR PROVIDE/MAINTAIN ALTERNATIVE ALL-WEATHER ROUTES.

15. THE CONTRACTOR SHALL ENSURE SAME DAY ACCESS TO ALL RESIDENCES AND BUSINESSES AFFECTED BY THE CONSTRUCTION ACTIVITY.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ASSOCIATED CONSTRUCTION STAKING AND SURVEYING UNLESS NOTED OTHERWISE.

17. THE CONTRACTOR SHALL DO ALL NECESSARY CLEARING, EXCAVATION, TRENCHING, DE-WATERING, DEMOLITION, GRADING, BACKFILLING, ETC. TO COMPLETE THE PROJECT. ASSOCIATED COSTS SHALL BE SUBSIDIARY TO THE RESPECTIVE BID ITEMS AS IDENTIFIED IN THE CONTRACT UNLESS NOTED OTHERWISE.

18. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE ALL EXCAVATED MATERIAL, EXCESS CONCRETE, AND DEBRIS FROM THE CONSTRUCTION SITE AT NO ADDITIONAL EXPENSE TO THE CITY OF MCALLEN.

19. THE CONTRACTOR SHALL KEEP THE CONSTRUCTION AREA AS CLEAN A POSSIBLE. ALL ASSOCIATED DEBRIS SHALL BE COLLECTED AND PROPERLY DISPOSED OF AT THE END OF EACH WORKDAY.

20. THE CONTRACTOR SHALL INSPECT ALL MATERIALS AT DELIVERY AND NOTIFY THE CITY OF MCALLEN ENGINEERING DEPARTMENT OF ANY DAMAGED OR QUESTIONABLE MATERIALS. ANY INSTALLED DAMAGED OR QUESTIONABLE MATERIAL WITHOUT PRIOR INSPECTION BY THE CITY SHALL BE REMOVED AT THE CONTRACTOR'S EXPENSE.

21. ALL PAVEMENTS SHALL BE NEATLY SAW-CUT. DAMAGE TO PAVEMENT BEYOND THE EXTENTS OF TRENCH WIDTHS AS A RESULT OF FAILURE TO PROPERLY SAW-CUT SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

22. ALL COMPACTION SHALL BE ACHIEVED BY MECHANICAL METHODS. NO WATER JETTING ALLOWED.

23. THE CONTRACTOR SHALL IMPLEMENT WARNING DEVICES SUCH AS SIGNAGE, LIGHTS AND SIGNALS TO ENSURE THE SAFETY OF THE PUBLIC AND HIS/HER PERSONNEL AT NO ADDITIONAL EXPENSE TO THE CITY OF MCALLEN.

24. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND/OR SAFETY OF THE CONSTRUCTION SITE, SITE PERSONNEL, SUBCONTRACTORS, MATERIALS AND EQUIPMENT.

25. THE CONTRACTOR SHALL RETURN THE SITE TO ORIGINAL GRADES UNLESS FINISHED GRADES SHOW OTHERWISE ON THE CONSTRUCTION PLANS. THE CONTRACTOR SHALL ENSURE NO AREAS OF PONDING AREA PRESENT.

26. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING ALL FIELD CHANGES AND FURNISHING A LEGIBLE SET OF "AS-BUILT" DRAWINGS TO THE CITY OF MCALLEN ENGINEERING DEPARTMENT.

TRAFFIC CONTROL

1. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN FOR APPROVAL BY THE CITY OF MCALLEN ENGINEERING DEPARTMENT PRIOR TO CONSTRUCTION. THE TRAFFIC CONTROL PLAN SHALL BE PREPARED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS.

2. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), LATEST EDITION.

3. THE CONTRACTOR SHALL PLAN AND SEQUENCE ALL CONSTRUCTION ACTIVITY IN SUCH A MANNER THAT WILL PERMIT SAFE PEDESTRIAN AND VEHICULAR MOVEMENT.

TRENCH SAFETY

1. IN ACCORDANCE WITH HOUSE BILLS 662 AND 665 ENACTED BY THE TEXAS LEGISLATURE (70TH REGULAR LEGISLATIVE SESSION), THE CONTRACTOR SHALL MEET THE REQUIREMENTS FOR TRENCH SAFETY AS OUTLINED IN THE CURRENT VERSION OF THE UNITED STATES DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS, 29 CFR, PART 1926, SUBPART P- EXCAVATIONS.

2. PRIOR TO COMMENCING ANY EXCAVATION, THE CONTRACTOR SHALL PROVIDE A TRENCH SAFETY PLAN AS APPLICABLE. ALL PLANS SHALL BE PREPARED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS. THE PLAN SHALL BE SUBMITTED TO THE CITY OF MCALLEN ENGINEERING DEPARTMENT FOR APPROVAL.

3. IN THE EVENT CONDITIONS ENCOUNTERED IN THE FIELD REQUIRE TRENCH SAFETY SYSTEMS OUTSIDE OF THE EXTENTS SUGGESTED TRENCH PROTECTION SHOWN ON THE CONSTRUCTION PLANS, ALL EXCAVATION SHALL CEASE AND THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CITY OF MCALLEN ENGINEERING DEPARTMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING A REVISED TRENCH SAFETY PLAN. NO EXCAVATION SHALL RESUME UNTIL THE REVISED TRENCH SAFETY PLAN HAS BEEN APPROVED.

4. THE CONTRACTOR SHALL ENSURE APPROVED TRENCH SAFETY PLANS ARE IMPLEMENTED. FAILURE TO ADHERE TO THE TRENCH SAFETY PLAN WILL RESULT IN A STOP WORK ORDER. NON-COMPLIANCE INCIDENTS MAY BE REPORTED TO OHSA.

5. TRENCHES OR EXCAVATIONS MAY NOT BE LEFT OPEN OVERNIGHT UNLESS AUTHORIZED IN WRITING BY THE CITY OF MCALLEN ENGINEERING DEPARTMENT. IN CASES WHERE TRENCHES ARE LEFT OPEN, THE CONTRACTOR MUST PROVIDE TRAFFIC-RATED, ANCHORED STEEL PLATE COVERS APPROVED BY THE DEPARTMENT.

DRAINAGE

1. ALL REINFORCED CONCRETE PIPE SHALL BE ASTM C-76 CLASS III (RUBBER JOINT) UNLESS NOTED OTHERWISE ON THE PLANS. ALL PIPE AND APPURTENANCES (INLETS, MANHOLES, JUNCTION BOXES, ETC.) SHALL CONFORM TO THE CITY OF MCALLEN TECHNICAL SPECIFICATIONS.

2. BEDDING MATERIAL SHALL CONSIST OF PIT RUN GRAVEL WITH A MAXIMUM SIZE OF 3/4 INCHES OR APPROVED SUBSTITUTE AND SHALL EXTEND TO THE SPRING LINE OF THE PIPE.

3. REINFORCED CONCRETE PIPES SHALL EXTEND TO THE INSIDE FACE OF ALL STRUCTURES. ALL JOINTS SHALL BE GROUTED TO ENSURE A WATER-TIGHT FIT. IN NO INSTANCE SHALL GROUT BE USED TO EXTEND AN INCOMPLETE SEGMENT OF PIPE TO THE INSIDE FACE OF A STRUCTURE.

4. SAND BACKFILL IN LIEU OF NATIVE MATERIAL IS ALLOWED AT THE CONTRACTOR'S DISCRETION; NO SEPARATE PAY. THE CONTRACTOR SHALL SUBMIT A SAMPLE OF THE BACKFILL MATERIAL TO THE CITY OF MCALLEN ENGINEERING DEPARTMENT FOR INSPECTION AND SHALL UTILIZE THE MATERIAL ONLY UPON APPROVAL BY THE DEPARTMENT.

5. EXPANSION JOINTS ARE REQUIRED BETWEEN ALL INLET STRUCTURES AND CURB AND GUTTER AND/OR SIDEWALK.

6. ALL MANHOLE COVERS SHALL DISPLAY THE CITY OF MCALLEN LOGO AND STORM SEWER DESIGNATION. MANHOLE COVERS IN TRAVELED WAYS SHALL BE H-20 RATED.

7. THE CONTRACTOR SHALL ENSURE THAT ALL EXISTING STORM SEWER INFRASTRUCTURE REMAINS FUNCTIONAL THROUGHOUT THE COURSE OF CONSTRUCTION. IN THE EVENT THAT ANY ASSOCIATED CONSTRUCTION ACTIVITY IMPEDES THE FUNCTION OF A SYSTEM, THE CONTRACTOR SHALL PROVIDE THE CITY OF MCALLEN ENGINEERING DEPARTMENT A PLAN TO ADDRESS THE ISSUE IN ANTICIPATION OF A STORM EVENT.

8. ALL NEWLY INSTALLED STORM SEWER PIPE AND APPURTENANCES ARE SUBJECT TO VIDEO INSPECTION.

9. CONTRACTOR SHALL MATCH PROPOSED TOP OF STRUCTURE ELEVATIONS TO EXISTING PAVEMENT/FINISHED GRADES IF DISCREPENCIES EXIST TO PROPOSED PLAN ELEVATIONS.

EROSION CONTROL NOTES

1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE PRIOR TO COMMENCING ANY EARTH DISTURBING ACTIVITY.

2. ALL EFFORTS SHALL BE MADE TO CONTAIN DISTURBED SOILS WITHIN THE EXTENTS OF PERIMETER EROSION AND SEDIMENT CONTROL MEASURES.

3. THE CONTRACTOR SHALL SEQUENCE ALL CONSTRUCTION IN SUCH A MANNER AS TO MINIMIZE THE AMOUNT AND EXTENTS OF DISTURBED EARTH.

4. A STABILIZED CONSTRUCTION EXIT IS REQUIRED AT ALL POINTS OF DESIGNATED EGRESS FROM THE LIMITS OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE LOCATION(S) UNLESS OTHERWISE NOTED ON THE PLANS. THE LOCATION(S) OF THE STABILIZED CONSTRUCTION EXIT(S) MAY BE MODIFIED WITH RESPECT TO THE SEQUENCE OF CONSTRUCTION.

5. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROPERLY MAINTAINED DURING THE COURSE OF THEIR INTENDED USE.

6. ALL STAGING, MATERIAL STORAGE, STOCKPILE AND REFUSE AREAS SHALL REQUIRE APPLICABLE EROSION AND SEDIMENT CONTROL MEASURES.

7. ALL CONSTRUCTION DEBRIS SHALL BE CONTAINED WITHIN APPROPRIATE RECEPTACLES (ROLL-OFF CONTAINERS, DUMPSTERS, TRASH CANS, WIRE-MESH CAGES, ETC.) AND CONFINED WITHIN PERIMETER EROSION AND SEDIMENT CONTROLS.

8. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE DURING THE COURSE OF EARTH DISTURBING ACTIVITY AND UNTIL FINAL STABILIZATION IS ACHIEVED. STRUCTURAL MEASURES MAY BE REMOVED ONLY UPON FINAL PROJECT ACCEPTANCE BY THE CITY OF MCALLEN ENGINEERING DEPARTMENT OR AS DIRECTED BY THE ENGINEER.

9. PERMANENT STABILIZATION SHALL BEGIN AS SOON AS PRACTICABLE OR AS DIRECTED BY THE CITY OF MCALLEN ENGINEERING DEPARTMENT OR ENGINEER.

10. THE CONTRACTOR MAY REFER TO THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES (2004 EDITION) ITEM 164, "SEEDING FOR EROSION CONTROL" AND ITEM 168, "VEGETATIVE WATERING" FOR VEGETATIVE STABILIZATION SPECIFICATIONS.

11. DUST CONTROL SHALL BE IMPLEMENTED AS NECESSARY OR AS DIRECTED BY THE ENGINEER. DUST CONTROL MAY CONSIST OF WATERING OR OTHER METHODS APPROVED BY THE CITY OF MCALLEN ENGINEERING DEPARTMENT OR ENGINEER.

12. TRACKED DEBRIS SHALL BE SWEPT AT THE END OF EACH WORKDAY OR AS DIRECTED BY THE CITY OF MCALLEN ENGINEERING DEPARTMENT.

13. ALL DISCHARGES ASSOCIATED WITH DEWATERING OPERATIONS SHALL IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES. MEASURES MAY INCLUDE BUT ARE NOT LIMITED TO SEDIMENTATION BASINS OR FILTER SOCKS.

14. CONCRETE WASH-WATER SHALL NOT BE DISCHARGED DIRECTLY INTO A STORM SEWER SYSTEM OR RECEIVING STREAM. ALL WASH ACTIVITIES MUST BE PERFORMED WITHIN THE EXTENTS OF ESTABLISHED EROSION AND SEDIMENT CONTROL MEASURES OR DESIGNATED AREAS APPROVED BY THE CITY OF MCALLEN ENGINEERING DEPARTMENT.

15. SEDIMENT SHALL BE CLEARED FROM ALL STORM SEWER PIPES, CULVERTS AND APPURTENANCES WITHIN THE LIMITS OF CONSTRUCTION PRIOR TO FINAL PROJECT ACCEPTANCE. SEDIMENT SHALL BE PROPERLY DISPOSED.

STATE OF TEXAS
MARIO A. CRUZ
96398
LICENSED
PROFESSIONAL ENGINEER

P.E.
07/06/18

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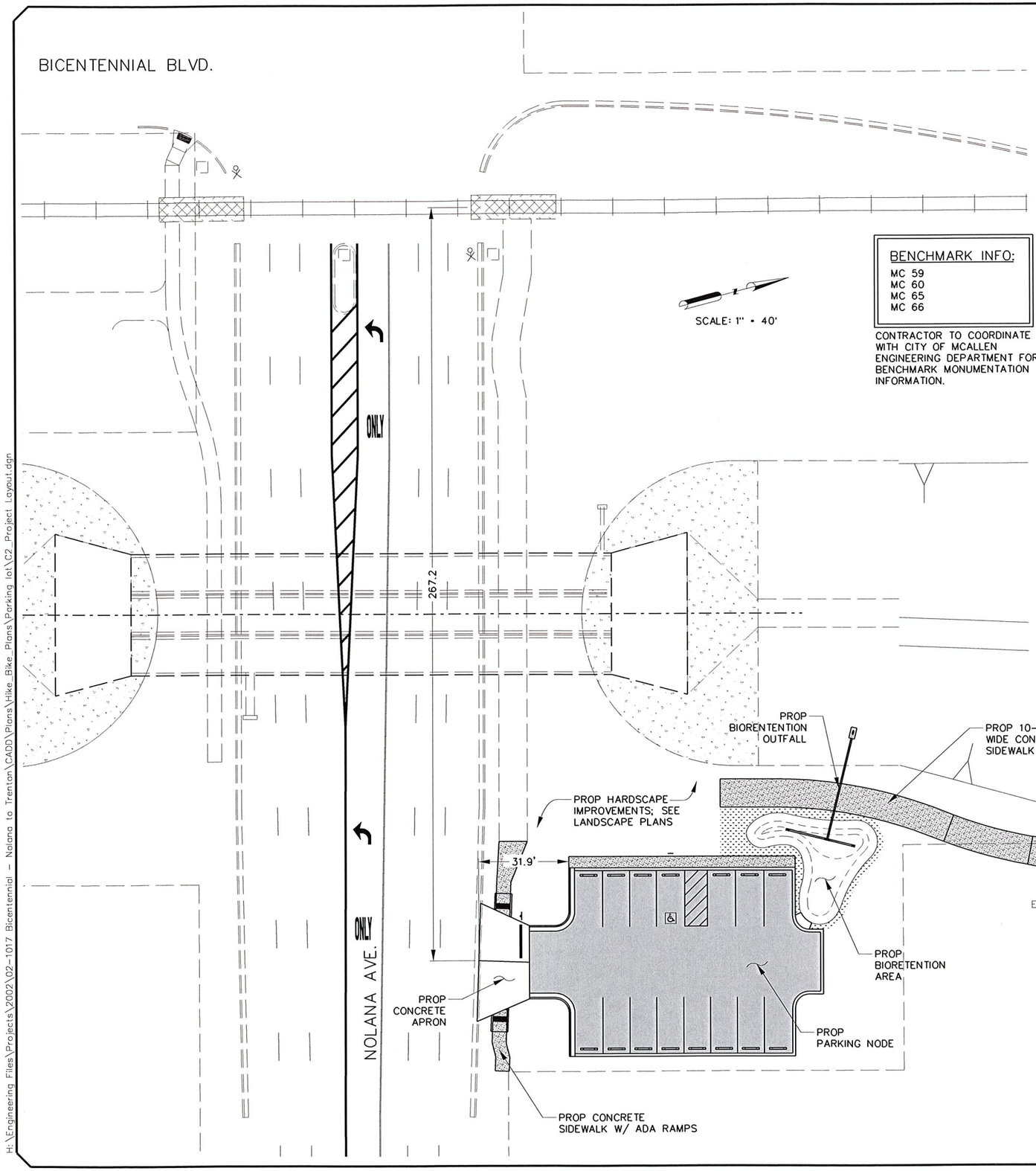
FILE NAME: FILE NAME
DATE: 10/21/2015
SURVEYED BY: ROD'S INC
DESIGNED BY: BG
DRAWN BY: MB
CHECKED BY: MC
PROJECT NO: 02-1017

BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT

PARKING NODE
GENERAL NOTES

CITY OF McALLEN
ENGINEERING DEPARTMENT

SCALE: N/A
REVISIONS:
1.
2.
3.
4.
SEAL:
DATE:
SHEET NO.: C1



SCALE: 1" = 40'

BENCHMARK INFO:

MC 59
MC 60
MC 65
MC 66

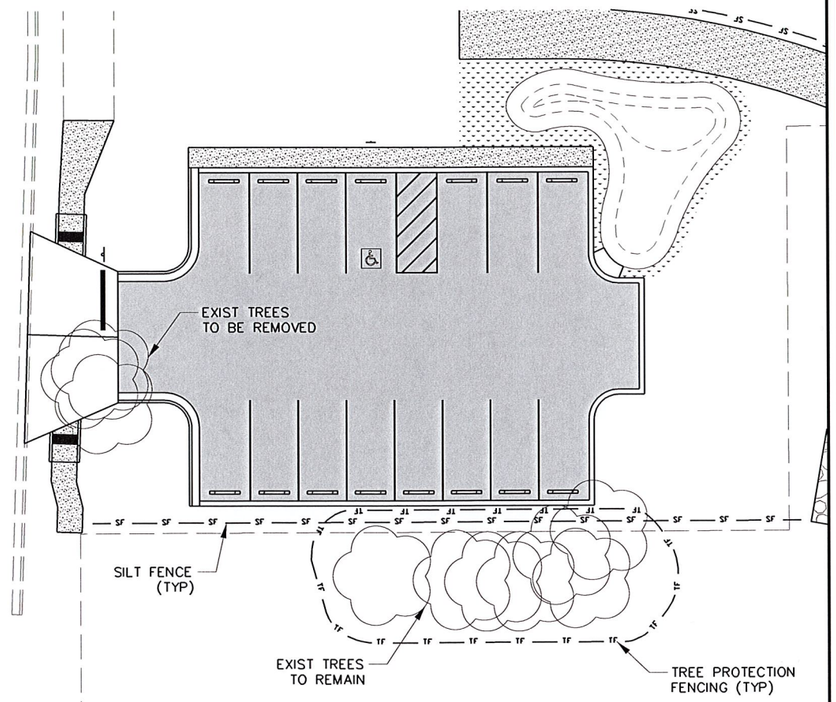
CONTRACTOR TO COORDINATE WITH CITY OF MCALLEN ENGINEERING DEPARTMENT FOR BENCHMARK MONUMENTATION INFORMATION.

SHEET QUANTITIES*

ITEM DESCRIPTION	UNIT	QTY
SILT FNC	LF	375
TREE PROTECTION FENCING	LF	180
STAB CONST EXIT	EA	1

*FOR CONTRACTOR'S INFORMATION ONLY

SCALE: 1" = 30'



TEMPORARY EROSION AND SEDIMENT COTROL

NOTE: REFER TO GENERAL NOTES FOR ADDITIONAL DETAIL

SUMMARY OF ESTIMATED PROJECT QUANTITIES

ITEM DESCRIPTION	UNIT	QTY
SILT FNC*	LF	375
TREE PROTECTION FENCING*	LF	180
STAB CONST EXIT*	EA	1
CLEAR & GRUB	LS	1
EXCAV & GRAD (PARKING AREA)	CY	220
2-IN HMAC (TY D); LIMESTONE AGGR	SY	623
8-IN FLEX BASE (TY F, GR 4)	SY	777
6-IN SUBGRADE (LIME TRT, 2% BY WT)	SY	792
CONC HEADER CURB (12-IN)	LF	239
CONC CURB & GUT (24-IN)	LF	66
CONC APRON (DRWY, 6-IN, THK)	SY	102
CONC SW (4-IN THK)	SY	235
SIDEWALK RAMP (TY 7)	EA	2
EXCAV & GRAD (BIOSWALE)	CY	87
6-IN PVC*	LF	40
6-IN PVC (PERF)*	LF	24
6-IN PVC RSR STRC W/BEE HIVE INLET*	LF	1
4-IN PVC CLEAN-OUT*	EA	2
CONC SLP-END TREATMENT	EA	1
PM, 4-IN W (SLD)*	LF	346
PM, 24-IN W (SLD)*	LF	12
PM, STOP SIGN*	EA	1
PM, ACCESSIBLE SPACE SYMB (WC)*	EA	1
ACCESSIBLE SPACE SIGN*	EA	1
CONC WHEEL STOP	EA	15
ACCESS GATE (TRAIL)	EA	1
TRAFFIC CONTROL	LS	1

*FOR CONTRACTOR'S INFORMATION ONLY

STATE OF TEXAS
MARIO A. CRUZ
96398
LICENSED
PROFESSIONAL ENGINEER

P.E.
01/06/18

FILE NAME: FILE NAME
DATE: 10/21/2015
SURVEYED BY: ROD'S INC
DESIGNED BY: BG
DRAWN BY: MB
CHECKED BY: MC
PROJECT NO: 02-1017

BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT

PARKING NODE
PROJECT LAYOUT

CITY OF McALLEN
ENGINEERING DEPARTMENT

SCALE: AS SHOWN

REVISIONS:
1.
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3.
4.

SEAL:

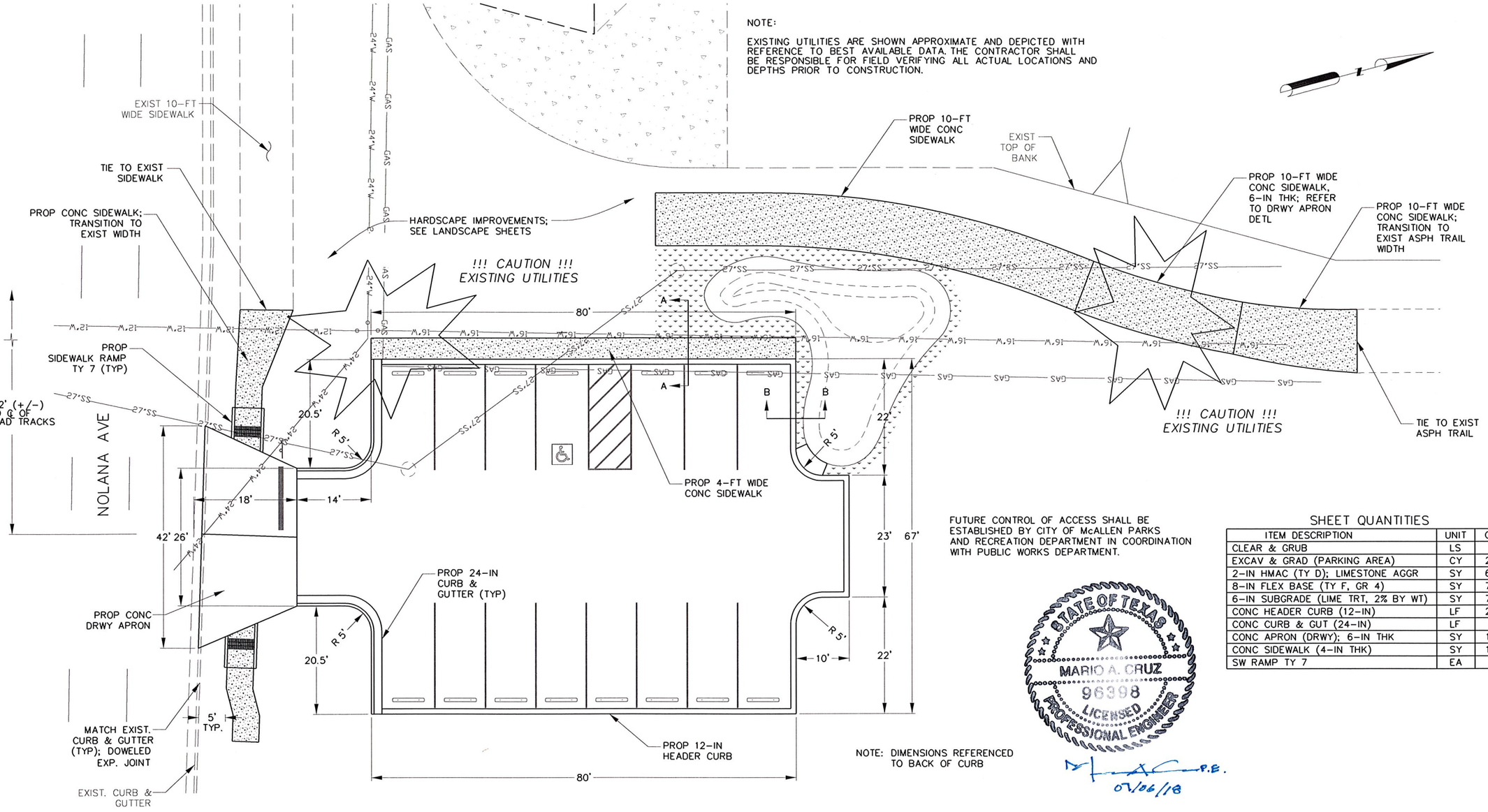
DATE:

SHEET NO.: C2

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NOTE:

EXISTING UTILITIES ARE SHOWN APPROXIMATE AND DEPICTED WITH REFERENCE TO BEST AVAILABLE DATA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL ACTUAL LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION.



FUTURE CONTROL OF ACCESS SHALL BE ESTABLISHED BY CITY OF McALLEN PARKS AND RECREATION DEPARTMENT IN COORDINATION WITH PUBLIC WORKS DEPARTMENT.

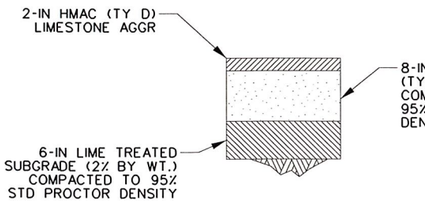
NOTE: DIMENSIONS REFERENCED TO BACK OF CURB

SHEET QUANTITIES

ITEM DESCRIPTION	UNIT	QTY
CLEAR & GRUB	LS	1
EXCAV & GRAD (PARKING AREA)	CY	220
2-IN HMAC (TY D); LIMESTONE AGGR	SY	623
8-IN FLEX BASE (TY F, GR 4)	SY	777
6-IN SUBGRADE (LIME TRT, 2% BY WT)	SY	792
CONC HEADER CURB (12-IN)	LF	239
CONC CURB & GUT (24-IN)	LF	66
CONC APRON (DRWY); 6-IN THK	SY	102
CONC SIDEWALK (4-IN THK)	SY	179
SW RAMP TY 7	EA	2

STATE OF TEXAS
MARIO A. CRUZ
96998
LICENSED
PROFESSIONAL ENGINEER

P.E.
07/06/18



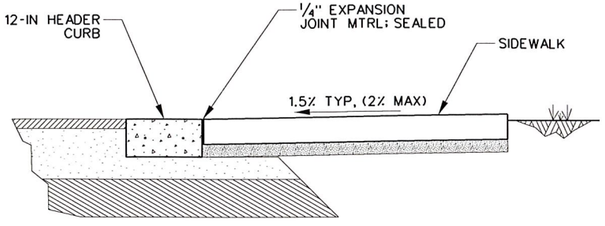
DETAIL: PAVEMENT SECTION
NTS

FLEXIBLE BASE:

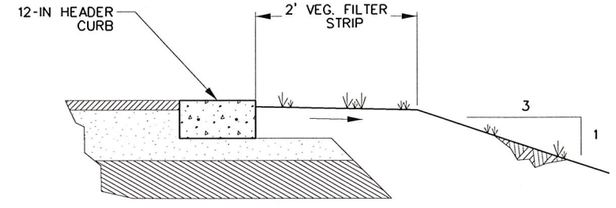
MAX P.I.-12
TRI-AXIAL: 150 MIN. AT 15 P.S.I.

GRADATION

SIEVE SIZE	% RETAINED
2"	0
1/2"	20-60
#4	40-75
#40	70-90



SECTION: A-A
NTS



SECTION: B-B
NTS

FILE NAME: FILE NAME
DATE: 10/21/2015
SURVEYED BY: ROD'S INC
DESIGNED BY: BG
DRAWN BY: MB
CHECKED BY: MC
PROJECT NO: 02-1017

BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT

PARKING NODE PAVING PLAN

CITY OF McALLEN ENGINEERING DEPARTMENT

SCALE: 1" = 20'

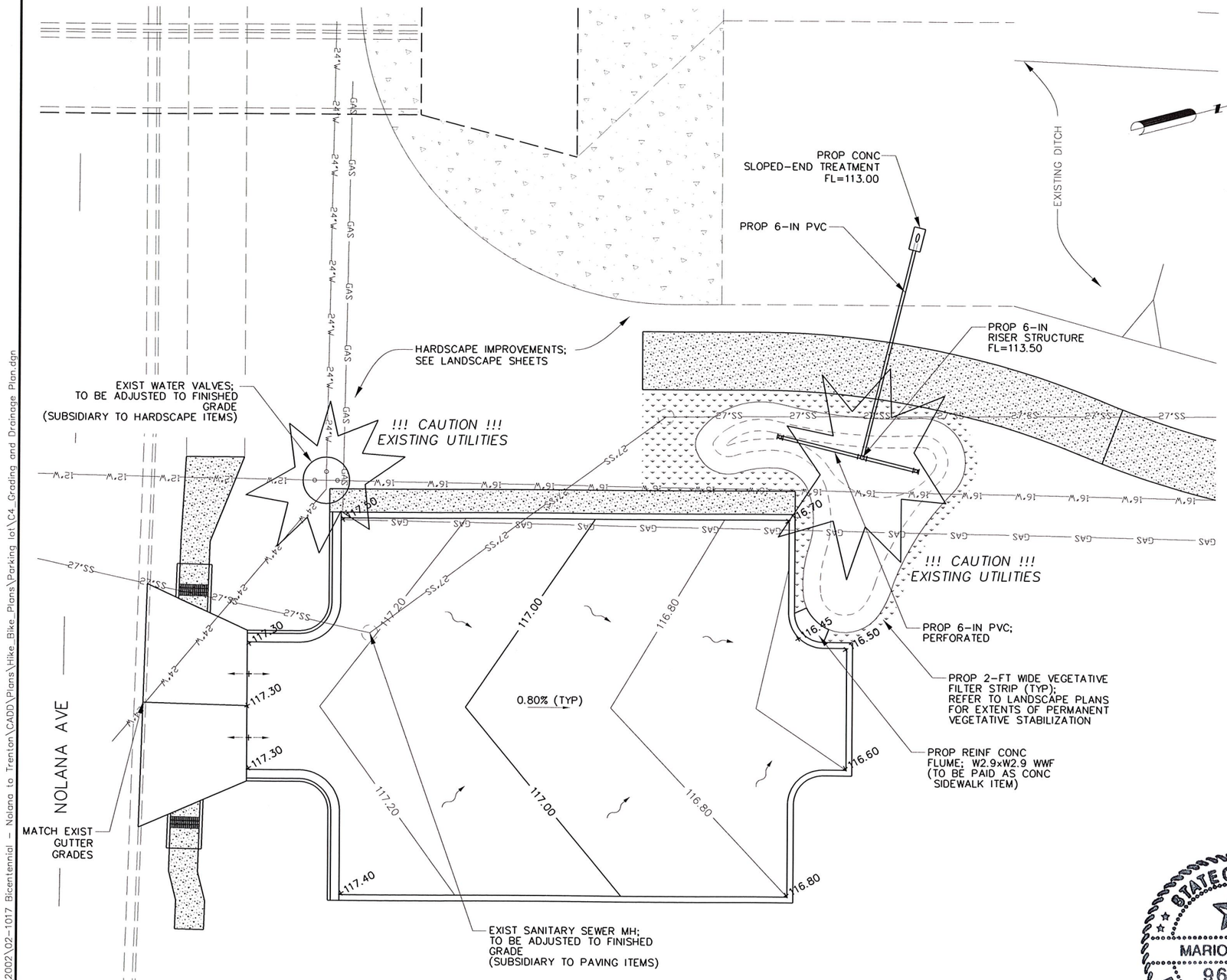
REVISIONS:
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SEAL:

DATE:

SHEET NO.: C3

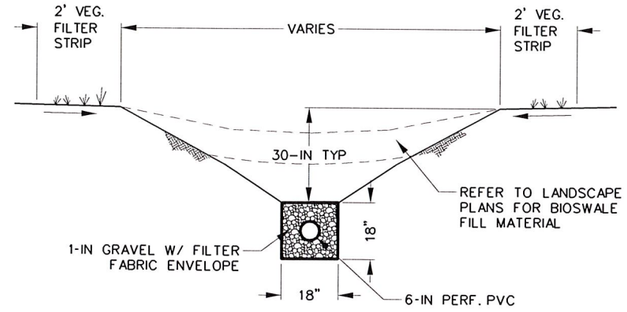
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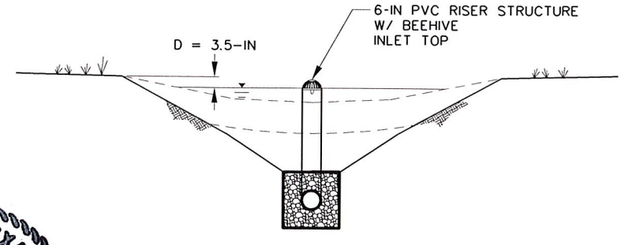
SHEET QUANTITIES

ITEM DESCRIPTION	UNIT	QTY
EXCAV & GRAD (BIOSWALE)	CY	87
6-IN PVC*	LF	40
6-IN PVC (PERF); INCL GRVL ENVELOPE*	LF	24
6-IN PVC RISER STRUC; BEEHIVE INLET*	EA	1
4-IN PVC CLEAN-OUT*	EA	2
REINF CONC FLUME	SY	2
CONC SLP-END TREATMENT*	EA	1

FOR CONTRACTOR'S INFORMATION ONLY



DETAIL: BIORETENTION UNDERDRAIN
NTS



DETAIL: RISER STRUCTURE
NTS

STATE OF TEXAS
MARIO A. CRUZ
96398
LICENSED PROFESSIONAL ENGINEER

M. A. Cruz P.E.
07/06/18

FILE NAME: FILE NAME
DATE: 10/21/2015
SURVEYED BY: ROD'S INC
DESIGNED BY: BG
DRAWN BY: MB
CHECKED BY: MC
PROJECT NO: 02-1017

BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT

PARKING NODE
GRADING AND DRAINAGE PLAN

CITY OF McALLEN
ENGINEERING DEPARTMENT

SCALE: 1" = 20'

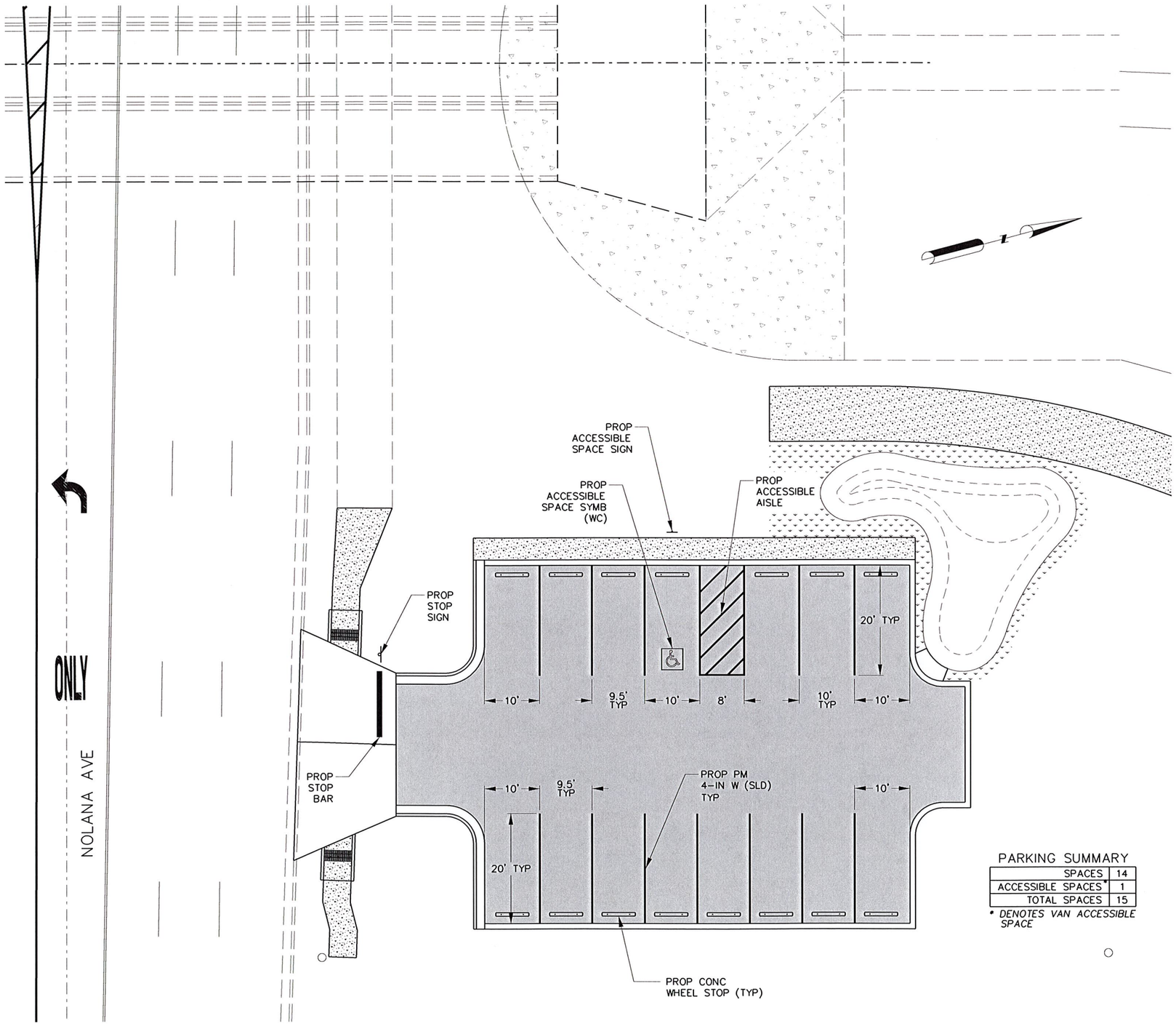
REVISIONS:
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SEAL:

DATE:

SHEET NO.: C4

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SHEET QUANTITIES

ITEM DESCRIPTION	UNIT	QTY
PM, 4-IN W (SLD)*	LF	346
PM, 24-IN W (SLD)*	LF	12
PM, ACCESSIBLE SPACE SYMB (WC)*	EA	1
STOP SIGN*	EA	1
ACCESSIBLE SPACE SIGN*	EA	1
CONC WHEEL STOP	EA	15

FOR CONTRACTOR'S INFORMATION ONLY

PARKING SUMMARY

SPACES	14
ACCESSIBLE SPACES*	1
TOTAL SPACES	15

* DENOTES VAN ACCESSIBLE SPACE

STATE OF TEXAS
MARIO A. CRUZ
96398
LICENSED
PROFESSIONAL ENGINEER

P.E.
07/06/18

FILE NAME: FILE NAME
DATE: 10/21/2015
SURVEYED BY: ROD'S INC
DESIGNED BY: BG
DRAWN BY: MB
CHECKED BY: MC
PROJECT NO: 02-1017

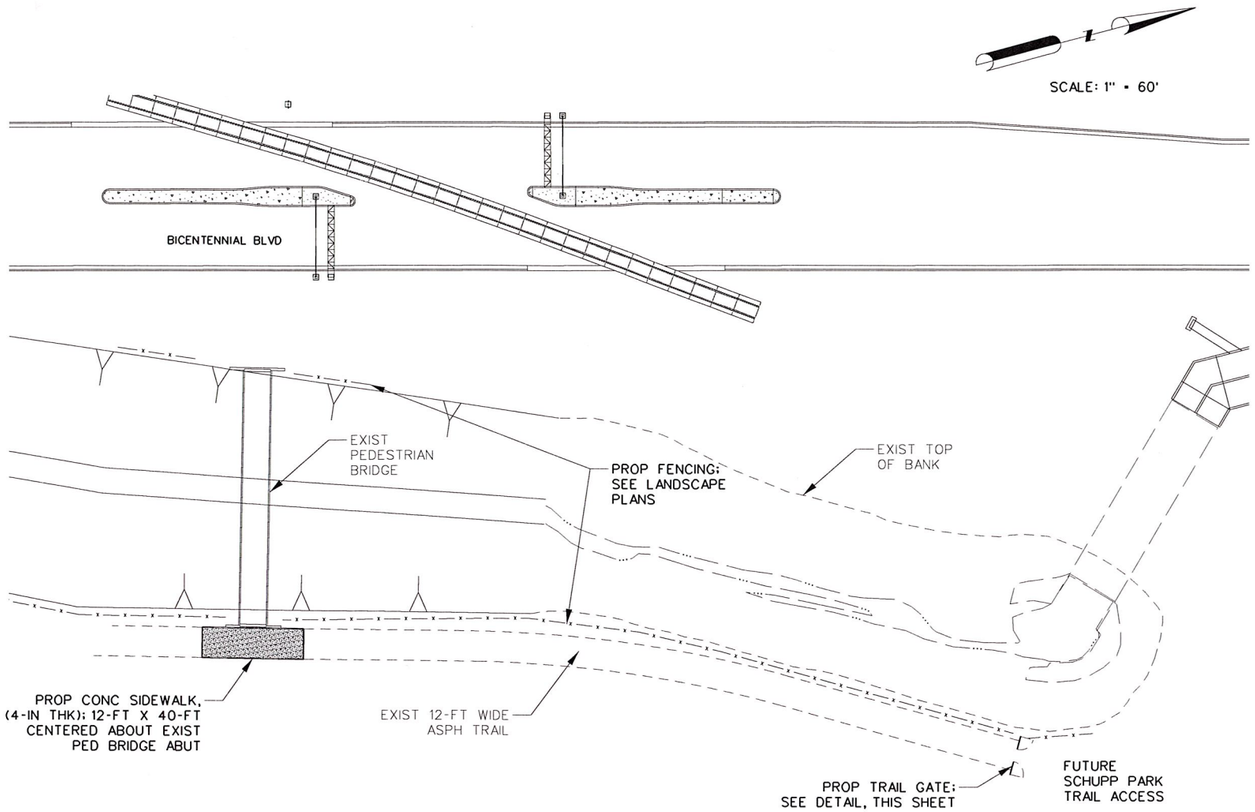
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT

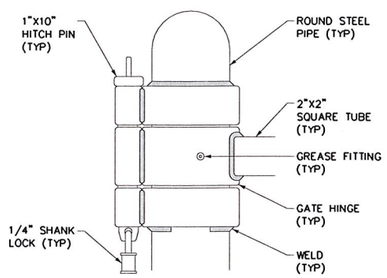
PARKING NODE
PAVEMENT MARKING PLAN

CITY OF McALLEN
ENGINEERING DEPARTMENT

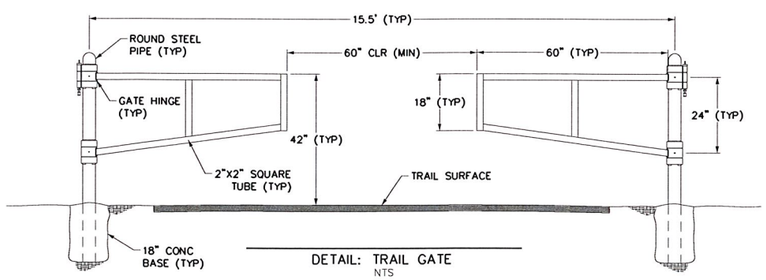
SCALE: 1" = 20'
REVISIONS:
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SEAL:
DATE:
SHEET NO.: C5

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DETAIL: GATE HINGE W/STOP
NTS



DETAIL: TRAIL GATE
NTS

GATE NOTES:

GATE POSTS SHALL BE 4-IN O.D. STEEL PIPE (SCH 40). SQUARE TUBING SHALL BE 2-IN x 2-IN x 1/4-IN THK.

ALL WELDS SHALL BE CONTINUOUS. ALL BARBS SHALL BE GROUND PRIOR TO PAINTING.

FINISH ALL METAL WITH ONE COAT PRIMER AND TWO COATS INDUSTRIAL GRADE ENAMEL. COLOR PER CITY OF MCALLEN PARKS & RECREATION DEPARTMENT.

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.

CONCRETE FOR POST BASE SHALL BE 3,000 PSI.

SHEET QUANTITIES

ITEM DESCRIPTION	UNIT	QTY
CONC SIDEWALK (4-IN THK); BRDG LANDING	SY	54
ACCESS GATE (TRAIL)	EA	1

REMOVAL OF EXISTING ASPHALT TRAIL SHALL BE SUBSIDIARY TO ITEM, "CONC SIDEWALK".

STATE OF TEXAS
MARIO A. CRUZ
96398
LICENSED
PROFESSIONAL ENGINEER

P.E.
07/06/18

FILE NAME: FILE NAME
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SURVEYED BY: ROD'S INC
DESIGNED BY: BG
DRAWN BY: MB
CHECKED BY: MC
PROJECT NO: 02-1017

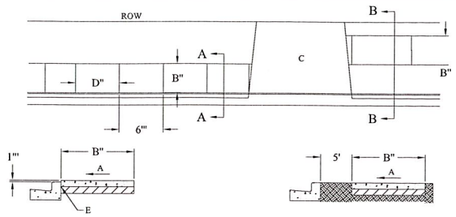
BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT

PARKING NODE MISCELLANEOUS IMPROVEMENTS - NORTH

CITY OF McALLEN
ENGINEERING DEPARTMENT

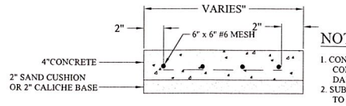
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REVISIONS:
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SEAL:
DATE:
SHEET NO: C5A

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SECTION A-A

SECTION B-B



NOTE

1. CONCRETE SHALL HAVE 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
2. SUBGRADE SHALL BE COMPACTED TO 90% MAX DENSITY.

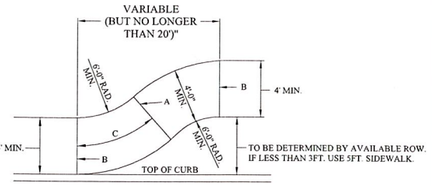
GENERAL NOTES:

1. DEVIATIONS FROM THESE STANDARDS SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
2. SIDEWALK SHALL BE CONSTRUCTED WITHIN STREET R.O.W.
3. PROVIDE 5' X 5' PASSING SPACE AT A MAXIMUM 200' INTERVALS, IF SIDEWALK IS LESS THAN 5' ON WIDTH (DRIVEWAY IS CONSIDERED A PASSING SPACE)

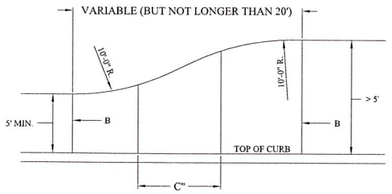
CONSTRUCTION NOTES:

A. CROSS-SLOPE AT 1.5% USUAL AND 2.0% MAX.
B. SIDEWALK, WIDTH VARIES. 4 FT MINIMUM WHEN SETBACK 5 FT FROM THE CURB. 5 FT. MINIMUM WHEN ADJACENT TO THE CURB.
C. SEE DRIVEWAY APRON DETAIL.
D. CONTRACTION JOINTS EVERY 6 FT.; EXPANSION JOINT EVERY 30 FT. AND ALONG CURB AND GUTTER WHEN SIDEWALK ADJACENT TO CURB AND ALONG ANY STRUCTURE EXISTING.
E. 1/2" EXPANSION JOINT.

	TYPICAL SIDEWALK DETAILS SHEET 1 OF 3	DETAIL 220.1 02/2009



CURB TYPE TO OFFSET TYPE



CURB TYPE WITH VARYING WIDTHS

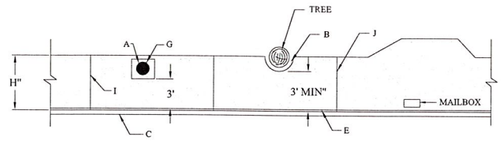
CONSTRUCTION NOTES:

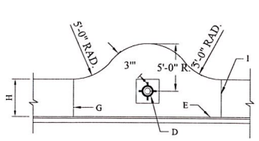
A. WEAKENED PLAN JOINT ALIGNMENT TO BE RADIAL.
B. 1/2" EXPANSION JOINT.
C. CONSTRUCTION JOINTS SHALL NOT BE GREATER THAN 6 FEET ON CENTER BETWEEN EXPANSION JOINTS, MEASURED ALONG SIDEWALK.

	TYPICAL SIDEWALK DETAILS TRANSITION SHEET 2 OF 3	DETAIL 220.2 02/2009

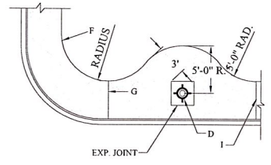
CONSTRUCTION NOTES:

A. POWER POLE OR OTHER OBSTRUCTION.
B. LEAVE 6" CLEARANCE AROUND TREE TRUNKS.
C. TOP OF CURB.
D. FIRE HYDRANT.
E. BACK OF CURB.
F. EXTERIOR EDGE OF SIDEWALK TO BE TANGENT TO ARCS.
G. PROVIDE 1/2" PREFORMED EXPANSION JOINT MATERIAL WHERE SIDEWALK ABUTS POWER POLES, FIRE HYDRANTS, MAILBOXES OR OTHER IMMOVABLE OBJECTS.
H. SIDEWALK WIDTH.
I. CONTRACTION JOINT.
J. EXPANSION JOINT.



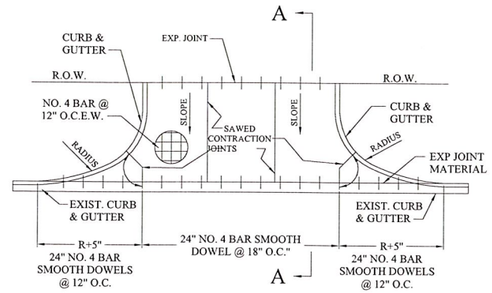


ON STRAIGHT STRETCH



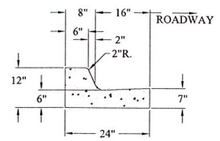
AT CURB RETURN

	TYPICAL SIDEWALK DETAILS OBSTRUCTIONS SHEET 3 OF 3	DETAIL 220.3 02/2009

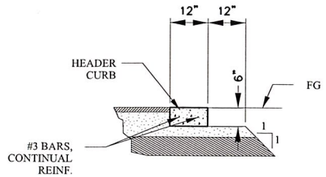


NOTE:
INDUSTRIAL DRIVEWAY TO BE APPROVED BY CITY ENGINEER.

	CONCRETE APRON TYPICAL JOINT LAYOUT	DETAIL 214 02/2009

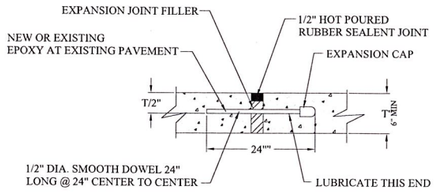


STANDARD CURB & GUTTER TYPE A

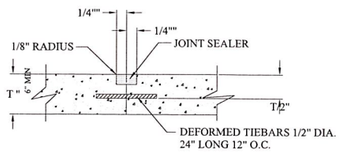


DETAIL: 12-IN HEADER CURB

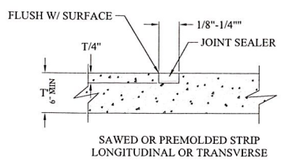
	CONCRETE CURB & GUTTER	



EXPANSION JOINT



CONSTRUCTION JOINT



SAWED CONTRACTION JOINT

	TYPICAL CONCRETE JOINT DETAILS	DETAIL 206 02/2009

GENERAL NOTES:

1. CURBS AND GUTTERS TO BE CONSTRUCTED OF 3000 PSI CONCRETE.
2. FOR NON-REINFORCED STANDARD CURB OR CURB & GUTTER PROVIDE SAWED CONTRACTION JOINTS 10' O.C. MAX. ALSO PROVIDE 1/2" EXPANSION JOINTS AT 30' O.C. MAX. AT POINTS OF CURVATURE, CURB INLETS, BOX CULVERTS, AT EACH SIDE OF DRIVEWAYS AND ADJACENT TO SIDEWALK.
3. FOR REINFORCED STANDARD CURB OR CURB & GUTTER PROVIDE SAWED CONTRACTION JOINTS 10' O.C. MAX AND EXPANSION JOINTS SHALL BE SPACED AT 120' O.C. MAX, AT POINTS OF CURVATURE, CURB INLETS, BOX CULVERTS, AT EACH SIDE OF DRIVEWAYS, AND ADJACENT TO SIDEWALKS.
4. EDGES NOT SPECIFIED WITH DIMENSIONS SHALL BE EDGED WITH A 3/8" EDGING TOOL.
5. A MEMBRANE CURING COMPOUND SHALL BE APPLIED TO EXPOSED CURB OR CURB & GUTTER AFTER THE SURFACE FINISH HAS BEEN COMPLETED AT A MIN. RATE OF 1 GAL/180 S.F. OF SURFACE AREA.
6. DESIGN ELEVATIONS TO BE GIVEN AT PC, PT AND MID POINT OF THE CURB RADII (FLOW OF CURB ELEVATION) AND AT INTERSECTIONS OF PROJECTED FLOWLINES (FLOWLINE ELEVATION).
7. ON UPSTREAM AND DOWNSTREAM ENDS OF THE INTERSECTION, VALLEY GUTTER CONSTRUCTION SHALL EXTEND TO THE END OF RETURNS.
8. THE VALLEY GUTTER TO BE REINFORCED WITH 6"X 6" X NO. 6 GA. WIRE MESH. OR NO. 3 @ 12" O.C.E.W. 4. INVERT OF VALLEY GUTTER TO EXTEND FROM FLOWLINE OF UPSTREAM CURB RETURN TO FLOWLINE OF DOWNSTREAM CURB RETURN.
9. FOR NEW CONSTRUCTION, VALLEY GUTTER SHALL BE CONSTRUCTED PRIOR TO ADJACENT PAVEMENT.
10. PRIOR TO CONSTRUCTION OF NEW VALLEY GUTTER ON EXISTING ACCEPTED STREETS, PAVEMENT SHALL BE REMOVED AS SHOWN ON PLANS.
11. FOR HANDICAP RAMP, SEE DETAIL.
12. EXISTING CURB OR PAVEMENT SHALL BE SAWCUT WHERE NECESSARY TO CONNECT TO PROPOSED VALLEY GUTTER.

	CONCRETE CURB & GUTTER	DETAIL 207.3 02/2009

STATE OF TEXAS
MARIO A. CRUZ
96398
LICENSED
PROFESSIONAL ENGINEER

P.E.
09/06/18

FILE NAME: FILE NAME
DATE: 10/21/2015
SURVEYED BY: ROD'S INC
DESIGNED BY: BG
DRAWN BY: MB
CHECKED BY: MC
PROJECT NO: 02-1017

BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT

PARKING NODE
DETAILS

CITY OF McALLEN
ENGINEERING DEPARTMENT

SCALE: NTS

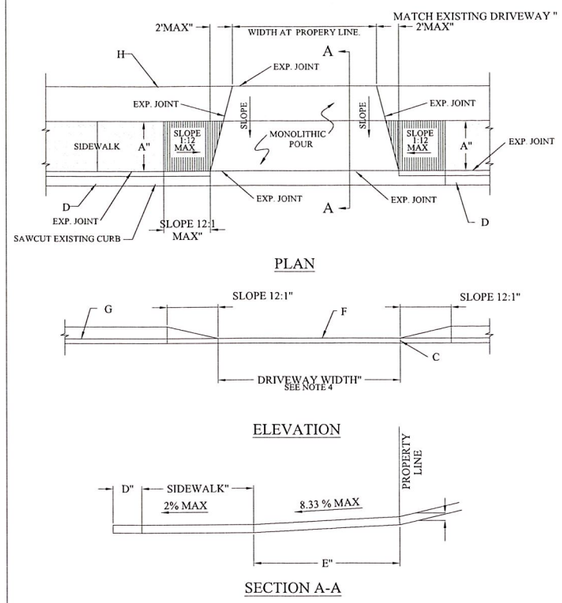
REVISIONS:
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DATE:

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C6

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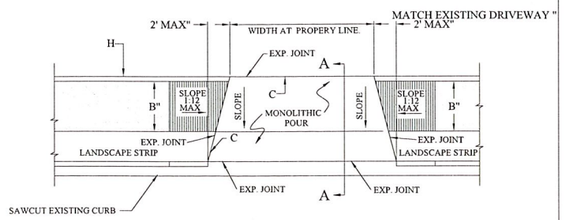


PLAN

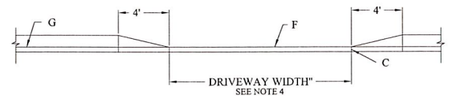
ELEVATION

SECTION A-A

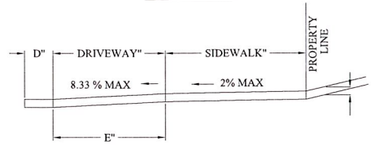
	CONCRETE DRIVEWAY APRON (SIDEWALK ADJACENT TO CURB) SHEET 1 OF 3	DETAIL 215.1 02/2009



PLAN



ELEVATION



SECTION A-A

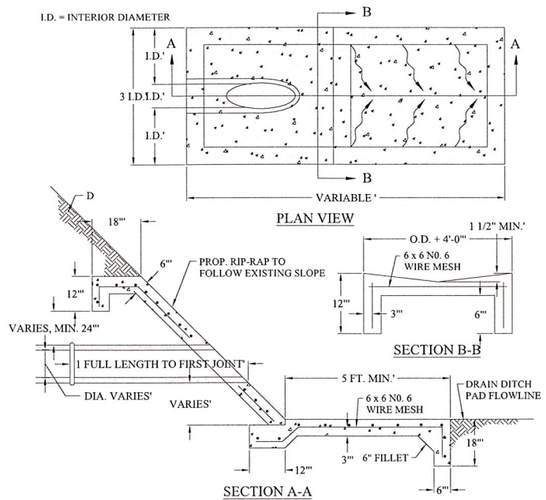
	CONCRETE DRIVEWAY APRON (SIDEWALK OFFSET FROM CURB) SHEET 2 OF 3	DETAIL 215.2 02/2009

GENERAL NOTES

1. DEVIATIONS FROM THESE STANDARDS SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
2. USE 1/2" EXPANSION JOINT WHERE SIDEWALK OR DRIVEWAY APRON ABUTS BUILDING, FENCES,WALLS OR OTHER IMMOVABLE OBJECTS.
3. DRIVEWAY APRON WIDER THAN 18 FT (NOMINAL) SHALL HAVE A SAWED CONSTRUCTION JOINT AT MIDPOINT. DRIVEWAY APRON WIDER THAN 36 FT. SHALL HAVE AN EXPANSION JOINT EQUALLY SPACED AT MID-POINT OF DRIVEWAY.
4. MAXIMUM DRIVEWAY APRON WIDTHS SHALL BE:
   RESIDENTIAL: 24 FT MAX.
   COMMERCIAL: 45 FT MAX.
5. SUBGRADE UNDER DRIVEWAY APRON SHALL BE COMPACTED TO 95% MIN. DENSITY TO A DEPTH OF 6".
6. DRIVEWAY APRON SHALL HAVE A MINIMUM THICKNESS OF 6" AND BE PLACED USING 3000 P.S.I. CONCRETE WITH 6"X6" WELDED WIRE MESH, NO. 3 BARS @ 12" O.C.E.W. OR NO. 4 @ 18" O.C.E.W.
7. CURB CUT MUST BE A MINIMUM OF 6 FT FROM SIDE YARD PROPERTY LINE.
8. CURB CUT MUST BE A MINIMUM OF 25 FT FROM THE PROJECTION OF THE CLOSEST THROUGHLANE AT A STREET INTERSECTION.
9. CONCRETE SHALL HAVE A BROOM FINISH. BRICK PAVERS, EXPOSED AGGREGATE, RIVER-BRICK FINISH, TILE ARE NOT PERMITTED WITHIN THE R.O.W.
10. MEMBRANE CURING COMPOUND SHALL BE APPLIED AT A MINIMUM OF 1 GALLON PER 180 SQUARE FEET OF AREA AFTER SURFACE FINISH HAS BEEN COMPLETED.

CONSTRUCTION NOTES

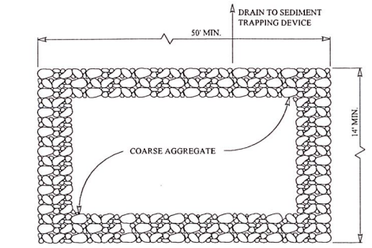
	CONCRETE DRIVEWAY APRON (SIDEWALKOFFSET FROM CURB) SHEET 3 OF 3	DETAIL 215.3 02/2009



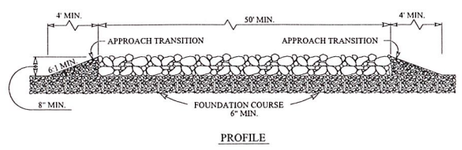
GENERAL NOTES:

1. CONCRETE TO HAVE 3000 P.S.I. MIN. AT 28 DAY COMPRESSIVE STRENGTH.
2. ALL STEEL TO BE GRADE 60.
3. MIN. 90% COMPACTION STD. PROCTOR DENSITY
4. STANDARD DETAIL FOR CITY OF MCALLEN DITCHES

	CONCRETE SLOPED-END TREATMENT	DETAIL 110 02/2009



PLAN

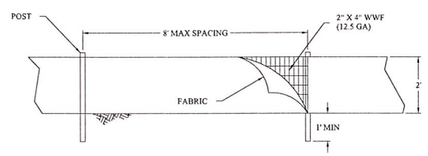


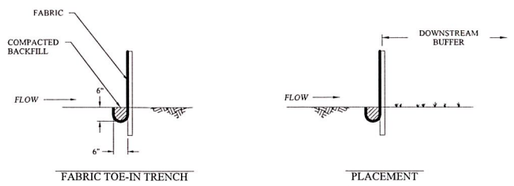
PROFILE

NOTES:

1. THE LENGTH OF THE TYPE 1 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 4" TO 8".
3. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6:1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
4. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
5. THE CONSTRUCTION EXIT SHALL BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

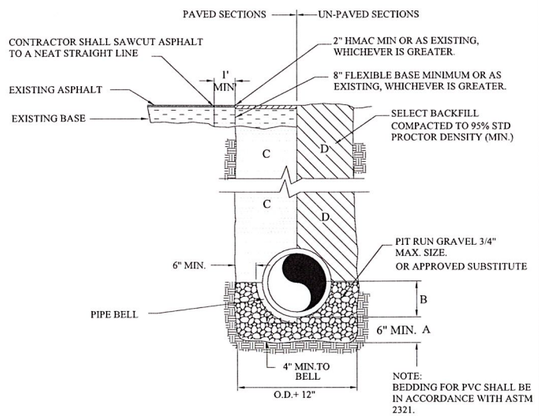
	CONSTRUCTION INGRESS/EGRESS SEDIMENT CONTROL TYPE 1	DETAIL 301 02/2009





1. SILT FENCE SHALL BE PLACED WITH FABRIC FACING ONCOMING FLOW
2. POSTS MAY BE WOOD OR STEEL WITH A MINIMUM EMBEDMENT OF 12-INCHES
3. TOE-IN TRENCH MAY BE INSTALLED WITH EITHER SPADE OR MECHANINCAL TRENCHER. TRENCH MUST BE MINIMUM OF 6-INCHES TO ACCOMODATE SILT FENCE FABRIC TO BE BACKFILLED AND COMPACTED
4. FABRIC MUST BE SECURELY FASTNED TO WOVEN WIRE
5. SILT FENCE SHALL BE INSPECTED IN ACCORDANCE WITH SW3P REQUIREMENTS
6. ACCUMULATED SILT SHALL BE REMOVED AT A MAXIMUM DEPTH OF 6-INCHES AND PROPERLY DISPOSED IN ACCORDANCE WITH SW3P
7. WHERE FIELD CONDITIONS PERMIT, SILT FENCE PLACEMENT SHALL INCORPORTE DOWNSTREAM VEGETATIVE BUFFER
8. SILT FENCE SHALL NOT IMPEDE ACCESS TO PEDESTRIAN FACILITIES

	SILT FENCE	DETAIL 207.3R 02/2013



A. GRAVEL BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE (MIN. THICKNESS=6") PIT RUN GRAVEL 3/4" MAX SIZE.
B. GRAVEL PLACED AFTER PIPE IS LAID, FROM BOTTOM OF PIPE TO THE SPRING LINE. PIT RUN GRAVEL 3/4" MAX. SIZE OR APPROVED SUBSTITUTE.
C. CITY STREETS PARKING AREA, DRIVEWAYS: SELECT EXCAVATED BACK FILL COMPACTED 95% STD, 8" LIFTS, MECHANICAL COMPACTION.
D. STATE MAINTAINED ROADWAYS: COMPACTED SAND/CEMENT STABILIZED BACK FILL 7% PORTLAND CEMENT COMPACTED AS PER ASTM D-4253 AND ASTM D-698.
E. SELECT EARTH BACKFILL COMPACTED TO 95% STD. PROCTOR DENSITY (12" LIFTS, MECHANICAL COMPACTION) FOUNDATION PREPARATION (WELLPOINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE. BACKFILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO 95% STD. PROCTOR DENSITY (USE RELATIVE DENSITY TEST PER ASTM D-4253 & ASTM D-698). THE THICKNESS OF EACH LOOSE LAYER SHALL NOT EXCEED 8". STRUCTURE BACK FILL MATERIAL SHALL BE SAND, EXCAVATED MATERIAL, OR OTHER APPROVED SUBSTITUTE.

	TYPICAL STORM SEWER PIPE BEDDING DETAIL	DETAIL 101 02/2009



P.E.
09/06/18

FILE NAME: FILE NAME
DATE: 10/21/2015
SURVEYED BY: ROD'S INC
DESIGNED BY: BG
DRAWN BY: MB
CHECKED BY: MC
PROJECT NO: 02-1017

BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT

PARKING NODE DETAILS

CITY OF McALLEN ENGINEERING DEPARTMENT

SCALE: NTS

REVISIONS:
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DATE:

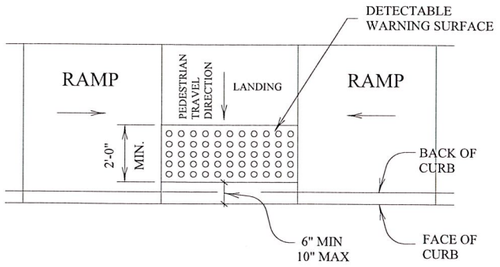
SHEET NO.: C7

H:\Engineering Files\Projects\2002\02-1017 Bicentennial - Nolana to Trenton\CADD\Plans\Hike_Bike_Plans\Parking lot\C6_C7_Detail Sheet.dgn

1. CURB RAMPS MUST CONTAIN A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES COMPLYING WITH SECTION 4.29 OF THE TEXAS ACCESSIBILITY STANDARDS (TAS). THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACES, INCLUDING SIDE FLARES. FURNISH DARK BROWN OR DARK RED DETECTABLE WARNING SURFACE ADJACENT TO UNCOLORED CONCRETE, UNLESS SPECIFIED ELSEWHERE IN THE PLANS.
2. DETECTABLE WARNING SURFACES MUST BE SLIP RESISTANT AND NOT ALLOW WATER TO ACCUMULATE.
3. ALIGN TRUNCATED DOMES IN THE DIRECTION OF PEDESTRIAN TRAVEL WHEN ENTERING THE STREET.
4. SHADED AREAS ON DETAILS INDICATE THE APPROXIMATE LOCATION FOR THE DETECTABLE WARNING SURFACE FOR EACH CURB RAMP TYPE.
5. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
6. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS A MINIMUM OF 6" AND A MAXIMUM OF 10" FROM THE EXTENSION OF THE FACE OF CURB. DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.
7. TXDOT MAINTAINS A LIST OF QUALIFIED DETECTABLE WARNING MATERIALS. DETAILS ARE PROVIDED HEREIN FOR THE PLACEMENT OF LANDSCAPE PAVERS. FOR OTHER MATERIALS, REFER TO THE MANUFACTURER'S PRODUCT MANUAL FOR PROPER INSTALLATION.

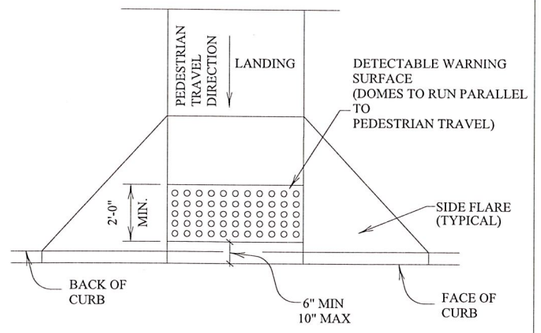
DETECTABLE WARNING DETAILS, GENERAL NOTES — DETAIL 221.9 02/2009

DETECTABLE WARNINGS



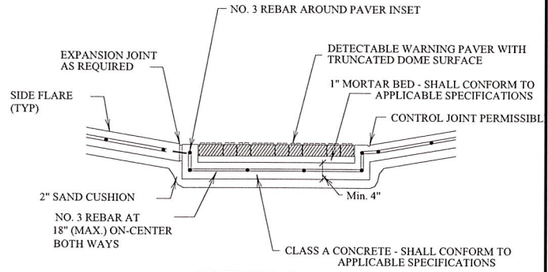
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.

DETECTABLE WARNING PLACEMENT, STREET EDGE — DETAIL 221.10 02/2009



TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

DETECTABLE WARNING DETAILS — DETAIL 222.1 02/2009

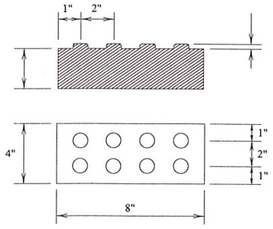


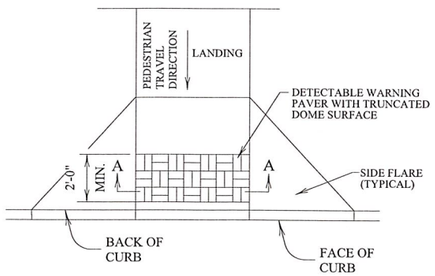
SECTION A-A

FURNISH DETECTABLE WARNING PAVER UNITS MEETING ALL REQUIREMENTS OF ASTM C-936, C-33. LAY IN A TWO BY TWO UNIT BASKET WEAVE PATTERN OR AS DIRECTED.

LAY FULL-SIZE UNITS FIRST FOLLOWED BY CLOSURE UNITS CONSISTING OF AT LEAST 25 PERCENT OF A FULL UNIT. CUT DETECTABLE WARNING PAVER UNITS USING A POWER SAW.

DETECTABLE WARNING PAVER OPTIONS — DETAIL 222.2 02/2009





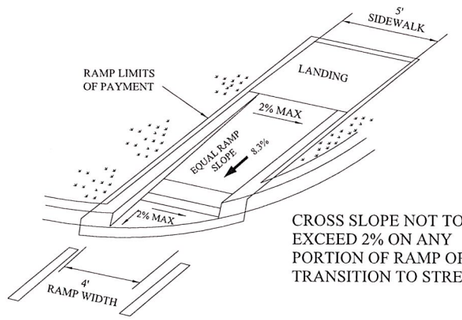
TRUNCATED DOME PATTERN CURB RAMP

DETECTABLE WARNING PAVER OPTION — DETAIL 222.3 02/2009

GENERAL NOTES

1. ALL SLOPES ARE MAXIMUM ALLOWABLE. THE LEAST POSSIBLE SLOPE THAT WILL STILL DRAIN PROPERLY SHOULD BE USED. ADJUST CURB RAMP LENGTH OR GRADE OF APPROACH SIDEWALKS AS DIRECTED.
2. THE MINIMUM SIDEWALK WIDTH IS 5'. WHERE THE SIDEWALK IS ADJACENT TO THE BACK OF CURB, A 6' SIDEWALK WIDTH IS ENCOURAGED. WHERE A 5' SIDEWALK CAN NOT BE PROVIDED DUE TO SITE CONSTRAINTS, A MINIMUM 3' SIDEWALK WITH 5'X 5' PASSING AREAS AT INTERVALS NOT TO EXCEED 200' IS REQUIRED.
3. LANDINGS SHALL BE 5'X 5' MINIMUM WITH A MAXIMUM 2% SLOPE IN ANY DIRECTION.
4. MANEUVERING SPACE AT THE BOTTOM OF CURB RAMPS SHALL BE A MINIMUM OF 4'X 4' WHOLLY CONTAINED WITHIN THE CROSSWALK AND WHOLLY OUTSIDE THE PARALLEL VEHICULAR TRAVEL PATH.
5. MAXIMUM ALLOWABLE CROSS SLOPE ON SIDEWALK AND CURB RAMP SURFACES IS 2%.
6. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP, EITHER BECAUSE THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR BECAUSE THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED. THERWISE, PROVIDE FLARED SIDES.
7. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, LIGHT REFLECTIVE VALUE AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) AND 16 TAC 68.102.
8. TO SERVE AS A PEDESTRIAN REFUGE AREA, THE MEDIAN SHOULD BE A MINIMUM OF 5' WIDE. MEDIANS SHOULD BE DESIGNED TO PROVIDE ACCESSIBLE PASSAGE OVER OR THROUGH THEM.
9. SMALL CHANNELIZATION ISLANDS, WHICH DO NOT PROVIDE A MINIMUM 5'X 5' LANDING AT THE TOP OF CURB RAMPS, SHALL BE CUT THROUGH LEVEL WITH THE SURFACE OF THE STREET.
10. CROSSWALK DIMENSIONS, CROSSWALK MARKINGS AND STOP BAR LOCATIONS SHALL BE AS SHOWN IN THE PLANS. AT INTERSECTIONS WHERE CROSSWALK MARKINGS ARE NOT REQUIRED, CURB RAMPS SHALL BE ALIGNED WITH THEORETICAL CROSSWALKS, OR AS DIRECTED BY THE ENGINEER.
11. EXISTING FEATURES THAT COMPLY WITH TAS MAY REMAIN IN PLACE UNLESS OTHERWISE SHOWN ON THE PLANS.
12. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. PROVIDE CURB RAMPS WHEREVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB.
13. CURB RAMPS AND LANDINGS SHALL BE CONSTRUCTED AND PAID FOR IN ACCORDANCE WITH ITEM 531 "SIDEWALKS".
14. SEPARATE CURB RAMP AND LANDINGS FROM ADJACENT SIDEWALK AND ANY OTHER ELEMENTS WITH PREMOLD OR BOARD JOINT OF 3/4" UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
15. PROVIDE A SMOOTH TRANSITION WHERE THE CURB RAMPS CONNECT TO THE STREET.
16. CURBS SHOWN ON SHEET 1 WITHIN THE LIMITS OF PAYMENT ARE CONSIDERED PART OF THE CURB RAMP FOR PAYMENT, WHETHER IT IS CONCRETE CURB, GUTTER, OR COMBINED CURB AND GUTTER.
17. FLARE SLOPE SHALL NOT EXCEED 10% MEASURED ALONG CURB LINE.

DETECTABLE WARNING DETAILS, PEDESTRIAN FACILITIES GENERAL NOTES — DETAIL 222.4 12/2010



CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP OR TRANSITION TO STREET.

DENOTES PLANTING OR NON-WALKING SURFACE.

DIRECTIONAL RAMP WITHIN RADIUS
(SIDEWALK SET BACK FROM CURB)

HANDICAP RAMP, DETAIL TYPE 7 — DETAIL 221.7 02/2009

STATE OF TEXAS
MARIO A. CRUZ
96398
LICENSED
PROFESSIONAL ENGINEER
P.E.
07/06/18

FILE NAME: FILE NAME
DATE: 10/21/2015
SURVEYED BY: ROD'S INC
DESIGNED BY: BG
DRAWN BY: MB
CHECKED BY: MC
PROJECT NO: 02-1017

BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT

PARKING NODE DETAILS

CITY OF McALLEN
ENGINEERING DEPARTMENT

SCALE: NTS

REVISIONS:
1.
2.
3.
4.

SEAL:

DATE:

SHEET NO.: C8

H:\Engineering Files\Projects\2002\02-1017 Bicentennial - Nolana to Trenton\CADD\Plans\Hike_Bike_Plans\Parking lot\C6_C7_Detail Sheet.dgn

GRAPHIC SCALE
0 50' 100'
1 INCH = 100' FT

SHEET L2

BICENTENNIAL BLVD.

RR TRACKS

BICENTENNIAL BLVD.

NOLANA ST.

SHEET L3

MATCH LINE 20+00

SHEET L3

BICENTENNIAL BLVD.

SHEET L4

MATCH LINE 20+00

MATCH LINE 32+00

BICENTENNIAL BLVD.

SHEET L5

MATCH LINE 32+00

RR TRACKS

CSJ NO:	
DATE:	01/06/16
SURVEYED BY:	00
DESIGNED BY:	00
DRAWN BY:	00
CHECKED BY:	00
PROJECT NO:	00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

LANDSCAPE IMPROVEMENTS
OVERALL LAYOUT

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

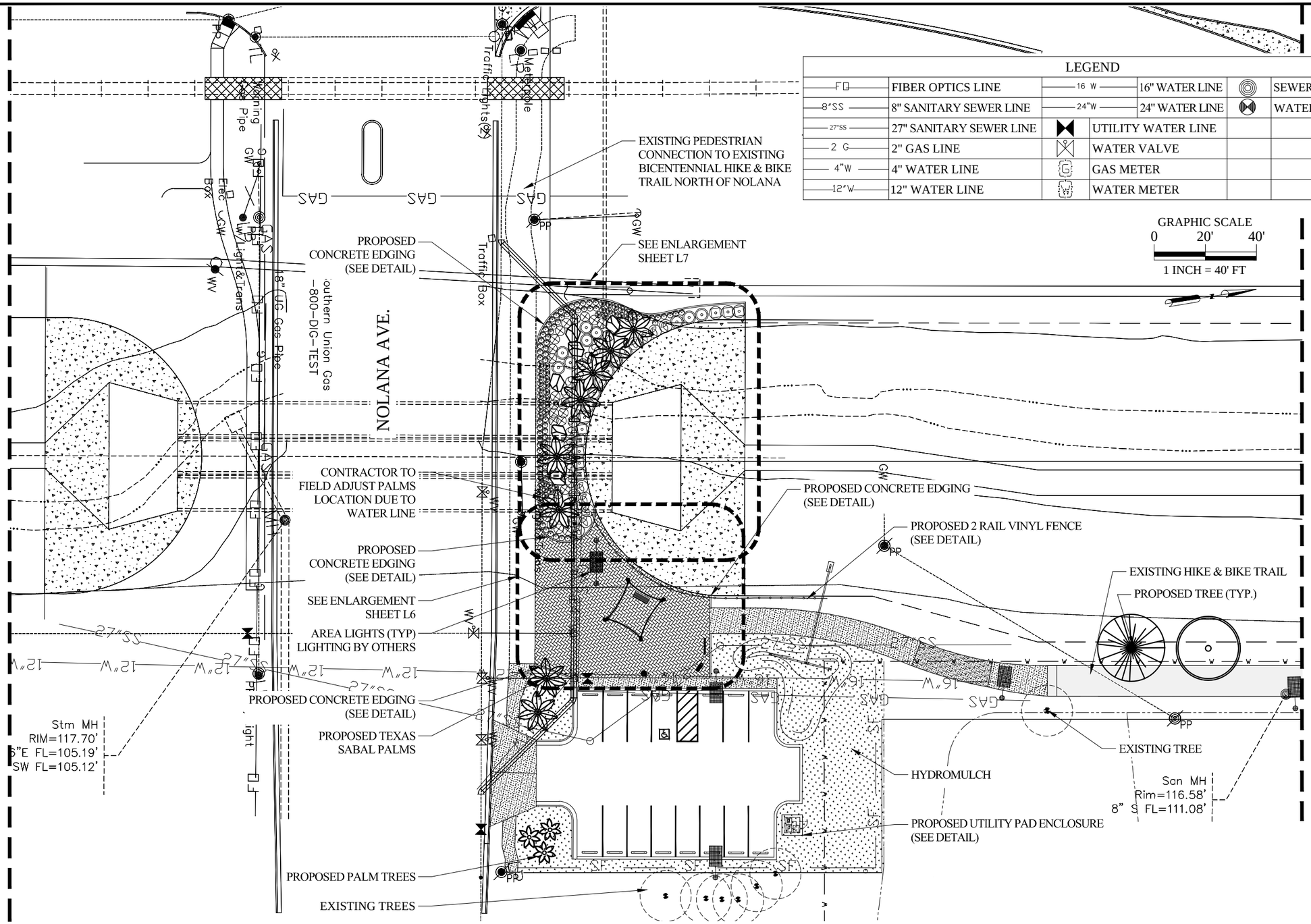
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REVISIONS:
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SEAL:

SHEET NO.:
L1

LAYOUT NAME: L1
DATE: APR 16, 2018 - 11:37 AM
LAST SAVED: APR 16, 2018 - 10:35 AM
SAVED TO: K:\MCALLEN\2017 BICENTENNIAL NOLANA TO RR TRACKS\CAD FILES\LANDSCAPE\L1.DWG



SYMBOL	SCIENTIFIC NAME	COMMON NAME	QTY	SIZE & COMMENTS
	PITHECELLOBIUM FLEXICAULE	EBONY TREE	1	3" CAL. B&B, STRONG CENTRAL LEADER
	ULMUS CRASSIFOLIA	CEDAR ELM	1	3" CAL. B&B, STRONG CENTRAL LEADER
	SABAL PALMETTO	SABAL PALM	8	3" CAL. B&B, STRONG CENTRAL LEADER
	WASHINGTONIA ROBUSTA	MEXICAN PALM	3	3" CAL. B&B, STRONG CENTRAL LEADER

SYMBOL	DESCRIPTION	QTY
	VINYL FENCE	107 LF
	UTILITY PAD ENCLOSURE	1
	AREA LIGHTS	4
	AREA LIGHTS	1
	BENCH	1

BIOSWALE GRASS MIX	
COMMON NAME	SCIENTIFIC NAME
ALAMO SWITCHGRASS	PANICUM VIRGATUM 'ALAMO'
LAVACA CANADA WILDRYE	ELYMUS CANADENSIS VAR. CANADENSIS
BUSHY BLUESTEM	ANDROPOGON GLOMERATUS
PLAINS COREOPSIS	COREOPSIS TINCTORIA

SYMBOL	DESCRIPTION	QTY
	6" LANDSCAPE CONCRETE CURB	176 LF

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT NOLANA AVE TO RR TRACKS

LANDSCAPE IMPROVEMENTS SEG. NOLANA ST. TO STA. 12+00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

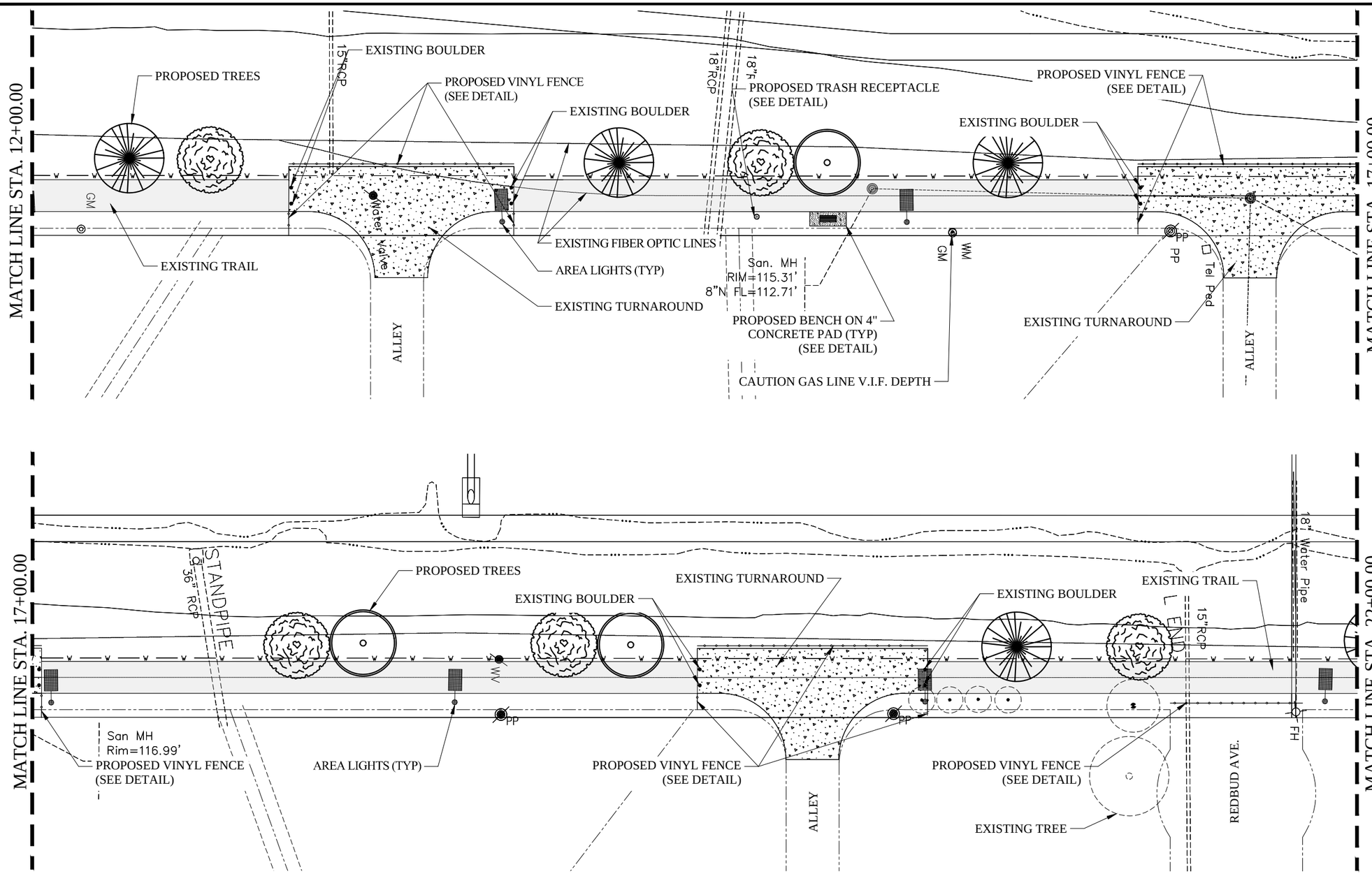
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REVISIONS:
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SEAL:

SHEET NO.: L2

LAYOUT NAME: L2
DATE: Aug 07, 2018 - 4:05pm
LAST SAVED: Aug 07, 2018 - 4:05pm
SAVED TO: K:\ENGINEERING\CITY BICENTENNIAL NOLANA to RR Tracks\CAD Files\Landscape\L2\L1,L2,L3,L4,L5,L6,L7,L8,L9,L10,L11.dwg



SYMBOL	SCIENTIFIC NAME	COMMON NAME	QTY	SIZE & COMMENTS
	PITHECELLOBIUM FLEXICAULE	EBONY TREE	4	3" CAL. B&B, STRONG CENTRAL LEADER
	ULMUS CRASSIFOLIA	CEDAR ELM	3	3" CAL. B&B, STRONG CENTRAL LEADER
	EHRETIA ANACUA	ANACUA TREE	5	3" CAL. B&B, STRONG CENTRAL LEADER

SYMBOL	DESCRIPTION	QTY
	4" VINYL FENCE	357 LF
	AREA LIGHTS	6
	TRASH RECEPTACLE	1
	CONCRETE PAD WITH BENCH	1

LEGEND					
FO	FIBER OPTICS LINE	16 W	16" WATER LINE		SEWER MANHOLE
8"SS	8" SANITARY SEWER LINE	24"W	24" WATER LINE		WATER VALVE
27"SS	27" SANITARY SEWER LINE		UTILITY WATER LINE		
2 G	2" GAS LINE		WATER VALVE		
4"W	4" WATER LINE	G	GAS METER		
12"W	12" WATER LINE	W	WATER METER		

CSJ NO:	
DATE:	01/06/16
SURVEYED BY:	00
DESIGNED BY:	00
DRAWN BY:	00
CHECKED BY:	00
PROJECT NO:	00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

LANDSCAPE IMPROVEMENTS
STA. 12+00 TO STA. 22+00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

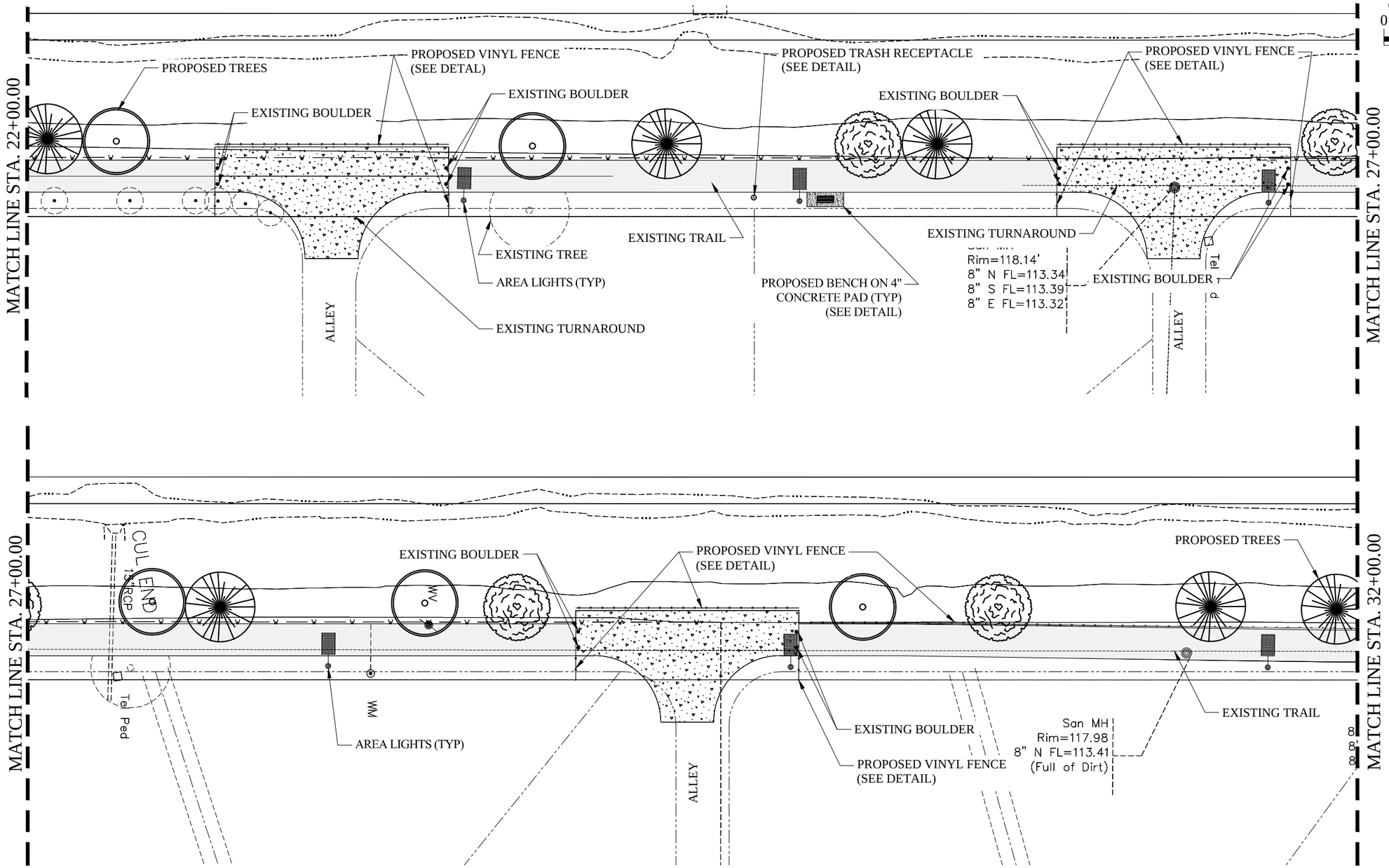
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REVISIONS:
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SEAL:

SHEET NO.:
L3

LAYOUT NAME: L3
DATE: AUG 08, 2018 - 1:34PM
LAST SAVED: AUG 06, 2018 - 11:49 AM
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GRAPHIC SCALE
0 20' 40'
1 INCH = 40' FT

SYMBOL	SCIENTIFIC NAME	COMMON NAME	QTY	SIZE & COMMENTS
	PITHECELLOBIUM FLEXICAULE	EBONY TREE	6	3" CAL. B&B, STRONG CENTRAL LEADER
	ULMUS CRASSIFOLIA	CEDAR ELM	5	3" CAL. B&B, STRONG CENTRAL LEADER
	EHRETIA ANACUA	ANACUA TREE	4	3" CAL. B&B, STRONG CENTRAL LEADER

SYMBOL	DESCRIPTION	QTY
	4" VINYL FENCE	526 LF
	AREA LIGHTS	6
	TRASH RECEPTACLE	1
	CONCRETE PAD WITH BENCH	1

LEGEND					
FO	FIBER OPTICS LINE	16 W	16" WATER LINE		SEWER MANHOLE
8"SS	8" SANITARY SEWER LINE	24"W	24" WATER LINE		WATER VALVE
27"SS	27" SANITARY SEWER LINE		UTILITY WATER LINE		
2 G	2" GAS LINE		WATER VALVE		
4"W	4" WATER LINE	G	GAS METER		
12"W	12" WATER LINE	W	WATER METER		

CSJ NO:	
DATE:	01/06/16
SURVEYED BY:	00
DESIGNED BY:	00
DRAWN BY:	00
CHECKED BY:	00
PROJECT NO:	00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

LANDSCAPE IMPROVEMENTS
STA. 22+00 TO STA. 32+00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" = 40'

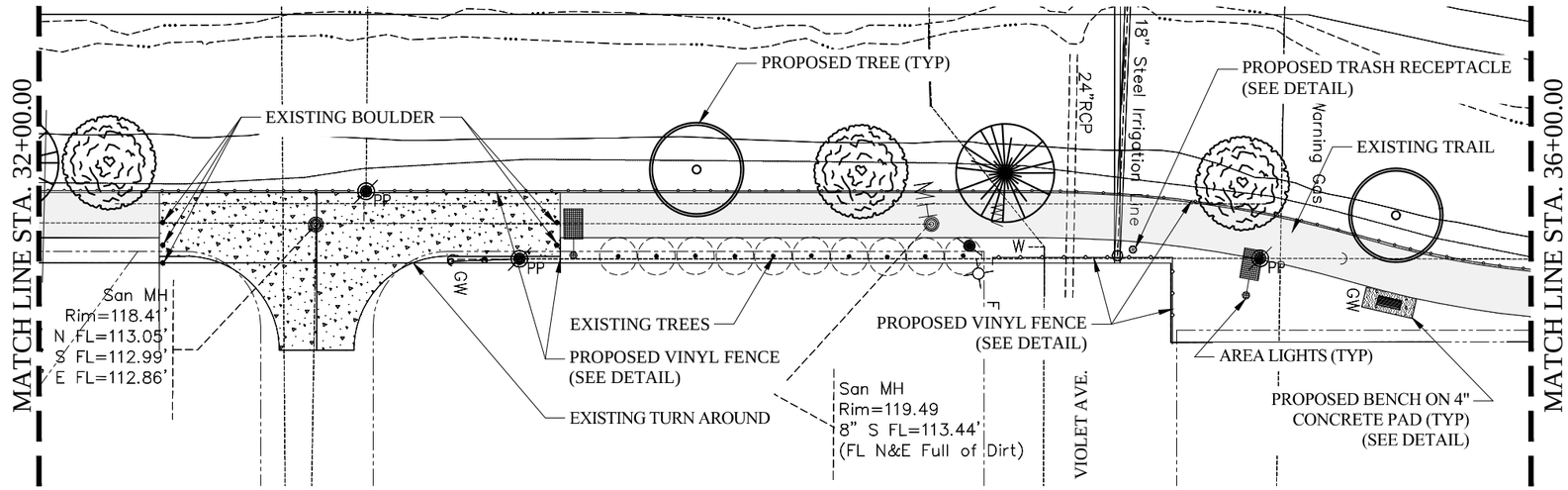
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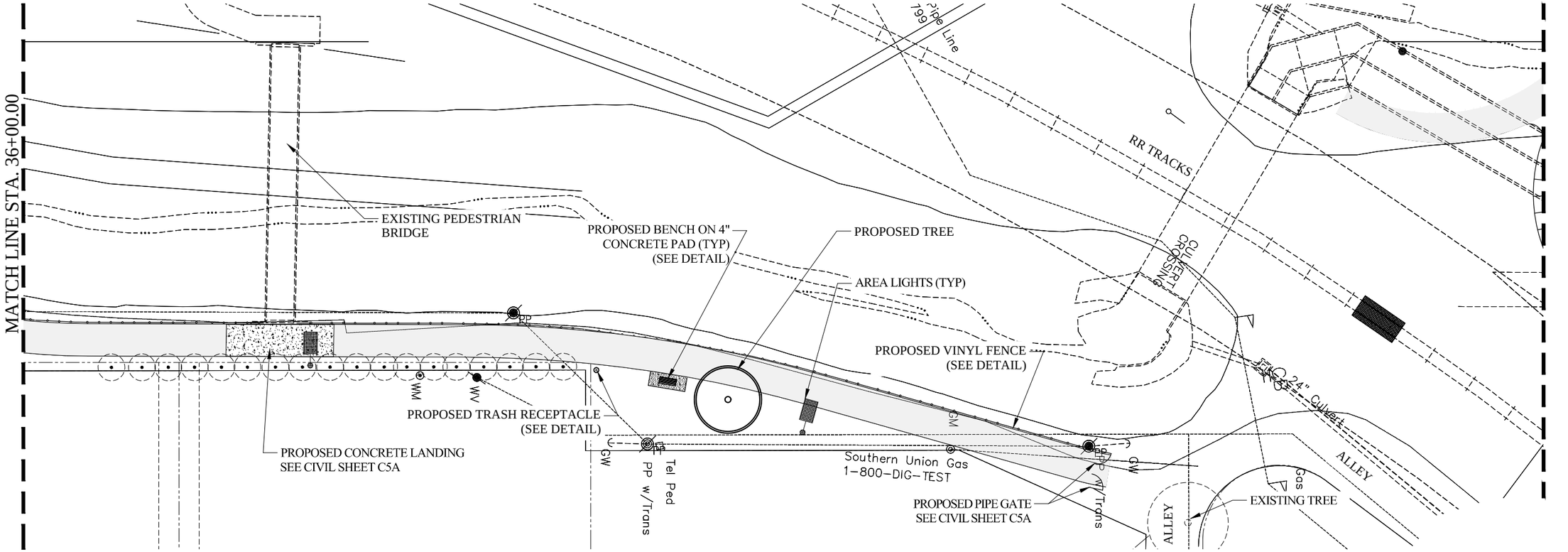
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SHEET NO.:
L4

LAYOUT NAME: L4
DATE: Aug 08, 2018 - 11:37m
LAST SAVED: Aug 08, 2018 - 11:36m
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GRAPHIC SCALE
0 20' 40'
1 INCH = 40' FT





SYMBOL	SCIENTIFIC NAME	COMMON NAME	QTY	SIZE & COMMENTS
	PITHECELLOBIUM FLEXICAULE	EBONY TREE	1	3" CAL. B&B, STRONG CENTRAL LEADER
	ULMUS CRASSIFOLIA	CEDAR ELM	3	3" CAL. B&B, STRONG CENTRAL LEADER
	EHRETIA ANACUA	ANACUA TREE	3	3" CAL. B&B, STRONG CENTRAL LEADER

SYMBOL	DESCRIPTION	QTY
	4" VINYL FENCE	886 LF
	AREA LIGHTS	4
	TRASH RECEPTACLE	2
	CONCRETE PAD WITH BENCH	2

LEGEND					
FO	FIBER OPTICS LINE	16 W	16" WATER LINE		SEWER MANHOLE
8"SS	8" SANITARY SEWER LINE	24"W	24" WATER LINE		WATER VALVE
27"SS	27" SANITARY SEWER LINE		UTILITY WATER LINE		
2 G	2" GAS LINE		WATER VALVE		
4"W	4" WATER LINE	G	GAS METER		
12"W	12" WATER LINE	W	WATER METER		

CSJ NO:	
DATE:	01/06/16
SURVEYED BY:	00
DESIGNED BY:	00
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CHECKED BY:	00
PROJECT NO:	00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

LANDSCAPE IMPROVEMENTS
STA. 32+00 TO STA. 40+00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

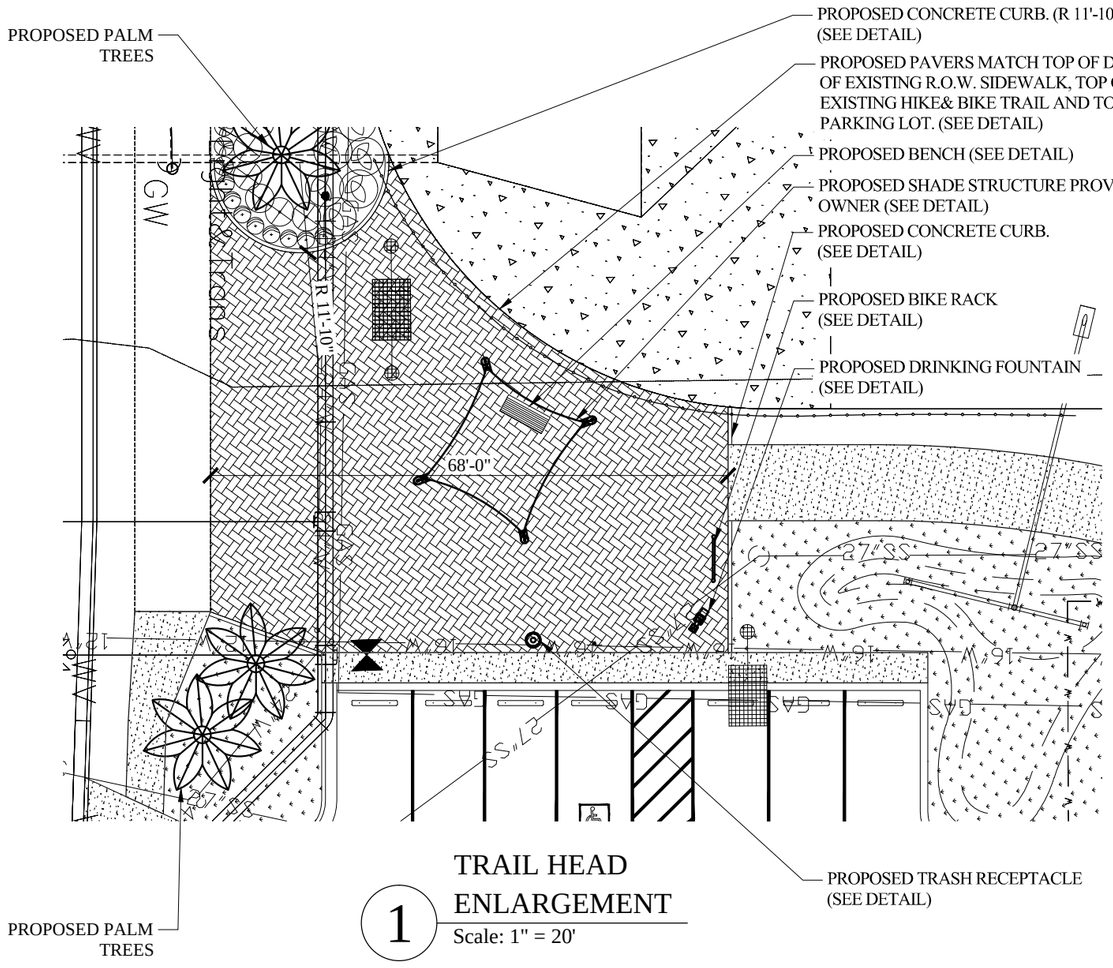
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REVISIONS:
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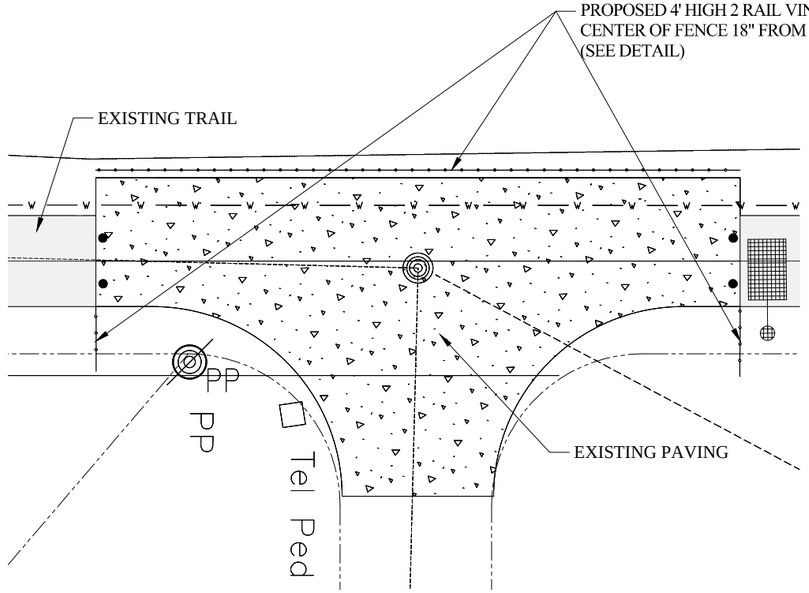
SEAL:

SHEET NO.:
L5

LAYOUT NAME: L5
DATE: Aug 08, 2018 - 11:41pm
LAST SAVED: Aug 08, 2018 - 11:40pm
DRAWING FILE: H:\PROJECTS\2017 BICENTENNIAL NOLANA TO RR TRACKS\CAD FILES\LANDSCAPE\L2,L3,L4,L5,L6,L7,L8,L9,L10,L11.DWG



1 TRAIL HEAD ENLARGEMENT
Scale: 1" = 20'



2 TURNAROUND ENLARGEMENT
Scale: 1" = 20'

GRAPHIC SCALE
0 10' 20'
1 INCH = 20' FT

SYMBOL	DESCRIPTION	QTY
	PAVERS	3,163 SF
	SHADE SHELTER	1
	DRINKING FOUNTAIN	1
	BIKE RACK	1
	PROPOSED TRASH RECEPTACLE	1

LEGEND					
FIBER OPTICS LINE		16" WATER LINE		SEWER MANHOLE	
8" SANITARY SEWER LINE		24" WATER LINE		WATER VALVE	
27" SANITARY SEWER LINE		UTILITY WATER LINE			
2" GAS LINE		WATER VALVE			
4" WATER LINE		GAS METER			
12" WATER LINE		WATER METER			

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

LANDSCAPE IMPROVEMENTS
SITE ENLARGEMENTS

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

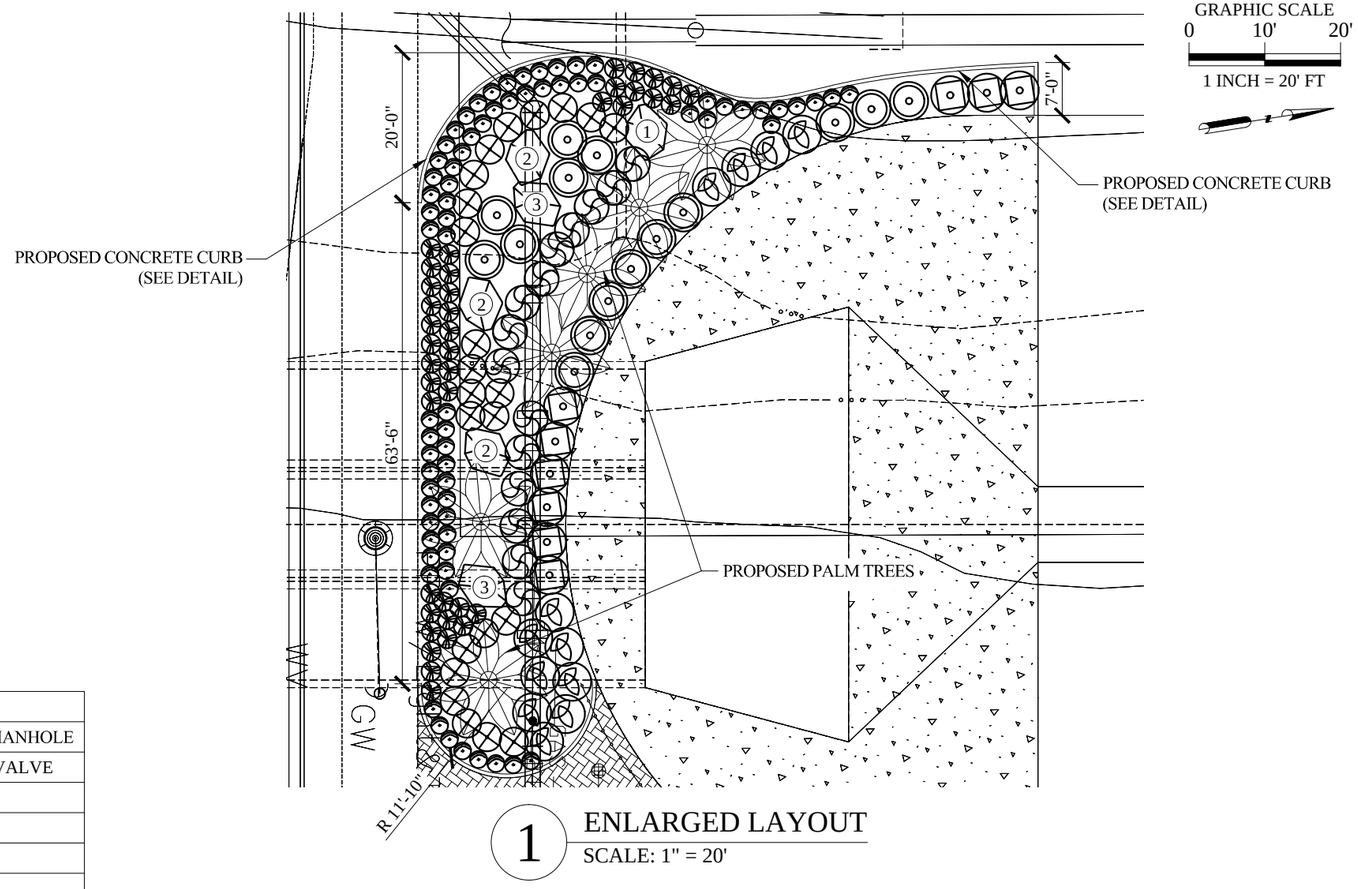
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REVISIONS:
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SEAL:

SHEET NO.:
L6

LAYOUT NAME: L6 NEW
DATE: AUG 08, 2018 - 10:28AM
LAST SAVED: AUG 08, 2018 - 9:54AM
DRAWN AT C:\BICENTENNIAL HIKE & BIKE TRAIL NOLANA TO RR TRACKS\CAD FILES\LANDSCAPE\L1,2,3,4,L5,6,7,8,9,10,11.DWG

SYMBOL	COMMON NAME	SCIENTIFIC NAME	QTY	SIZE	SPACING
	BIRD OF PARADISE	STRELITZIA REGINAE	12	5 GAL	PER PLANS
	TURK'S CAP	MALVAVISCUS DRUMMONDII	15	5 GAL	PER PLANS
	BOUGAINVILLEA	BOUGAINVILLEA (FUCHSIA VARIETY)	9	5 GAL	PER PLANS
	TEXAS SAGE	LEUCOPHYLLUM FRUTESCENS	15	5 GAL	PER PLANS
	LINDHEIMER MUHLY GRASS	MUHLENBERGIA LINDHEIMERI	23	3 GAL	PER PLANS
	ORANGE ZEXMENIA	WEDELIA HISPIDA	40	3 GAL	PER PLANS
	GREGG'S MIST FLOWER	CONOCLINIUM GREGGII	72	3 GAL	PER PLANS
---	McALLEN MULCH	SEE PLANS FOR LOCATION. MULCH DEPTH & MATERIAL LISTED ON THE SPECS. MULCH SUPPLIED BY CONTRACTOR TO TRANSPORT AND INSTALL. PROVIDE SAMPLE.			
	BOULDER	① 200 LBS	1	--	PER PLANS
		② 400 LBS	3	--	
		③ 600 LBS	2	--	

LEGEND					
FO FO FO	FIBER OPTICS LINE	16"W 16"W 16"W	16" WATER LINE		SEWER MANHOLE
8"SS 8"SS	8" SANITARY SEWER LINE	24"W 24"W 24"W	24" WATER LINE		WATER VALVE
27"SS 27"SS	27" SANITARY SEWER LINE		UTILITY WATER LINE		
2 G 2 G	2" GAS LINE		WATER VALVE		
4"W 4"W	4" WATER LINE	G	GAS METER		
12"W 12"W 12"W	12" WATER LINE	W	WATER METER		



1 ENLARGED LAYOUT
SCALE: 1" = 20'

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

LANDSCAPE IMPROVEMENTS
SITE ENLARGEMENTS

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" = 20'

REVISIONS:
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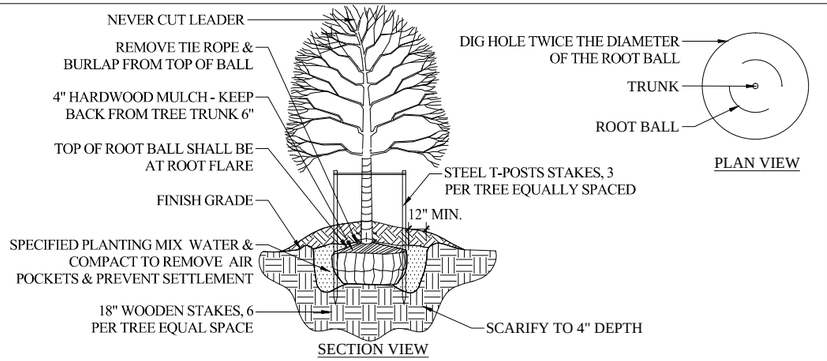
SHEET NO.: L7

LAYOUT NAME: L7 NEW
DATE: AUG 08, 2018 - 11:48PM
LAST SAVED: AUG 08, 2018 - 11:48PM
DRAWING FILE: I:\ENGINEERING\L7\2017 BICENTENNIAL NOLANA TO RR TRACKS\CAD FILES\LANDSCAPE\L2\L3\L4\L5\L6\L7\L8\L9\L10\L11.DWG

SITE EQUIPMENT SCHEDULE					
ITEM	MANUFACTURER	MODEL #	COLOR	COMMENTS	QTY
TRASH RECEPTACLE & LID	WABASH VALLEY OR APPROVED EQUAL	LR300R	MATCH EXISTING	32 GALLON RIB OPTION INCLUDE 14" DOME LID	5
TRASH RECEPTACLE LINER	WABASH VALLEY OR APPROVED EQUAL	LR310N	MATCH EXISTING	DRILL FOUR 1/4" DRAIN HOLES IN BOTTOM OF LINER	5
SHADE STRUCTURE	POLIGON OR APPROVED EQUAL	ARC 16X18	TO BE PROVIDED BY OWNER	PROVIDED BY OWNER / INSTALLED BY CONTRACTOR PER MANUFACTURER'S SPECIFICATIONS	1
DRINKING FOUNTAIN	HAWS CORP. OR APPROVED EQUAL	3500D			1
ROLLER COASTER BIKE RACK	PW ATHLETIC OR APPROVED EQUAL	1602-07-DC-1/ DC-2			1
VINYL FENCE	MASTER HALCO OR APPROVED EQUAL	LEGEND 2-RAIL	WHITE	N/A	1,876 LF
BENCH	WABASH VALLEY	SG302D	GREEN /BLACK	SEAT AND BACK COLOR GREEN / FRAME COLOR BLACK	5

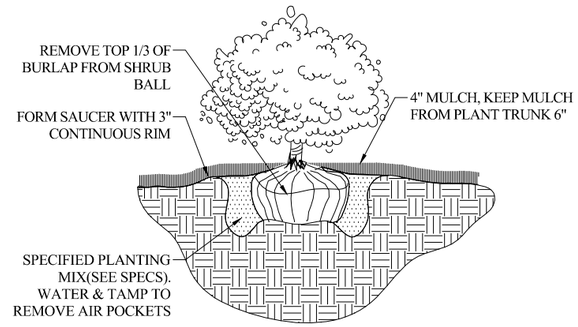
1. ALL HARDWARE REQUIRED FOR SITE FURNITURE SHALL BE PROVIDED BY THE CONTRACTOR.
2. ENGINEERED DRAWINGS ARE REQUIRED FOR ALL PICNIC SHELTERS AND PAVILION AND SHALL BE SUPPLIED BY THE CONTRACTOR.

1/SD-1 SITE EQUIPMENT SCHEDULE SCALE: N.T.S.



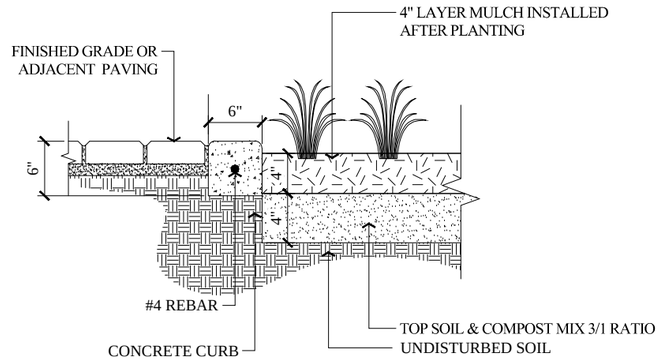
NOTE:
1. FOR EACH ONE (1) INCH CALIPER OF TREE TRUNK DIAMETER INSTALL ONE 21 GRAM AGRIFORM PLANTING TABLET. INSTALL HALF-WAY UP THE ROOTBALL 1" FROM ROOT TIPS.
2. SET TOP OF ROOT CROWN 1" ABOVE FINISHED GRADE WHERE APPLICABLE. TRIM FABRIC AROUND TRUNK OF TREE.
3. REMOVE ALL PLASTIC OR POLYETHYLENE MESH FROM ROOT BALLS.
4. REMOVE ALL NYLON TYING STRING.
5. STEEL CAGING TO BE REMOVED BY 2/3rds.

2/SD-1 TREE PLANTING SCALE: N.T.S.

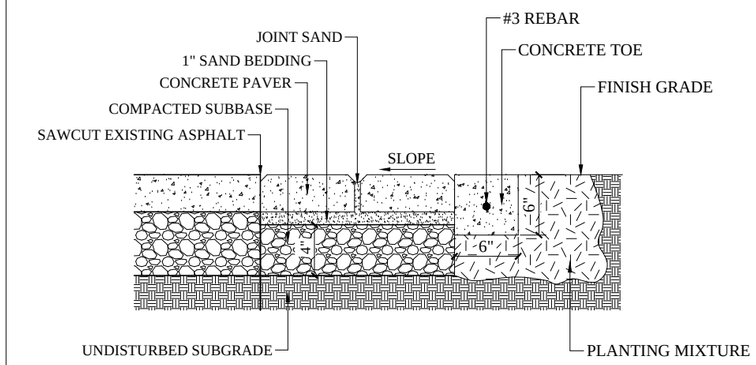


NOTE:
1. SET TOP OF ROOT CROWN 1" ABOVE FINISHED GRADE WHERE APPLICABLE. TRIM FABRIC AROUND TRUNK OF TREE.
2. REMOVE ALL PLASTIC OR POLYETHYLENE MESH FROM ROOT BALLS.
3. REMOVE ALL NYLON TYING STRING.
4. STEEL CAGING TO BE REMOVED BY 2/3rds.

3/SD1 SHRUB PLANTING SCALE: N.T.S.

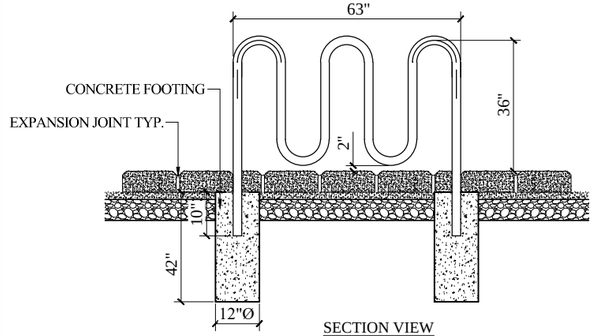


4/SD-1 CONCRETE CURB EDGE SCALE: N.T.S.



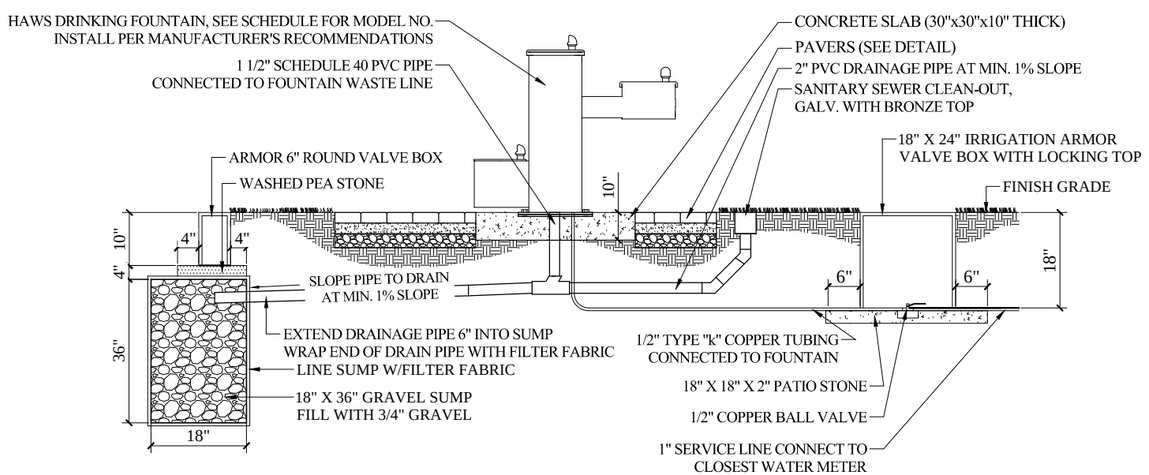
NOTES:
1. CONFIRM COLOR AND SIZE WITH OWNER PRIOR TO INSTALLATION. PROVIDE MOCK-UP AS SPECIFIED.

5/SD-1 CONCRETE PAVER SCALE: N.T.S.

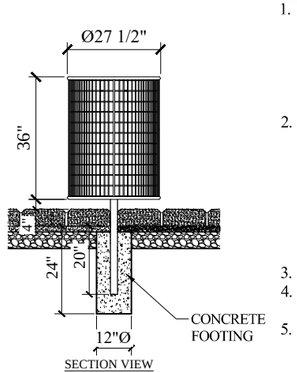


NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

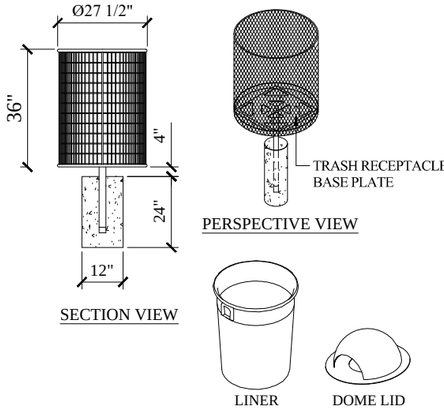
6/SD-1 IN-GROUND BIKE RACK SCALE: N.T.S.



7/SD-1 DRINKING FOUNTAIN SCALE: N.T.S.



NOTES:
1. WHERE THE RECEPTACLE IS PLACED ON A CONCRETE FOOTING THE CENTER OF THE RECEPTACLE WILL BE LOCATED IN THE CENTER OF SAID CONCRETE FOOTING, UNLESS OTHERWISE NOTED.
2. RECEPTACLES MUST BE BOLTED DOWN WITH BOLTS AND LOCK TIGHT MUST BE APPLIED. BOLTS MUST BE INSTALLED THROUGH THE FOUR PRE-DRILLED HOLES IN THE TRASH RECEPTACLE BASE PLATE DIRECTLY INTO THE 24"MIN. CONCRETE FOOTING.
3. ALL DIMENSIONS IN INCHES.
4. CONTRACTOR TO INCLUDE LID & LINER FOR TRASH RECEPTACLE.
5. CONTRACTOR TO SEE INSTALLATION FOR EQUIPMENT BY MANUFACTURER SPECIFICATIONS.



8/SD-1 TRASH RECEPTACLE DETAIL SCALE: N.T.S.

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT NOLANA AVE TO RR TRACKS

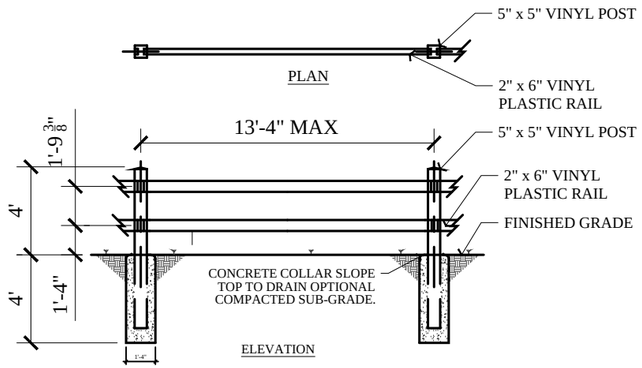
LANDSCAPE IMPROVEMENTS SITE DETAILS 1

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" =
REVISIONS: 1. 2. 3. 4.
SEAL:

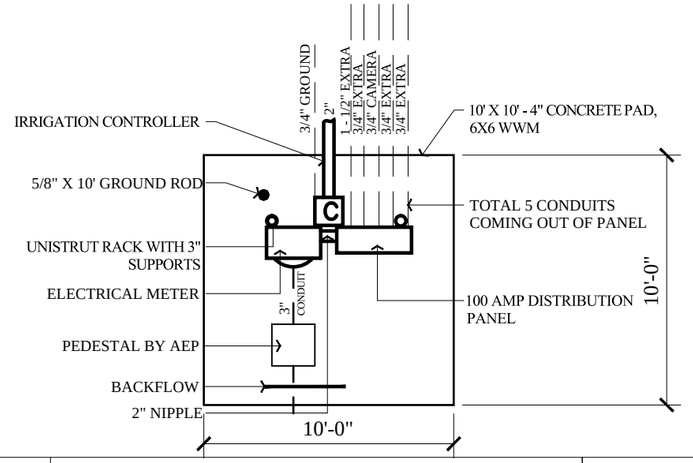
SHEET NO.: SD1

LAYOUT NAME: SD1
DATE: Aug 08, 2018 - 1:51PM
LAST SAVED: Aug 06, 2018 - 11:06AM
SAVED FILE: H:\HORIZONTAL\CAD FILES\LANDSCAPE\SD1_SD2_SD3.DWG

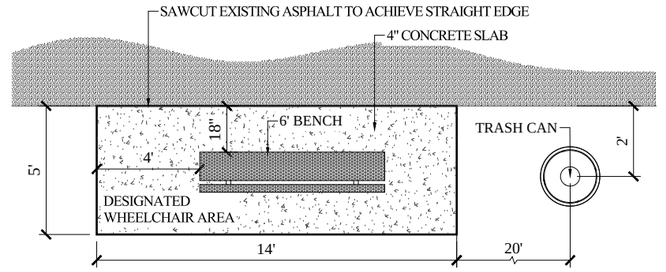


NOTE:
- COLOR TO BE WHITE AS PER MANUFACTURERS SPECIFICATIONS.
- FOR STEEP AREAS, SLOPE RAILS TO RESPOND TO SURROUNDING GRADE.

1/SD-2 | 2 PLANK VINYL FENCE | SCALE: N.T.S.

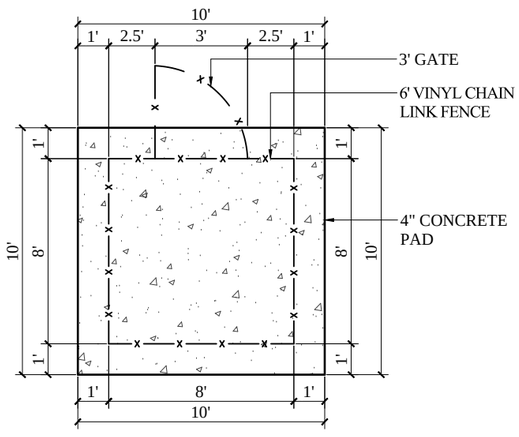


2/SD-2 | POWER SUPPLY SCHEMATIC | SCALE: N.T.S.

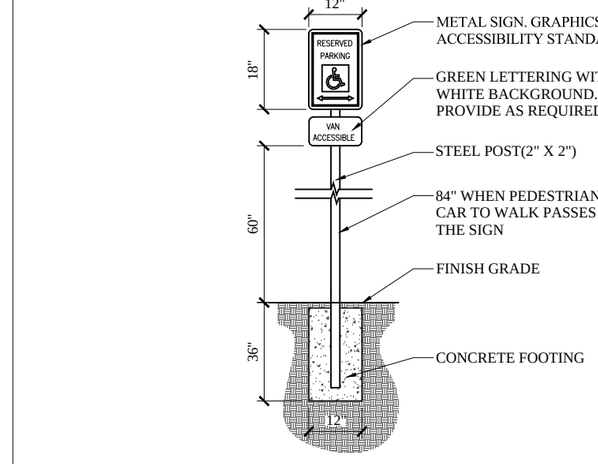


NOTES:
REFER TO MANUFACTURER SPECIFICATION.

3/SD-2 | BENCH PAD WITH TRASH RECEPTACLE | SCALE: N.T.S.

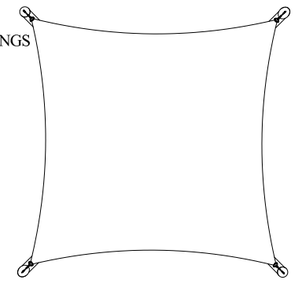


4/SD-2 | UTILITY PAD AND FENCE LAYOUT | SCALE: N.T.S.

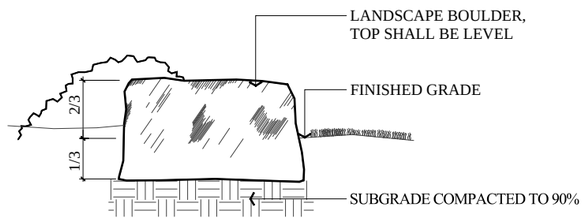


5/SD-2 | ADA PARKING SIGNAGE | SCALE: N.T.S.

NOTES:
1. THE OWNER WILL PROVIDE ENGINEERING DRAWINGS WHICH HAVE ADDITIONAL DETAIL NEEDED TO CONSTRUCT THE FOOTINGS AND STRUCTURE.
2. THE MINIMUM SIZES OF THE FOOTINGS ARE INDICATED BY THE MANUFACTURER.
3. THE STRUCTURE WILL BE AFFIXED UTILIZING A PLATE ON CONCRETE PIER SYSTEM.
4. A REBAR CAGE WILL BE NECESSARY AND THE SIZE OF WHICH WILL BE DETERMINED BY THE ENGINEERED DRAWINGS.
5. INSTALL THE STRUCTURE PER MANUFACTURER RECOMMENDATIONS.
6. THIS STRUCTURE MUST BE INSTALLED PRIOR TO INSTALLING CONCRETE PAVERS
7. FABRIC HYPAR 16' X 18' SHADE STRUCTURE OR EQUAL TO.

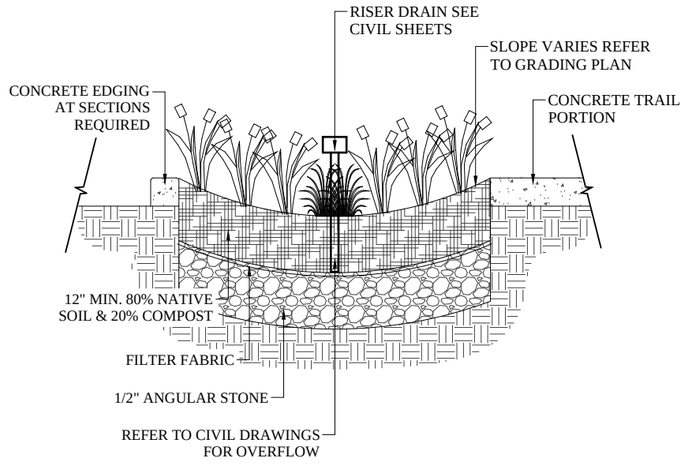


6/SD-2 | SHADE STRUCTURE | SCALE: N.T.S.



NOTES:
1. BOULDERS SHALL BE BURIED UP TO 1/3 OF THEIR TOTAL HEIGHT.
2. BOULDERS SHALL BE PLACED ON A BED OF COMPACTED SUBGRADE.
3. THE ORIENTATION OF THE BOULDER SHALL BE SELECTED IN THE FIELD BY THE ENGINEER/ARCHITECT.
4. THE CONTRACTOR SHALL STAKE THE LOCATION OF THE BOULDER FOR FIELD APPROVAL BY THE ENGINEER/ARCHITECT.
5. ALL BOULDERS SHALL BE APPROVED BY THE ENGINEER/ARCHITECT PRIOR TO DELIVERY TO THE SITE. ANY BOULDERS DELIVERED TO THE SITE WITHOUT PRIOR APPROVAL MAY BE REJECTED.
6. THE BOULDERS SHALL BE A LAMPASAS LIMESTONE TYPE. REFER TO PLANS FOR MIN. WEIGHT.

7/SD-2 | BOULDERS | SCALE: N.T.S.



8/SD-2 | BIOSWALE SECTION | SCALE: N.T.S.

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

LANDSCAPE IMPROVEMENTS
SITE DETAILS 2

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

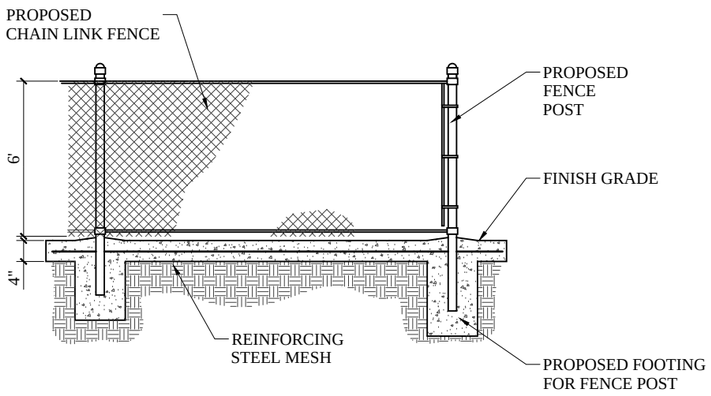
SCALE: HOR: 1" =

REVISIONS:
1.
2.
3.
4.

SEAL:

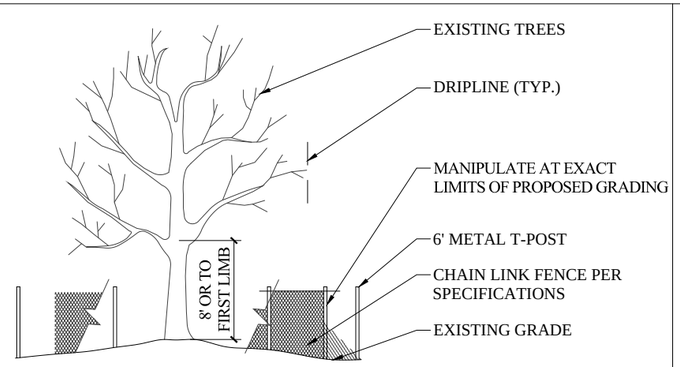
SHEET NO.:
SD2

LAYOUT NAME: SD2
DATE: MAY 08, 2018 - 11:41PM
LAST SAVED: MAY 08, 2018 - 11:35PM
PLOTTED: FILE: I:\ENGINEERING\ 2017 ZACHENNIAL NOLANA TO RR TRACKS\CAD FILES\LANDSCAPE\SD\SD2-SD3.DWG



SECTION VIEW

1/SD-3 6' VINYL CHAIN LINK FENCE SCALE: N.T.S.



NOTE:

- ANY TREE PRUNING MUST HAVE PRIOR APPROVAL BY LANDSCAPE ARCHITECT. REFER TO PLANTING PLAN FOR PLANT DEMO.
- TREE PROTECTION MATERIAL WILL BE INSTALLED BY OWNER & MAINTAINED BY CONTRACTOR DURING CONSTRUCTION.

2/SD-3 TREE PROTECTION FENCING SCALE: N.T.S.

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

LANDSCAPE IMPROVEMENTS
SITE DETAILS 3

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

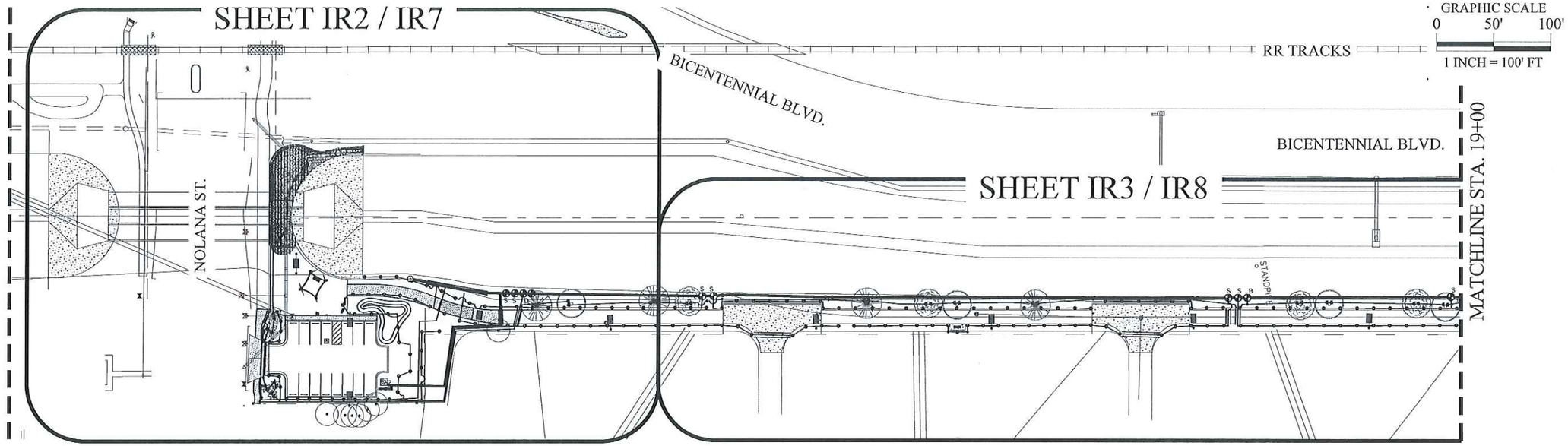
SCALE: HOR: 1" =

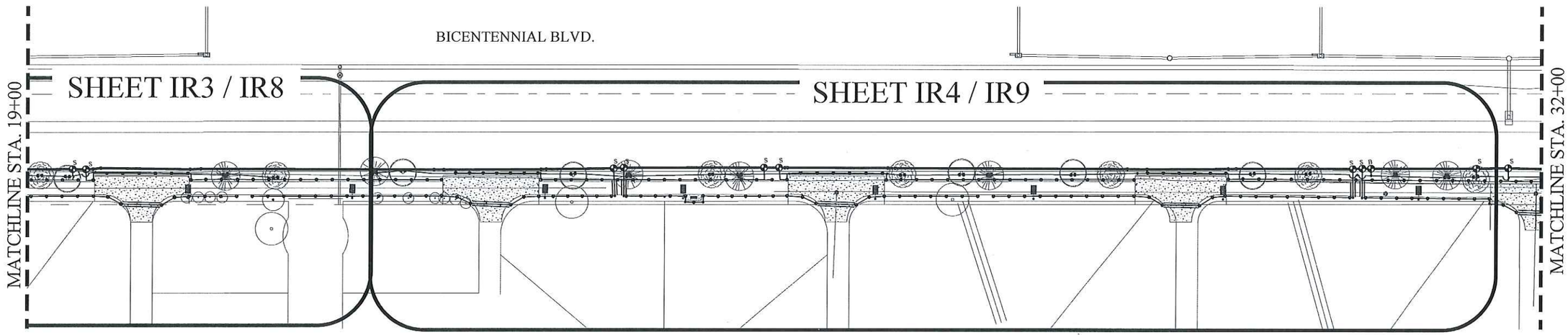
REVISIONS:
1.
2.
3.
4.

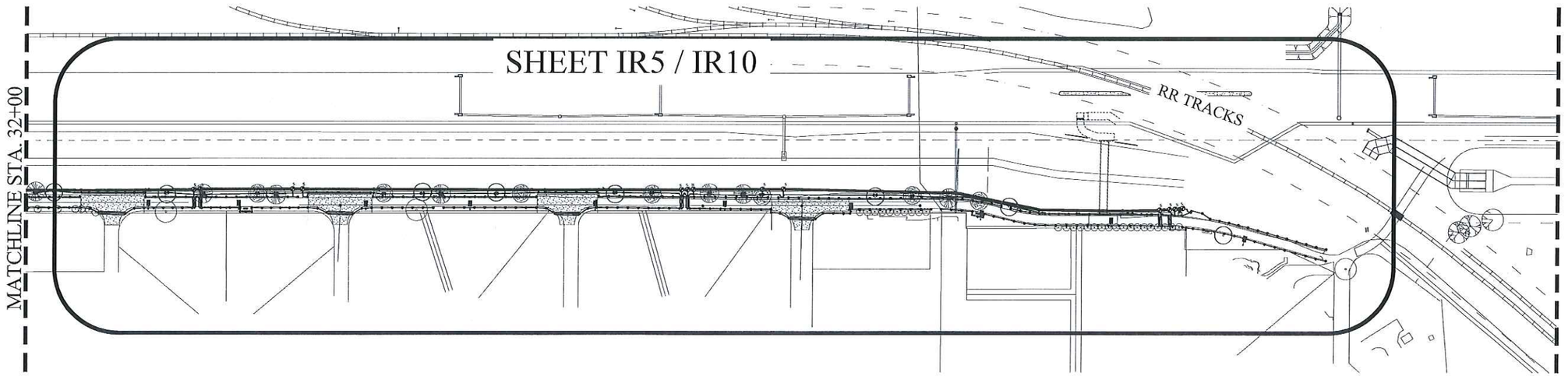
SEAL:

SHEET NO.:
SD3

LAYOUT NAME: SD3
DATE: MAY 08, 2018 - 1:42PM
LAST SAVED: MAY 08, 2018 - 1:35PM
DRAWN BY: K:\MISCELLANEOUS\CAD FILES\LANDSCAPE\SD1,SD2,SD3.DWG







LAYOUT NAME: IR1
DATE: MAY 08, 2018 - 1:51PM
LAST SAVED: MAY 08, 2018 - 1:50PM
DRAWING FILE: H:\MCALLEN\NOLANA\CIVIL\DEPARTMENTAL NOLANA TO RR TRACKS\CAD FILES\IRRIGATION\IR1.DWG

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

IRRIGATION IMPROVEMENTS
OVERALL LAYOUT

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" =100'

REVISIONS:
1.
2.
3.
4.

SEAL:
STATE OF TEXAS
JOSE L. DE LA PAZ
8834
LICENSED LANDSCAPE ARCHITECT
5-12-18

SHEET NO: IR1

BICENTENNIAL BLVD.

NOLANA AVE.

MATCH LINE STA. 12+00.00

SEE ENLARGEMENT
SHEET 1/IR6

GRAPHIC SCALE
0 20' 40'
1 INCH = 40' FT

Southern Union Gas
1-800-DIG-TEST

18" CIC Gas Pipe

Existing Pipe

Stm MH
RIM=117.70'
36"E FL=105.19'
24"SW FL=105.12'

San MH
Rim=116.58'
8" S FL=111.08'

6" SLEEVE

27"SS

LEGEND	
D	DRIP VALVE
S	SPRAY VALVE
B	BUBBLER VALVE

M METER
P POWER
C CONTROLLER

CSJ NO.	
DATE:	01/06/16
SURVEYED BY:	00
DESIGNED BY:	00
DRAWN BY:	00
CHECKED BY:	00
PROJECT NO:	00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

DRIP & BUBBLER IRRIGATION IMPROVEMENTS
SEG. NOLANA ST. TO STA. 12+00

CITY OF
McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" = 40'

REVISIONS:
1.
2.
3.
4.

SEAL:
STATE OF TEXAS
JOSE L. DE LA PAZ
8834
LICENSED IRRIGATOR

SHEET NO.:
IR2

LAYOUT NAME: IR2
DATE: Aug 08, 2018 - 11:15AM
LAST SAVED: Jul 12, 2018 - 9:51AM
DRAWING FILE: H:\BICENTENNIAL\2017-BICENTENNIAL NOLANA TO RR TRACKS\CAD FILES\IRRIGATION\IR2,IR3,IR4,IR5.DWG

GRAPHIC SCALE
0 20' 40'
1 INCH = 40' FT

MATCH LINE STA. 12+00.00

2" 2" S S 2" 4" 2" 2"

15"RCP 18"RCP 18"RCP

GM Water Valve

San. MH
RIM=115.31'
8"N FL=112.71'

GM WM

Tel Ped

EXISTING SLEEVE

EXISTING SLEEVE

MATCH LINE STA. 17+00.00

MATCH LINE STA. 17+00.00

2½" S S B 2½" 1½" 1¼" 1" S S 4" 1" ¾"

41.0 2" 36" RCP STANDPIPE

WV

CUL END

15" RCP

18" Water Pipe

OF FH

San MH
Rim=116.99'
8" S FL=112.19'
8" E FL=112.09'

EXISTING SLEEVE

REDBUD AVE.

LEGEND	
D	DRIP VALVE
S	SPRAY VALVE
B	BUBBLER VALVE

MATCH LINE STA. 22+00.00

CSJ NO:	
DATE:	01/06/16
SURVEYED BY:	00
DESIGNED BY:	00
DRAWN BY:	00
CHECKED BY:	00
PROJECT NO:	00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

BUBBLER IRRIGATION IMPROVEMENTS
STA. 12+00 TO STA. 22+00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" = 40'

REVISIONS:
1.
2.
3.
4.

SEAL:
STATE OF TEXAS
JOSE L. DE LA PAZ
8834
LICENSED LANDSCAPE ARCHITECT
7/12/18

SHEET NO. IR3

LAYOUT NAME: IR3
DATE: MAY 08, 2018 - 2:56pm
LAST SAVED: MAY 08, 2018 - 2:54pm
DRAWING FILE: H:\ENGINEERING\2017-ENGINEERING NOLANA TO RR TRACKS\Cad Files\Irrigation\IR2-IR3-IR4-IR5.dwg

GRAPHIC SCALE
0 20' 40'
1 INCH = 40' FT

MATCH LINE STA. 22+00.00

END

3/4"

S S

1"

4"

S S

1¼"

EXISTING SLEEVE

ALLEY

San MH
Rim=118.14'
8" N FL=113.34'
8" S FL=113.39'
8" E FL=113.32'

Tel Ped

EXISTING SLEEVE

MATCH LINE STA. 27+00.00

MATCH LINE STA. 27+00.00

CUL-E-VERT

1½"

1½"

4"

WM

2"

S S B

22 44.0

2"

2½"

2"

2"

Tel Ped

WM

EXISTING SLEEVE

ALLEY

San MH
Rim=117.98
8" N FL=113.41
(Full of Dirt)

Rim=
8" N FL=
8" S FL=
8" E FL=

MATCH LINE STA. 32+00.00

LEGEND	
D	DRIP VALVE
S	SPRAY VALVE
B	BUBBLER VALVE

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

BUBBLER IRRIGATION IMPROVEMENTS
STA. 22+00 TO STA. 32.00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" = 40'

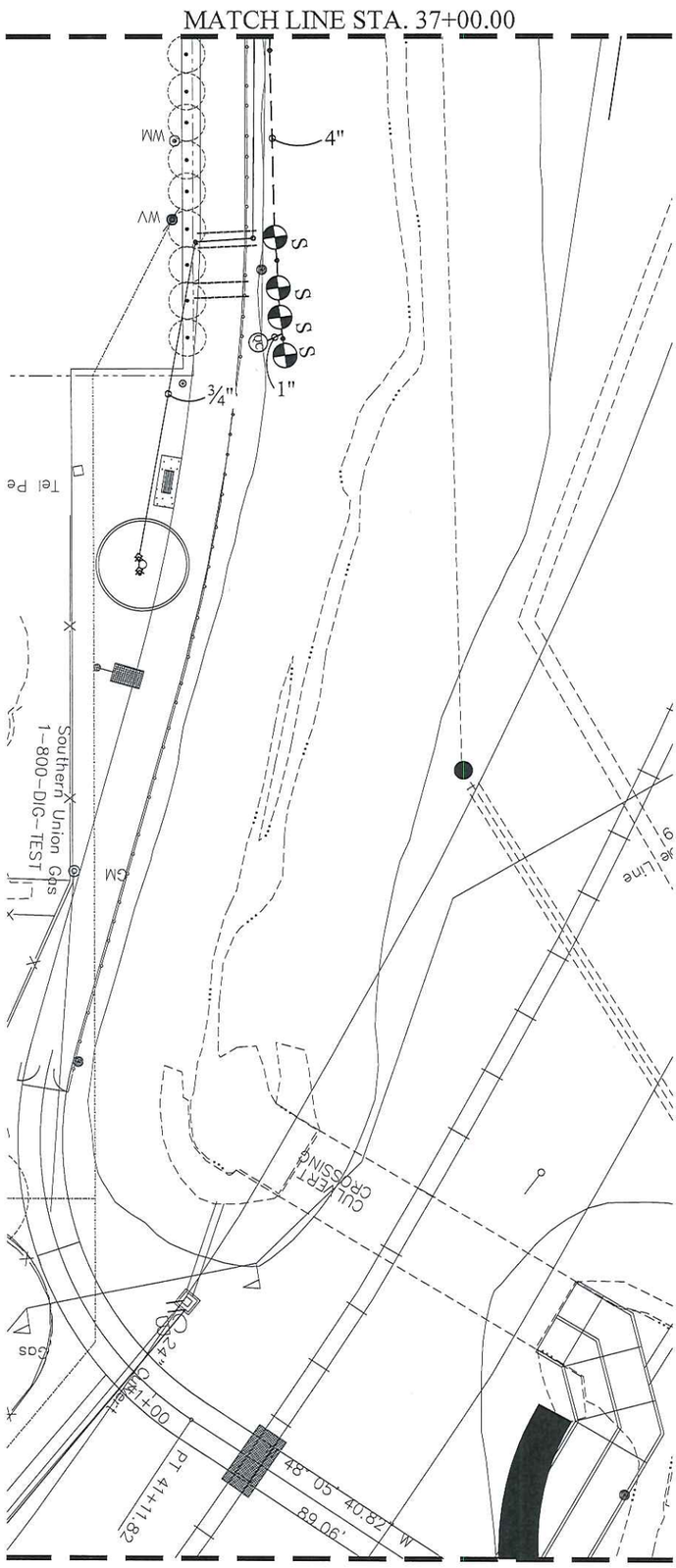
REVISIONS:
1.
2.
3.
4.

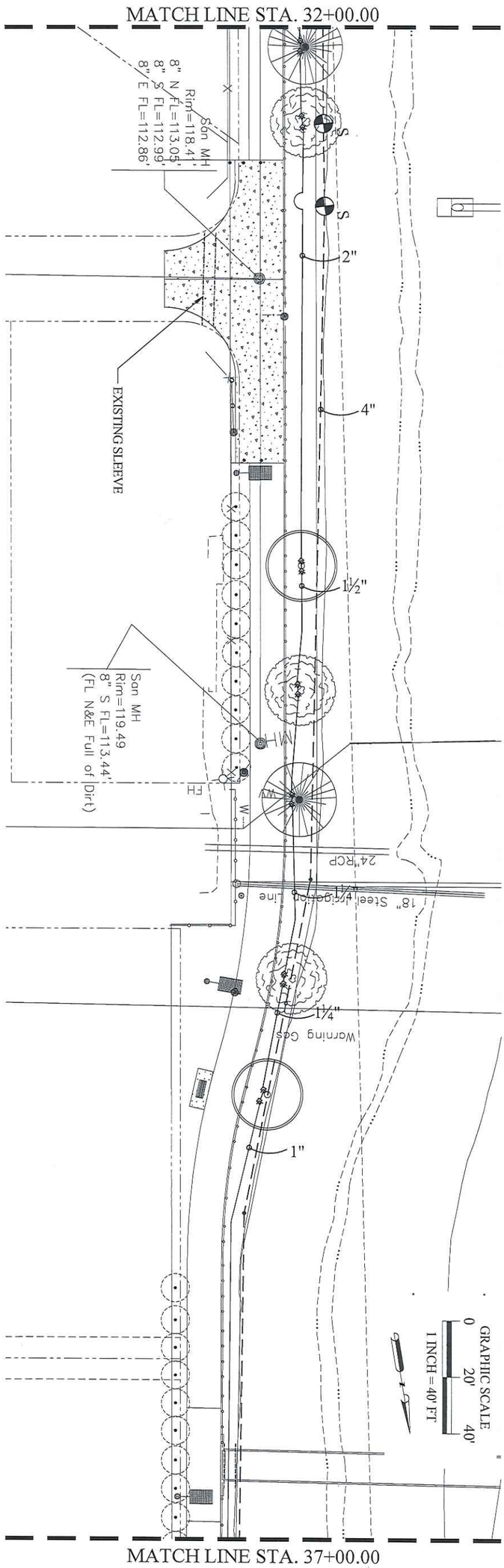
SEAL:
STATE OF TEXAS
JOSE L. DE LA PAZ
8834
LICENSED IRRIGATOR

SHEET NO.:
IR4

LAYOUT NAME: IR4
DATE: Aug 08, 2018 - 11:43am
LAST SAVED: Aug 08, 2018 - 11:25am
DRAWING FILE: H:\BICENTENNIAL NOLANA TO RR TRACKS\CAD FILES\IRRIGATION\IR2,IR3,IR4,IR5.dwg

Layout Name: IR5
Date: Aug 08, 2018 - 11:47am
Last Saved: Aug 08, 2018 - 11:25am
Drawing File: H:\Bicentennial\2017-Bicentennial Nolana to RR Tracks\Cad Files\Irrigation\IR2,IR3,IR4,IR5.dwg





LEGEND	
D	DRIP VALVE
S	SPRAY VALVE
B	BUBBLER VALVE

SHEET NO: IR5

REVISIONS:
1.
2.
3.
4.
SEAL:

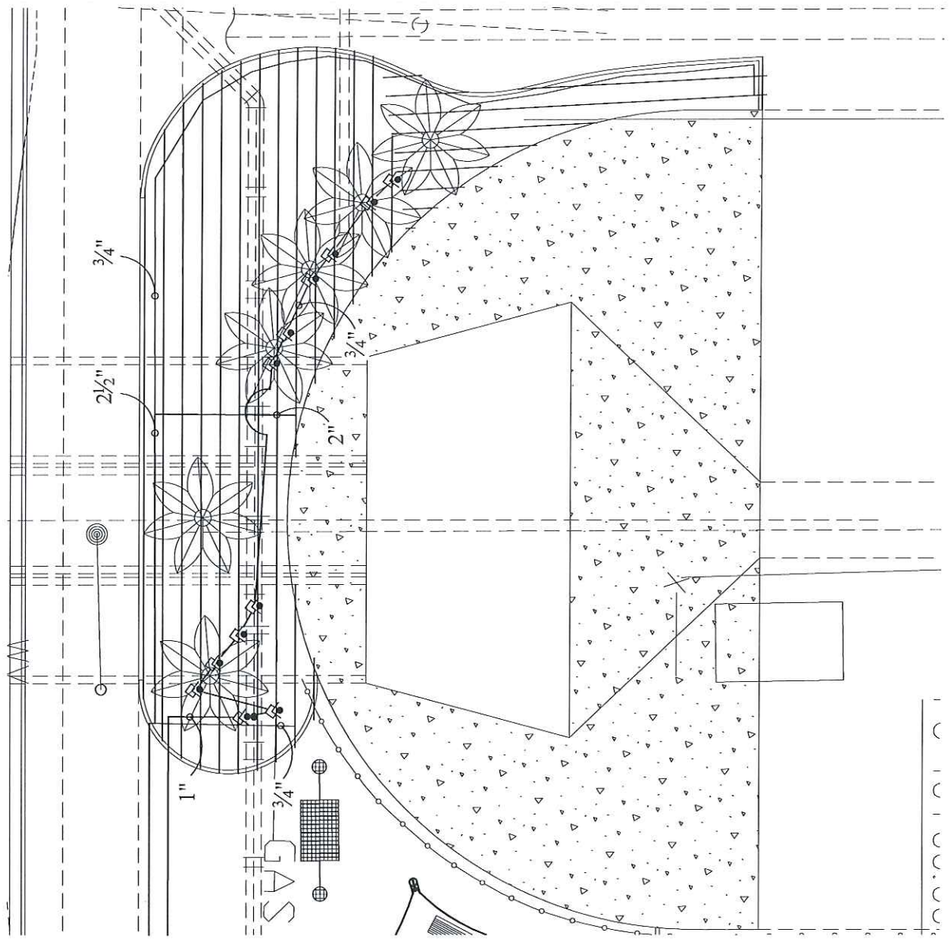
SCALE: HOR: 1" = 40'

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

BUBBLER IRRIGATION IMPROVEMENTS
32+00 TO STA. 40+00

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000



1 ENLARGED LAYOUT SHEET IR2
SCALE: 1" = 20'

GRAPHIC SCALE
0 10' 20'
1 INCH = 20' FT

LEGEND	
D	DRIP VALVE
S	SPRAY VALVE
B	BUBBLER VALVE

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

DRIP & BUBBLER IRRIGATION
IMPROVEMENTS SITE ENLARGEMENTS

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" = 20'
REVISIONS:
1.
2.
3.
4.
SEAL:

STATE OF TEXAS
JOSE L. DE LA PAZ
8834
LICENSED IRRIGATOR

SHEET NO.:
IR6

LAYOUT NAME: IR6
DATE: AUG 08, 2018 - 11:51AM
LAST SAVED: MAY 08, 2018 - 2:08PM
DRAWING FILE: H:\BICENTENNIAL\2017-BICENTENNIAL NOLANA TO RR TRACKS\CAD FILES\IRRIGATION\IR6.DWG

BICENTENNIAL BLVD.

CONTRACTOR TO CONNECT TO EXISTING IRRIGATION MAIN LINE.

GRAPHIC SCALE
0 20' 40'
1 INCH = 40' FT

NOLANA AVE.

MATCH LINE STA. 12+00.00

Stm MH
RIM=117.70'
36"E FL=105.19'
24"SW FL=105.12'

San MH
Rim=116.58'
8" S FL=111.08'

LEGEND	
D	DRIP VALVE
S	SPRAY VALVE
B	BUBBLER VALVE

CSJ NO:	
DATE:	01/06/16
SURVEYED BY:	00
DESIGNED BY:	00
DRAWN BY:	00
CHECKED BY:	00
PROJECT NO:	00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

SPRAY IRRIGATION IMPROVEMENTS
SEG. NOLANA ST. TO STA. 12+00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" = 40'

REVISIONS:
1.
2.
3.
4.

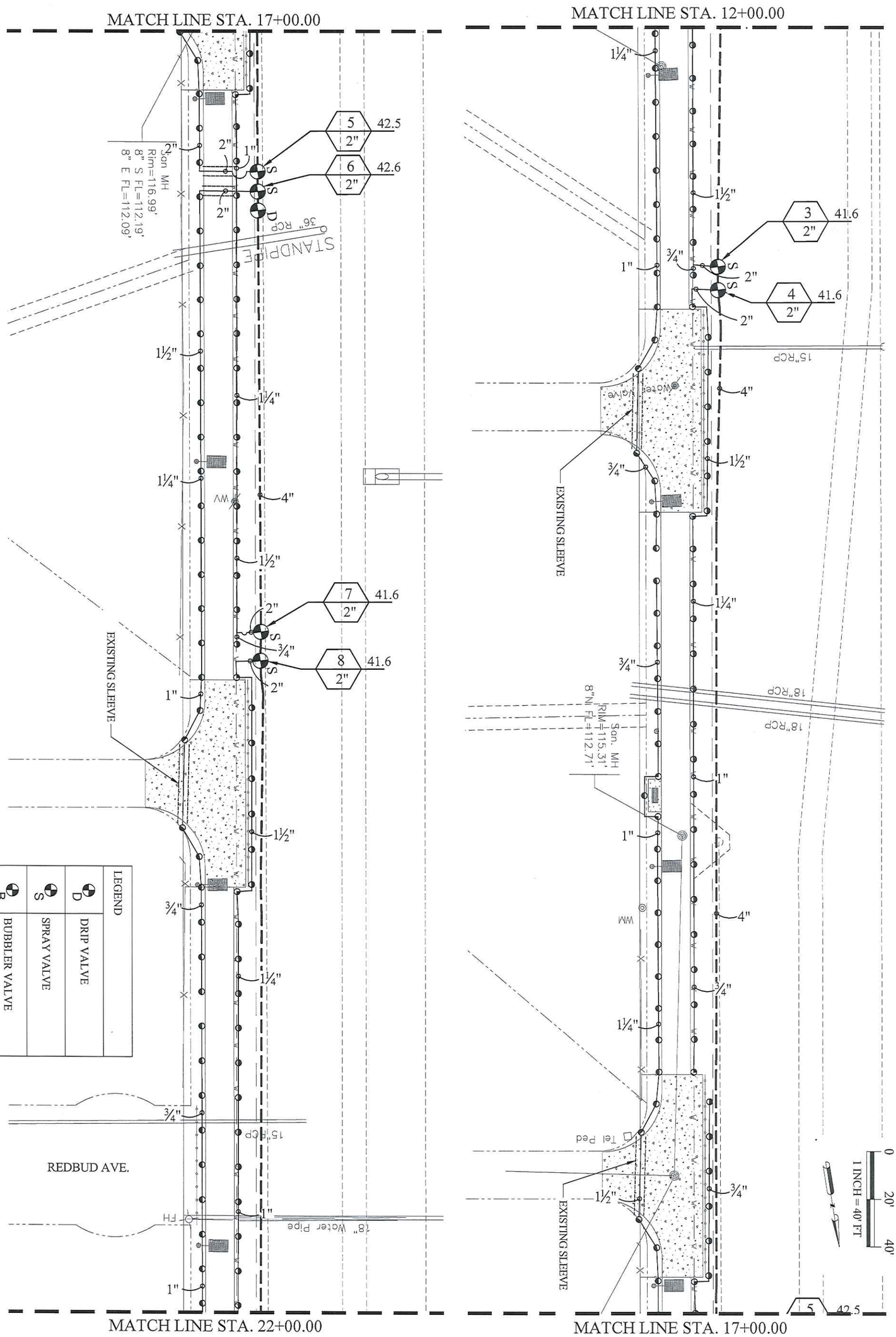
SEAL:
STATE OF TEXAS
JOSE L. DE LA PAZ
6834
LICENSED IRRIGATOR

7-12-16

SHEET NO.
IR7

LAYOUT NAME: IR7
DATE: May 09, 2016 - 2:12pm
LAST SAVED: May 09, 2016 - 2:12pm
DRAWN BY: H:\MCALLEN\NOLANA CONST-IMPROVEMENTS\Mc ANA TO RR TRACKS\Cad Files\Working\NAME2 IR8 (50 dpi).dwg

LAYOUT NAME: IR8
DATE: MAY 09, 2018 - 2:15PM
LAST SAVED: MAY 09, 2018 - 2:15PM
DRAWING FILE: H:\BICENTENNIAL\2017-BICENTENNIAL NOLANA TO RR TRACKS\CAD FILES\IRRIGATION\IR7,IR8,IR9,IR10.DWG



CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT NOLANA AVE TO RR TRACKS

SPRAY IRRIGATION IMPROVEMENTS STA. 12+00 TO STA. 22+00

CSJ NO.
DATE: 01/06/16
SURVEYED BY:
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO. 00-0000

SHEET NO. IR8
SCALE: HOR: 1" = 40'
REVISIONS:
1.
2.
3.
4.
SEAL:

GRAPHIC SCALE
0 20' 40'
1 INCH = 40' FT

MATCH LINE STA. 22+00.00

9 42.6 2"
10 42.5 2"
11 41.6 2"
12 41.6 2"

3/4" 3/4" 1" 1 1/4" 4" 1 1/2" 3/4" 1 1/2" 1 1/4"
1" 1 1/4" 1 1/2" 2" 2" 1 1/2" 1 1/4" 1"

EXISTING SLEEVE

ALLEY

San MH
Rim=118.14'
8" N FL=113.34
8" S FL=113.39
8" E FL=113.32'

Tel Ped

EXISTING SLEEVE

ALLEY

MATCH LINE STA. 27+00.00

MATCH LINE STA. 27+00.00

13 42.6 2"
14 42.5 2"

1 1/4" 15"RCP 1" 4" WV 3/4" 3/4" 1" 1 1/4" 1 1/2" 2" 2"
3/4" 3/4" WV 1" 1 1/4" 1 1/2" 2" 2" 1 1/4" 1 1/2"

Tel Ped

EXISTING SLEEVE

ALLEY

San MH
Rim=117.98
8" N FL=113.41
(Full of Dirt)

Rim=
8" N FL=
8" S FL=
8" E FL=

MATCH LINE STA. 32+00.00

LEGEND	
D	DRIP VALVE
S	SPRAY VALVE
B	BUBBLER VALVE

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

SPRAY IRRIGATION IMPROVEMENTS
STA. 22+00 TO STA. 32.00

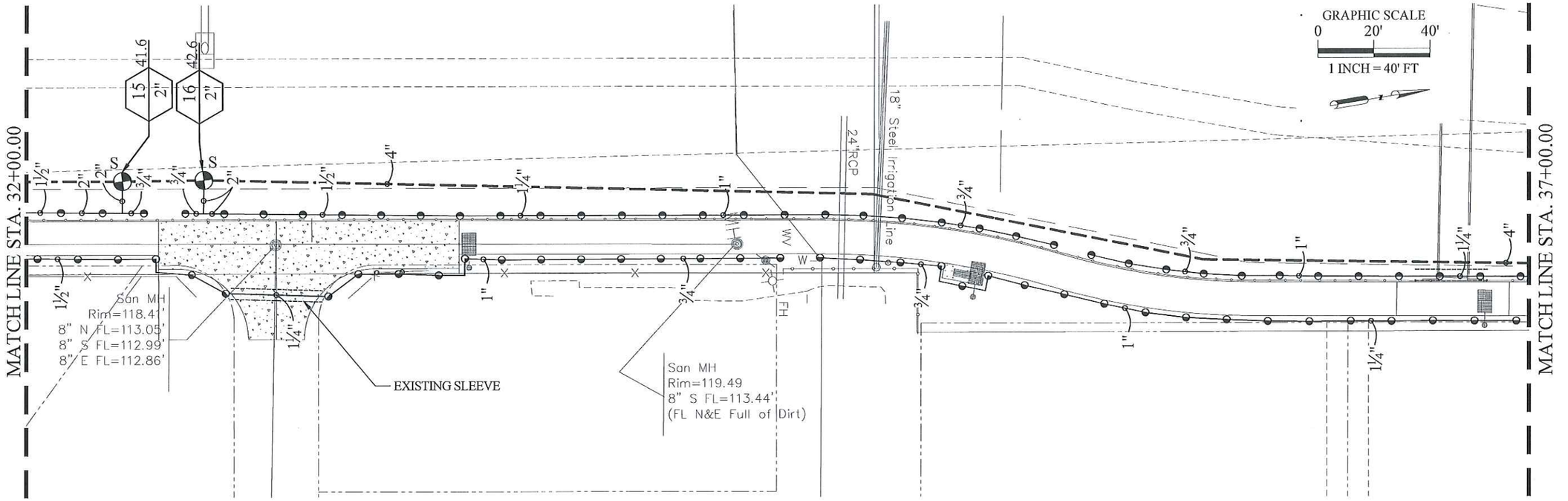
CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

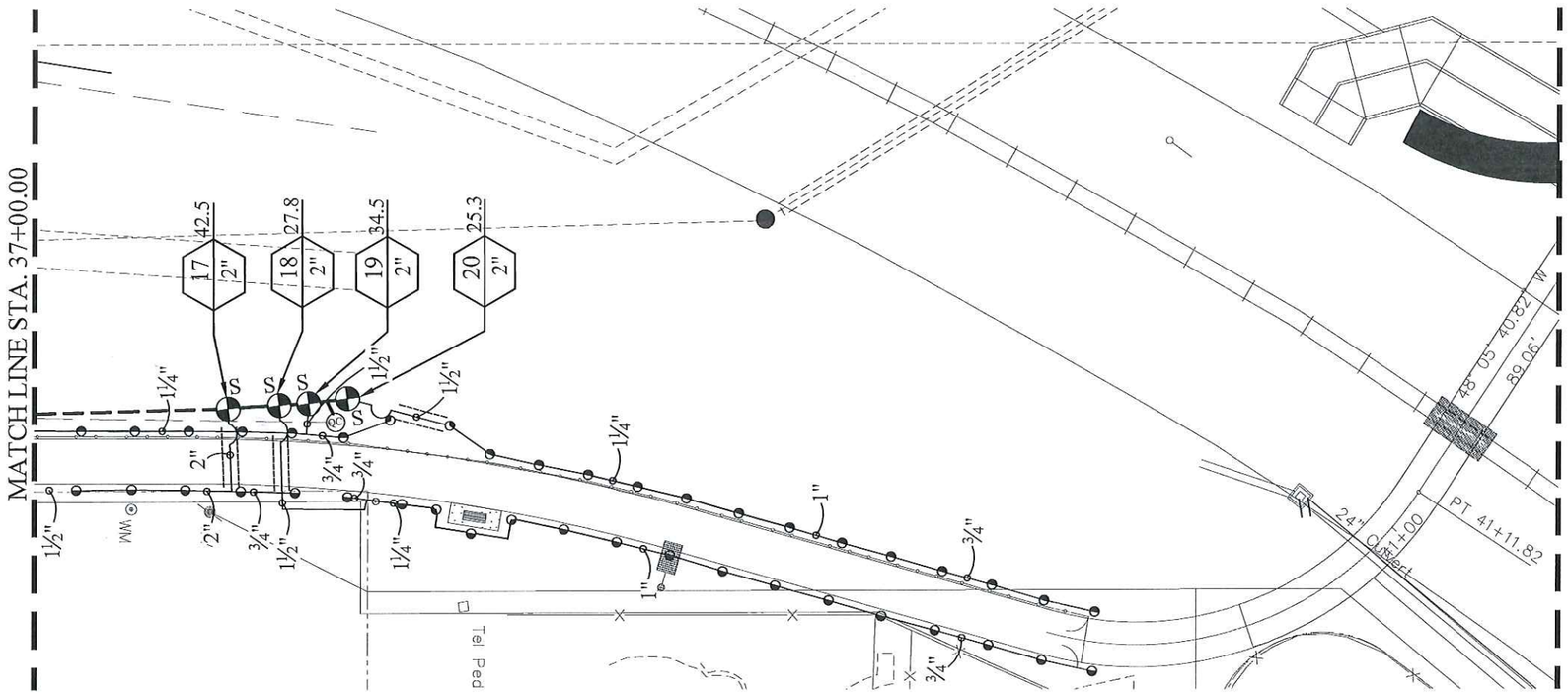
SCALE: HOR: 1" = 40'
REVISIONS:
1.
2.
3.
4.
SEAL:

STATE OF TEXAS
JOSE L. DE LA PAZ
8834
LICENSED IRRIGATOR

SHEET NO.:
IR9

LAYOUT NAME: IR9
DATE: Aug 08, 2016 - 1:07PM
LAST MODIFIED: Aug 08, 2016 - 1:05PM
DRAWING FILE: H:\BICENTENNIAL\2017-BICENTENNIAL NOLANA TO RR TRACKS\CAD FILES\IRRIGATION\IR7,IR8,IR9,IR10.DWG





LEGEND	
D	DRIP VALVE
S	SPRAY VALVE
B	BUBBLER VALVE

CSJ NO:

DATE: 01/06/16

SURVEYED BY: 00

DESIGNED BY: 00

DRAWN BY: 00

CHECKED BY: 00

PROJECT NO: 00-0000

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT NOLANA AVE TO RR TRACKS

SPRAY IRRIGATION IMPROVEMENTS 32+00 TO STA. 40+00

CITY OF McALLEN

PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" = 40'

REVISIONS:
1.
2.
3.
4.

SEAL:

STATE OF TEXAS
JOSE L. LA PAZ
8834
LICENSED LANDSCAPE ARCHITECT
7-12-16

SHEET NO: IR10

LAYOUT NAME: IR10
DATE: May 09, 2016 - 6:28PM
LAST SAVED: May 09, 2016 - 2:27PM
DRAWING FILE: I:\MISC\PARKS\NOLANA\CONSTRUCTION\NOLANA TO RR TRACKS\Civil Files\IRIGATION\IR7,IR8,IR9,IR10.dwg

NOTES

1. ALL IRRIGATION WORK TO BE PERFORMED BY A TEXAS LICENSED IRRIGATOR.
2. INSTALL ALL VALVES IN AN ARMOR VALVE BOX WITH COVER OR EQUAL. VALVE SHOULD BE CENTERED IN BOX TO FACILITATE ACCESS TO SOLENOID ASSEMBLY AND MANUAL OPERATORS.
3. PIPE AS SHOWN IS DIAGRAMMATIC BUT SHOULD BE REASONABLY FOLLOWED. LOCATION OF SPRINKLER HEADS SHALL BE ESTABLISHED BY THE CONTRACTOR BUT DESIGN SPACING MAY NOT BE EXCEEDED WITHOUT AUTHORIZATION FROM THE OWNER.
4. ALLOW A MINIMUM OF 6" CLEARANCE FROM ANY STRUCTURE, INCLUDING SIDEWALKS, CURBS, BUILDINGS, ETC. WHEN INSTALLING SPRINKLER HEADS
5. ALL SLEEVES SHALL BE SCH. 40 PVC, SHALL EXTEND 12" BEYOND EDGE OF PAVEMENT OR STRUCTURE, SHALL BE PLACED 24" BELOW TOP OF PAVEMENT AND SHALL BE CAPPED WITH PVC CAPS. DO NOT PENETRATE STRUCTURES WITHOUT PRIOR APPROVAL. LOCATION OF SLEEVES TO BE MARKED IN PAVEMENT WITH AN "S" CONCRETE STAMP.
6. AFTER INSTALLATION, SYSTEM MUST BE BALANCED BY ADJUSTING PRESSURE REGULATOR CONTROLS ON VALVES.
7. SYSTEM SHALL REQUIRE A MINIMUM OF 90 LBS. STATIC PRESSURE FOR SYSTEM TO OPERATE PROPERLY. IRRIGATION CONTRACTOR SHALL NOTIFY THE OWNER OF PRESSURE DEFICIENCIES OR IF THE PRIMARY WATER SUPPLY LINES ARE SMALLER THAN 4" AND/OR LONGER THAN 120' FROM THE SOURCE. NOTIFY THE OWNER OF ANY OTHER SITE PROBLEMS THAT MAY ALTER THE EFFECTIVENESS OF THE SYSTEM.
8. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE SPECIFICATIONS FOR THE LANDSCAPE IRRIGATION SYSTEM.
9. THE CONTRACTOR SHALL PREPARE "AS-BUILT" DRAWINGS IN AN AUTOCAD FORMAT WHICH SHALL SHOW LOCATIONS OF MAIN LINES, VALVES, CONTROLLERS AND SLEEVES. THE AUTOCAD DRAWINGS SHALL BE DELIVERED ON DISC TO THE OWNERS REPRESENTATIVE FOR REVIEW AND APPROVAL.
10. ALL SPLICES ARE TO BE CAPPED WITH TAN KING LOW VOLTAGE CONNECTORS OR EQUAL. NO FIELD SPLICES WILL BE PERMITTED. WHERE SPLICES ARE NECESSARY ALL MUST BE IN VALVE BOXES.
11. NO PIPE CROSSES ARE PERMITTED.
12. HAND DIG TRENCHES WITHIN THE DRIP LINE OF EXISTING TREES.
13. ALL MAIN & LATERAL LINES SHALL BE SET AT A MINIMUM DEPTH OF 18" TO THE TOP OF THE PIPE. ALL LATERAL LINES SHALL BE SET AT A MINIMUM DEPTH OF 18" TO THE TOP OF THE PIPE. ALL ELECTRIC VALVES SHALL BE SET TO A DEPTH OF 18" TO THE TOP OF ADJACENT PIPE.
14. ALL PIPING TO BE LAID WITH LETTERING UP.
15. ALL 3/4" - 2" LATERAL PIPING SHALL BE CLASS 200 SOLVENT WELD PVC.
16. PROVIDE THRUST BLOCKS AS PER DETAILS . ALL THRUST BLOCKING SHALL BE INSPECTED AND APPROVED BY THE OWNER PRIOR TO BACKFILL.
17. ALL VALVE WIRING SHALL BE #14 UF.
18. PROVIDE PRESSURE GAUGE ON INLET AND OUTLET.
19. PROVIDE QUICK COUPLERS AS INDICATED.
20. ALL PIPES GOING TO AND FROM RP AND PUMP SHALL BE SCH. 80 PVC PIPE. WRAP PIPE WITH 1/8"x2" INSULATION TAPE #4217-W3 BY NU-CALGON WHOLESALE INC. ST. LOUIS, MO. 63146.
21. ALL SPRINKLER HEADS SHALL BE SET LEVEL TO FINISH GRADES, PLACED VERTICAL IN THE GROUND, ADJUSTED TO COVER HEAD TO HEAD WITH MINIMAL SPRAY IN AREAS NOT IRRIGATED.
22. TEN (10) DAYS PRIOR TO START OF CONSTRUCTION THE CONTRACTOR SHALL VERIFY THE WATER STATIC PRESSURE. CONFIRM WITH OWNER THE WATER STATIC PRESSURE BEFORE COMMENCING WORK.
23. THE CONTRACTOR SHALL PROVIDE TWO QUICK COUPLER KEYS TO MATCH QUICK COUPLER SPECIFIED.
24. THE CONTRACTOR SHALL OBTAIN THE PROPER PERMIT FOR IRRIGATION WORK FROM THE CITY OF McALLEN PRIOR TO COMMENCING WORK.

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT NOLANA AVE TO RR TRACKS

IRRIGATION NOTES

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

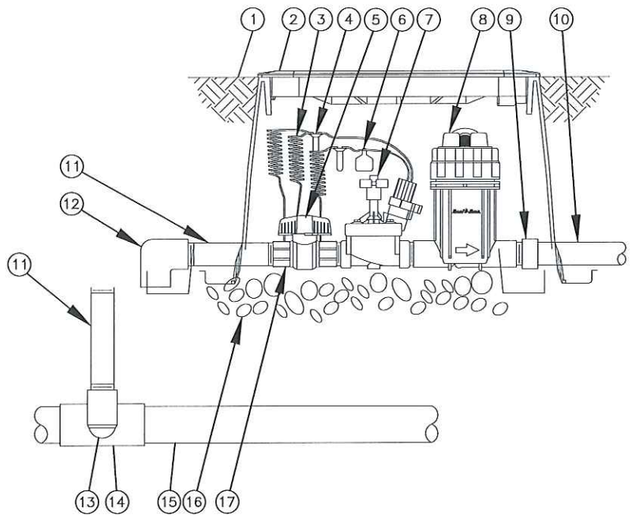
SCALE: HOR: 1" = N.T.S

REVISIONS:
1.
2.
3.
4.

SEAL:
STATE OF TEXAS
JOSE L. DE LA PAZ
8834
LICENSED LANDSCAPE ARCHITECT
7-12-16

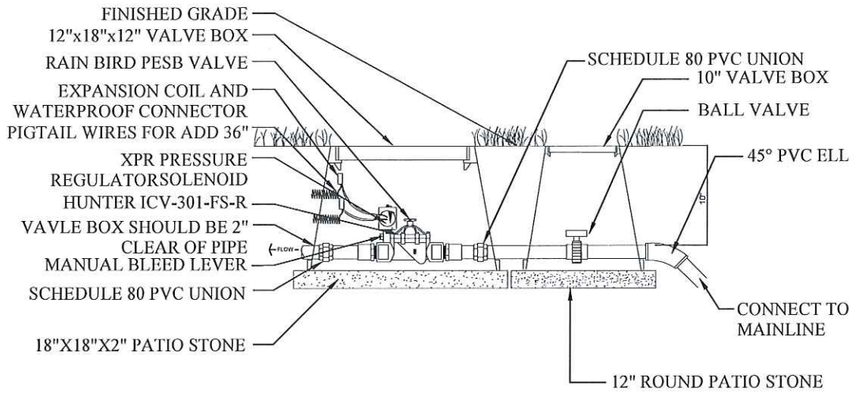
SHEET NO: IR11

LAYOUT NAME: IR11
DATE: May 09, 2016 - 2:44pm
LAST SAVED: May 09, 2016 - 2:43pm
DRAWING FILE: H:\ENGINEERING\MCALLEN TO RR TRACKS\CAD FILES\BICENTENNIAL NOLANA TO RR TRACKS\CAD\IR\IR11.DWG



1. FINISH GRADE/TOP OF MULCH
2. VALVE BOX WITH COVER: RAIN BIRD VB-STD
3. 30-INCH LINEAR LENGTH OF WIRE, COILED
4. WATERPROOF CONNECTION: RAIN BIRD DB SERIES
5. 1-INCH BALL VALVE (INCLUDED IN XCZ-PRB-100-COM KIT)
6. ID TAG
7. REMOTE CONTROL VALVE: RAIN BIRD PESB (INCLUCED IN XCZ-PRB-100-COM KIT)
8. PRESSURE REGULATING QUICK CHECK BASKET FILTER: RAIN BIRD PRB-QKCHK-100 (INCLUDED IN XCZ-PRB-100-COM KIT)
9. PVC SCH 40 FEMALE ADAPTOR
10. LATERAL PIPE
11. PVC SCH 80 NIPPLE (LENGTH AS REQUIRED)
12. PVC SCH 40 ELL
13. PVC SCH 80 NIPPLE (2-INCH LENGTH, HIDDEN) AND PVC SCH 40 ELL
14. PVC SCH 40 TEE OR ELL
15. MAINLINE PIPE
16. 3-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL
17. PVC SCH 80 NIPPLE, CLOSE (INCLUDED IN XCZ-PRB-100-COM KIT)

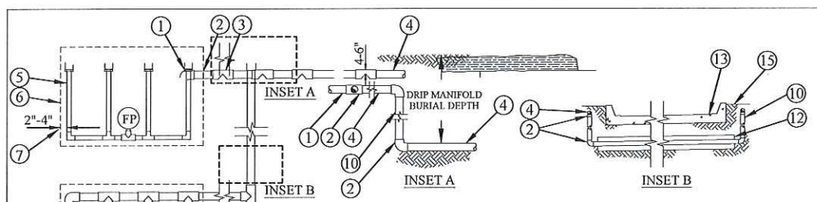
A XCZ-PRB-100-COM 1" COMMERCIAL CONTROL ZONE KIT IN SQUARE VALVE BOX
OPTION 1 N.T.S.



NOTES:

1. MAINTAIN A 2"-3" GAP BETWEEN THE BOTTOM OF THE VALVE AND THE TOP OF THE PATIO STONE.
2. PROVIDE 36" OF SLACK FOR CONTROL WIRES AND NEATLY COIL.
3. PROVIDE ONE EXTRA 14 GA. RED WIRE AT EACH VALVE FOR FUTURE USE.

B CITY OF MCALLEN VALVE LAYOUT WITH BALL VALVE N.T.S.

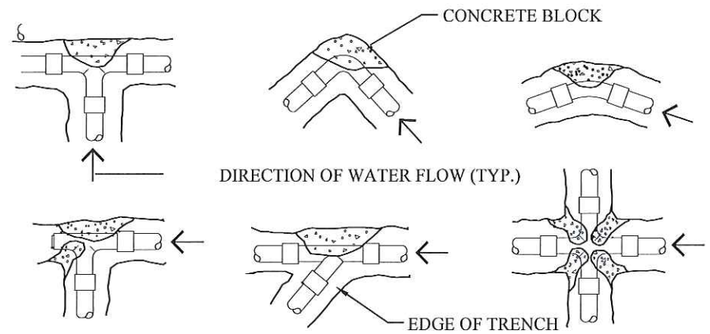


XFS Dripline Maximum Lateral Lengths (Feet)						
Inlet Pressure psi	12" Spacing		18" Spacing		24" Spacing	
	Nominal Flow (gph)		Nominal Flow (gph)		Nominal Flow (gph)	
	0.6	0.9	0.6	0.9	0.6	0.9
15	273	155	314	250	424	322
20	318	169	353	294	508	368
30	360	230	413	350	586	414
40	395	255	465	402	652	474
50	417	285	528	420	720	488
60	460	290	596	455	780	514

NOTES:
1. DISTANCE BETWEEN LATERAL ROWS AND EMITTER SPACING TO BE BASED ON SOIL TYPE, PLANT MATERIALS AND CHANGES IN ELEVATION. SEE INSTALLATION SPECIFICATIONS ON RAIN BIRD WEB SITE (WWW.RAINBIRD.COM) FOR SUGGESTED SPACING.
2. LENGTH OF LONGEST DRIPLINE LATERAL SHOULD NOT EXCEED THE MAXIMUM SPACING SHOWN IN THE ACCOMPANYING TABLE.
3. INSTALL AIR RELIEF VALVE AT HIGH POINTS IN DRIP LATERAL.
4. WHEN USING 17MM INSERT FITTINGS WITH DESIGN PRESSURE OVER 50PSI, IT IS RECOMMENMDED THAT STAINLESS STEEL CLAMPS BE INSTALLED ON EACH FITTING.
5. DRIP SHALL BE PLACED UNDER LANDSCAPE FABRIC IN LANDSCAPE BEDS WITH DECOMPOSED GRANITE.

C XFS SUB-SURFACE DRIPLINE WITH COOPER SHIELD
TYPICAL ISLAND LAYOUT N.T.S.

1. PVC SUPPLY HEADER
2. PVC SCH 40 TEE OR EL (TYPICAL)
3. BARB X MALE FITTING: RAIN BIRD XFF-MA FITTING (TYPICAL)
4. PVC DRIP MANIFOLD FROM RAIN BIRD CONTROL ZONE VALVE KIT (SIZED TO MEET LATERAL FLOW DEMAND)
5. SUB-SURFACE DRIPLINE: RAIN BIRD XF SERIES DRIPLINE (TYPICAL) POTABLE: XFS DRIPLINE NON-POTABLE: XFSP DRIPLINE
6. PERIMETER OF AREA
7. PERIMETER DRIPLINE PIPE TO BE INSTALLED 2"-4" FROM PERIMETER OF AREA
8. FLUSH POINT (TYPICAL) - SEE RAIN BIRD XFS DETAILS FOR FLUSH POINT INSTALLATION
9. BARB X BARB INSERT TEE OR EL: RAIN BIRD XFF-TEE OR RAIN BIRD XFF-ELBOW (TYPICAL)
10. PVC RISER PIPE
11. PVC SUPPLY MANIFOLD
12. PVC SCH 40 SLEEVE PIPE SIZED TWICE THE SIZE OF MANIFOLD PIPE SIZE
13. PAVEMENT AND CURB
14. TURF OR MULCH
15. FINISH GRADE
16. ½" AIR RELIEF VALVE: RAIN BIRD MODEL: RV050
SEE RAIN BIRD XFS DETAILS FOR AIR RELIEF INSTALLATION



THRUST BLOCK REQUIREMENTS VS. FITTING TYPE				
PIPE SIZE	1 1/4" - 2 1/2"	3"	4"	6"
TEES/ELLS	1.00	1.00	1.40	3.2
90° BEND	1.00	1.25	2.00	4.5
45° BEND	1.00	1.00	1.00	2.4

NOTES:
1. THRUST BLOCKING TO BE PLACED AT ALL DEAD ENDS, TEES, BENDS, WYES AND REDUCERS AND ANY OTHER AREA AS DETERMINED BY THE ENGINEER/ARCHITECT.
2. MINIMUM AREAS SHOWN ARE IN SQUARE FEET.
3. BEARING MUST BE ON UNDISTURBED EARTH.
4. THRUST BLOCK SHALL BEAR ON FULL 180° OF PIPE CIRCUMFERENCE.
5. USE A MINIMUM OF ONE (1) CU. FT OF 3000 PSI CONCRETE.

D THRUST BLOCKS
N.T.S.

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT NOLANA AVE TO RR TRACKS

IRRIGATION DETAILS

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" = N.T.S

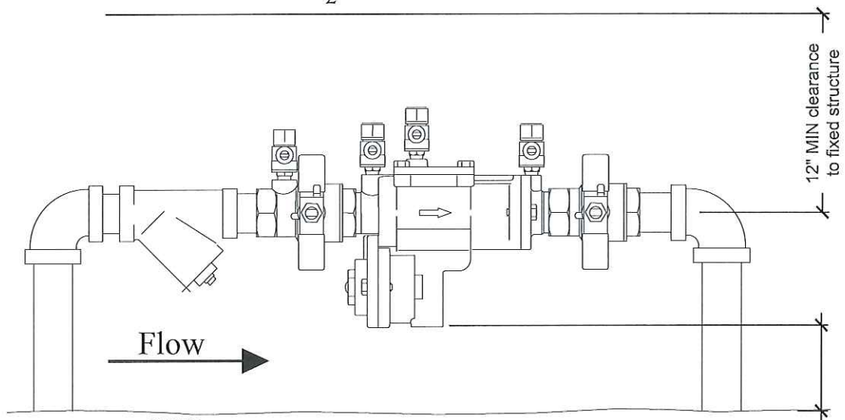
REVISIONS:
1.
2.
3.
4.

SEAL:
STATE OF TEXAS
JOSE L DE LA PAZ
8834
LICENSED IRRIGATOR
9-7-12-18

SHEET NO: IR12

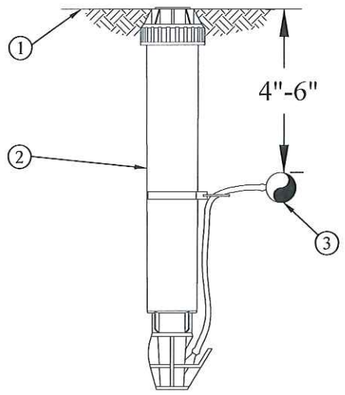
LAYOUT NAME: IR12
DATE: MAY 09, 2018 - 5:20PM
LAST SAVED: MAY 09, 2018 - 3:18PM
PLOTTED BY: ESTEBAN PONCE ALVAREZ-HERNANDEZ

Series LF860 $\frac{1}{2}$" - 2" Outdoor Installation



NOTES:
1. INSTALL PVB 12" ABOVE THE HIGHEST DOWNSTREAM OUTLET AND THE HIGHEST POINT IN THE DOWNSTREAM PIPING.
2. CENTER PVB ON 4" CONCRETE PAD. VERIFY CONCRETE FORMS WITH OWNER PRIOR TO POUR.

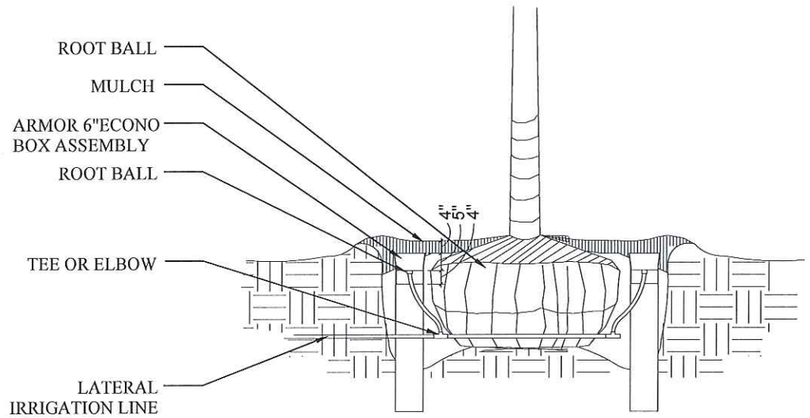
E FEBCO LF860 Series Backflow or Equal Approved
N.T.S.



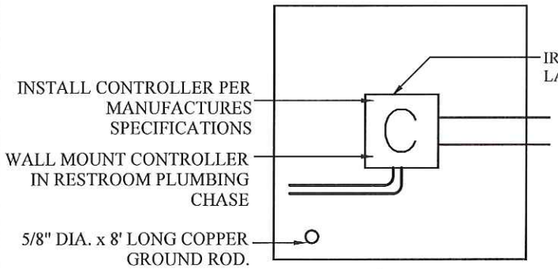
1. FINISH GRADE/TURF
2. OPERATION INDICATOR RAIN BIRD MODEL: OPERIND
3. SUB-SURFACE DRIPLINE: RAIN BIRD XF SERIES DRIPLINE POTABLE: XFS DRIPLINE NON-POTABLE: XFSP DRIPLINE

NOTE:
1. INSERT BARB TRANSFER FITTING DIRECTLY INTO DRIPLINE TUBING.
2. VAN NOZZLE MAY BE SET TO CLOSED, OR IF IT IS DESIRED TO SEE SPRAY FROM THE NOZZLE, SET THE ARC TO ¼ PATTERN. THE FLOW FROM THE NOZZLE, 0.3 GPM, SHOULD BE ACCOUNTED FOR IN THE SYSTEM DESIGN.

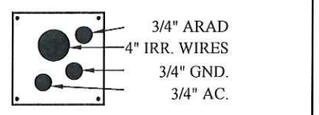
F XFS SUB-SURFACE DRIPLINE
OPERATION INDICATOR NTS



G Rain Bird RWS-M-B-C MINI ROOT WATERING SYSTEM
1402 0.5 GPM N.T.S.



IRRIGATION CONTROLLER DETAILED LAYOUT



NOTES:
1. THIS DRAWING IS DIAGRAMMATIC.
2. VERIFY CONCRETE FORMS WITH OWNER PRIOR TO POURING.
3. COORDINATE ELECTRICAL SUPPLY AND HOOK-UP WITH OWNER.
4. CONTROLLER PROVIDED BY OWNER.

H IRRINET-M
MOTOROLA CONTROLLER N.T.S.

CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT NOLANA AVE TO RR TRACKS

IRRIGATION DETAILS

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

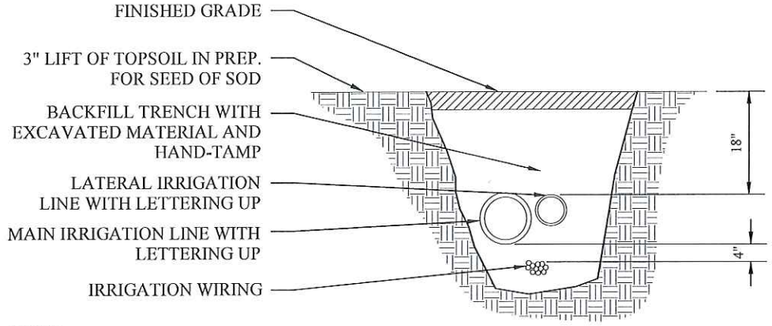
SCALE: HOR: 1" = N.T.S

REVISIONS:
1.
2.
3.
4.

SEAL: STATE OF TEXAS · JOSE L DE LA PAZ · 8834 · LICENSED LANDSCAPE ARCHITECT
7-12-18

SHEET NO: IR13

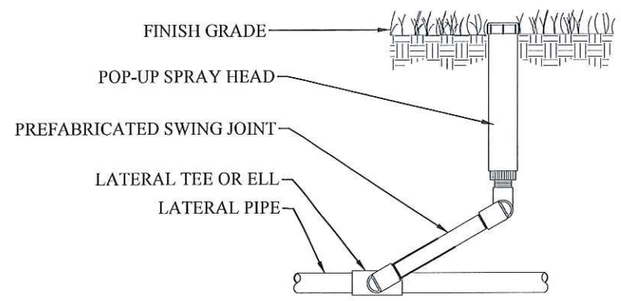
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DATE: May 08, 2018 - 3:59pm
LAST SAVED: May 08, 2018 - 3:58pm
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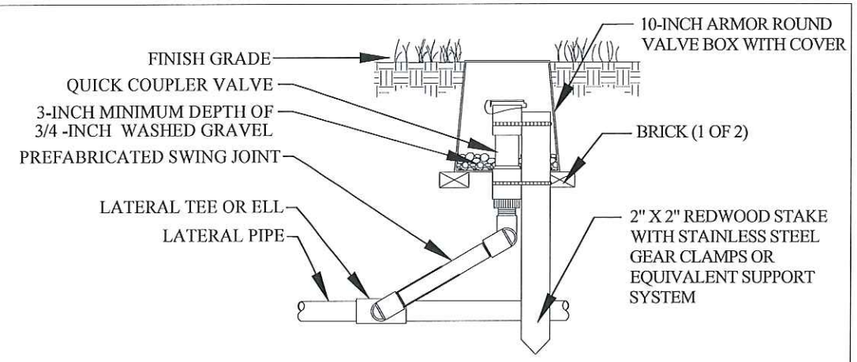
NOTE:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE FINISHED GRADE IS FLUSH.
2. CONTRACTOR IS TO ENSURE ALL PIPING IS TO BE LAID WITH LETTERING UP.

I IRRIGATION PIPE LAYOUT
BACKFLOW MAIN LINE, LATERAL, WIRES N.T.S.



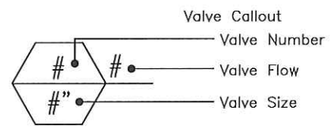
J XFS SUB-SURFACE DRIPLINE
OPERATION INDICATOR N.T.S.



K QUICK COUPLER
RAIN BIRD 44RC - 1" N.T.S.

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
Q T H TQ F	Rain Bird 1804-SAM-PRS 15 Series MPR Turf Spray 6.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. 1/2" NPT Female Threaded Inlet. With Seal-A-Matic Check Valve. Pressure Regulating or approved equal.	472	30
1401 1402	Rain Bird RWS-M-B-C Mini Root Watering System with 4.0" diameter x 18.0" long with locking grate, semi-rigid mesh tube and Rain Bird 1401 0.25 gpm or 1402 0.5 gpm bubbler as indicated. With Check Valve or approved equal.	94	30
	Area to Receive Dripline Rain Bird XFS-09-12 (12) XFS Sub-Surface Pressure Compensating Landscape Dripline w/Copper Shield Technology. 0.9GPH emitters at 12.0" O.C. Dripline laterals spaced at 12.0" apart, with emitters offset for triangular pattern. UV Resistant.	2,747	
	Rain Bird PESB-PRS-D 2" 1", 1-1/2", 2" Plastic Industrial Valves. Low Flow Operating Capability, Globe Configuration. With Pressure Regulating Module, and Scrubber Technology for Reliable Performance in Dirty Water Irrigation Applications or approved equal.	24	
	Shut Off Valve	1	
BF	Febco 765 2" Lead Free Pressure Vacuum Breaker, brass with ball valve SOV. Install 12" (305MM) above highest downstream outlet and the highest point in the downstream piping or approved equal.	1	
M	Water Meter 2"	1	
	Irrigation Lateral Line: PVC Class 200 SDR 21 3/4" PVC Class 200 irrigation pipe.	1,242 LF	
	Irrigation Lateral Line: PVC Class 200 SDR 21 1" PVC Class 200 irrigation pipe.	2,235 LF	
	Irrigation Lateral Line: PVC Class 200 SDR 21 1-1/4" PVC Class 200 irrigation pipe.	2,386 LF	
	Irrigation Lateral Line: PVC Class 200 SDR 21 1-1/2" PVC Class 200 irrigation pipe.	2,165 LF	
	Irrigation Lateral Line: PVC Class 200 SDR 21 2" PVC Class 200 irrigation pipe.	2,338 LF	
	Irrigation Lateral Line: PVC Class 200 SDR 21 2-1/2" PVC Class 200 irrigation pipe.	260 LF	
	Irrigation Mainline: PVC Schedule 40 4" PVC Schedule 40 irrigation pipe.	2,905 LF	
	Pipe Sleeve: PVC Schedule 40	297 LF	
QC	Quick Coupler	2	



CSJ NO:
DATE: 01/06/16
SURVEYED BY: 00
DESIGNED BY: 00
DRAWN BY: 00
CHECKED BY: 00
PROJECT NO: 00-0000

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT NOLANA AVE TO RR TRACKS

IRRIGATION DETAILS

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

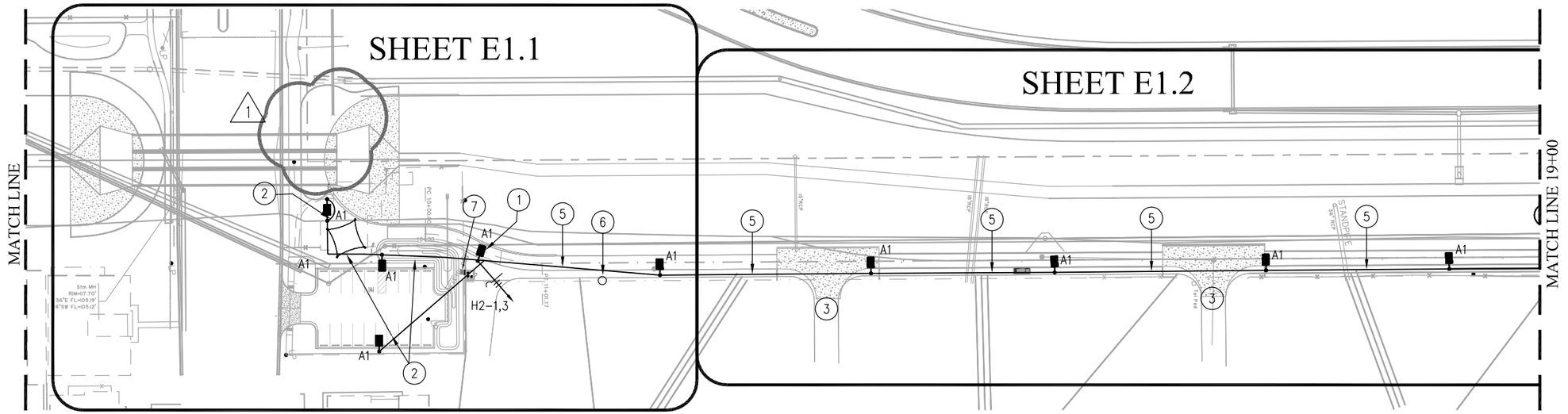
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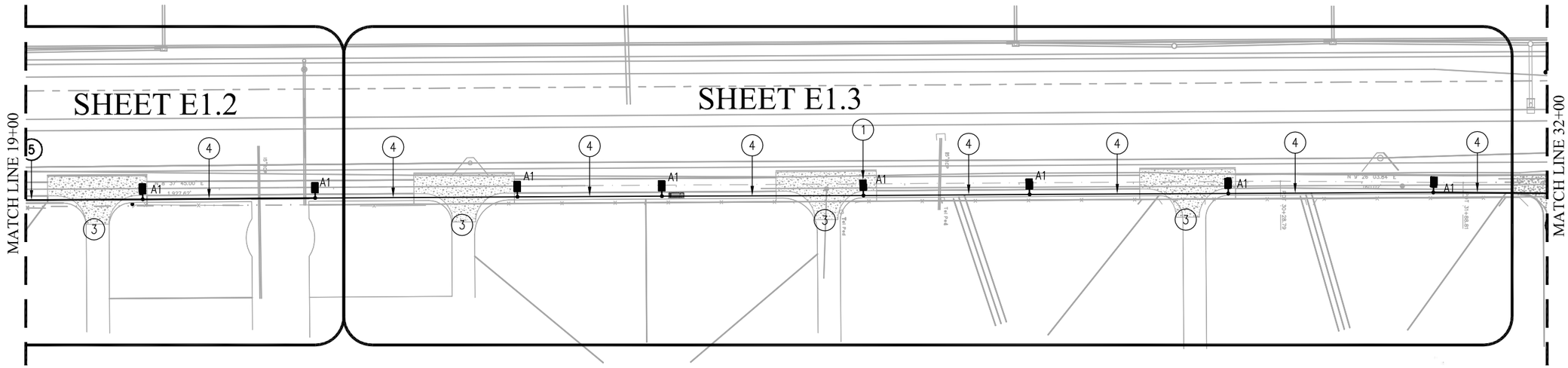
REVISIONS:
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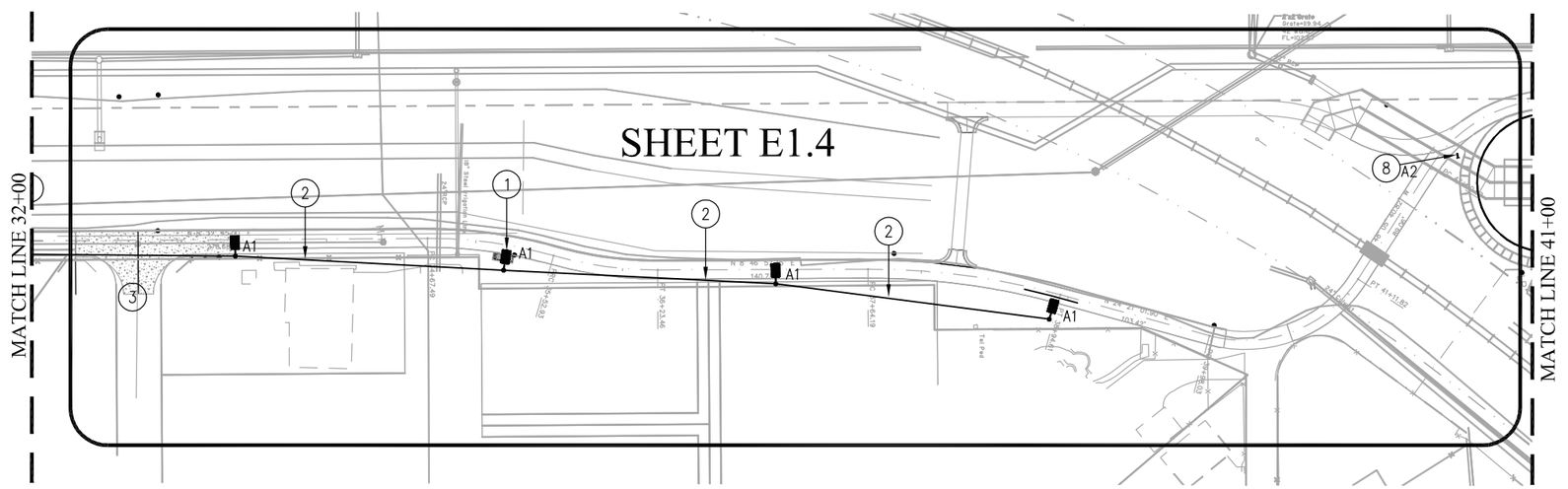
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SHEET NO.: IR14

LAYOUT NAME: IR14
DATE: MAY 09, 2018 - 5:16PM
LAST SAVED: MAY 09, 2018 - 5:12PM
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STATE OF TEXAS
EDWARD PUENTES
102338
LICENSED
PROFESSIONAL ENGINEER

08/17/2018

KEYPLAN

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956.683.1903 f

DBR Project Number 12801.000

E.P.	—	—	D.C.

CSJ NO:	0921-06-243
DATE:	07/31/15
SURVEYED BY:	DBR
DESIGNED BY:	DBR
DRAWN BY:	DBR
CHECKED BY:	DBR
PROJECT NO:	12801.001

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

OVERALL ELECTRICAL SITE PLAN

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

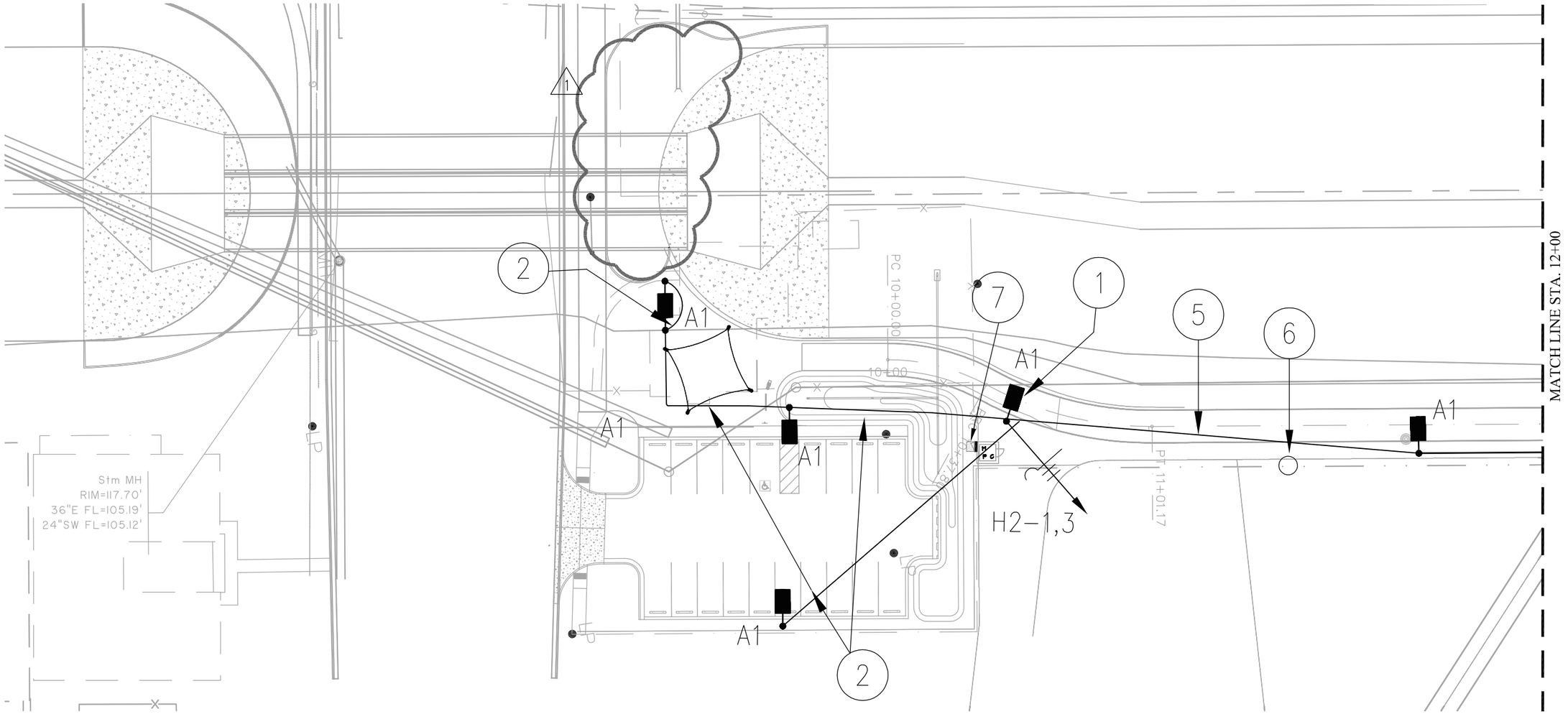
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REVISIONS:
1. 08/17/2018
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DATE: Aug 17, 2018 - 11:56am
LAST SAVED: Aug 10, 2015 - 3:10pm
DRAWING FILE: C:\12\12801.001\Drawings\DE-12801-E1.0-EE-ELEC SITE(2).dwg



1 ELECTRICAL SITE PLAN

E1.1

SCALE: 1" = 40'-0"

SITE GENERAL NOTE:

A. REFER TO SHEET E1.5 FOR SITE GENERAL NOTES & KEYED NOTES.

STATE OF TEXAS
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CSJ NO: 0921-06-243
DATE: 07/31/15
SURVEYED BY: DBR
DESIGNED BY: DBR
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NO: 12801.001

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

ENLARGED PLAN
NOLANA ST. TO STA. 12+00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

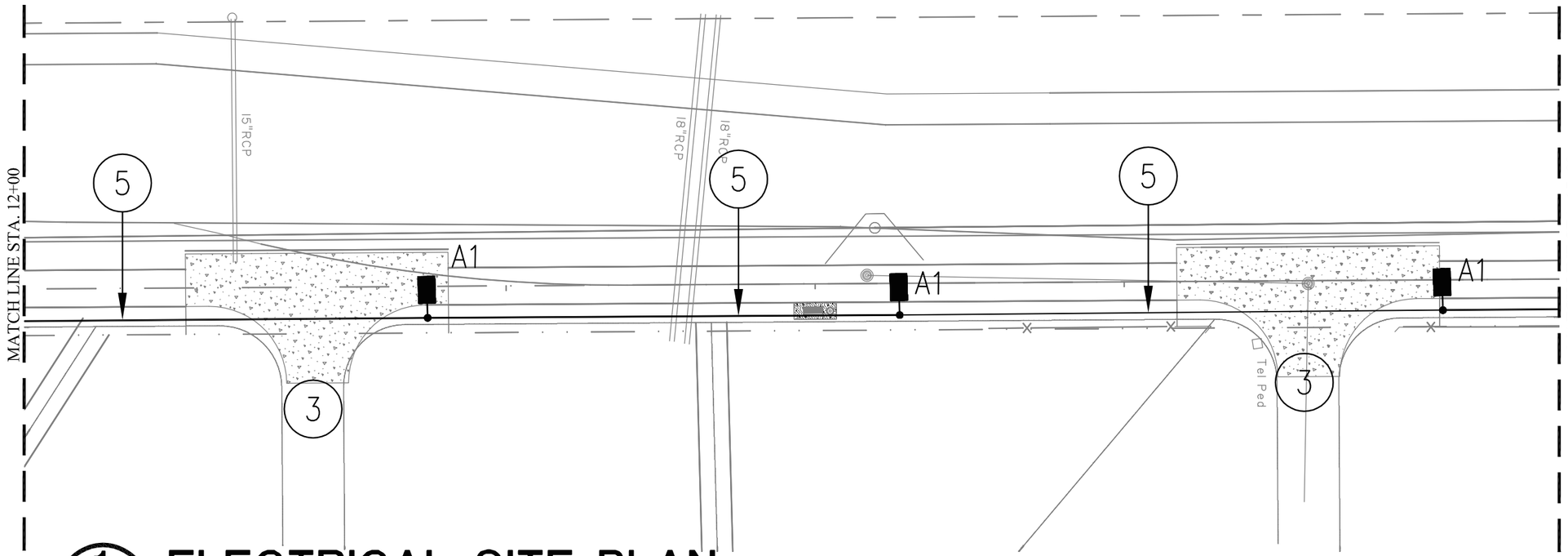
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SEAL:

SHEET NO: E1.1

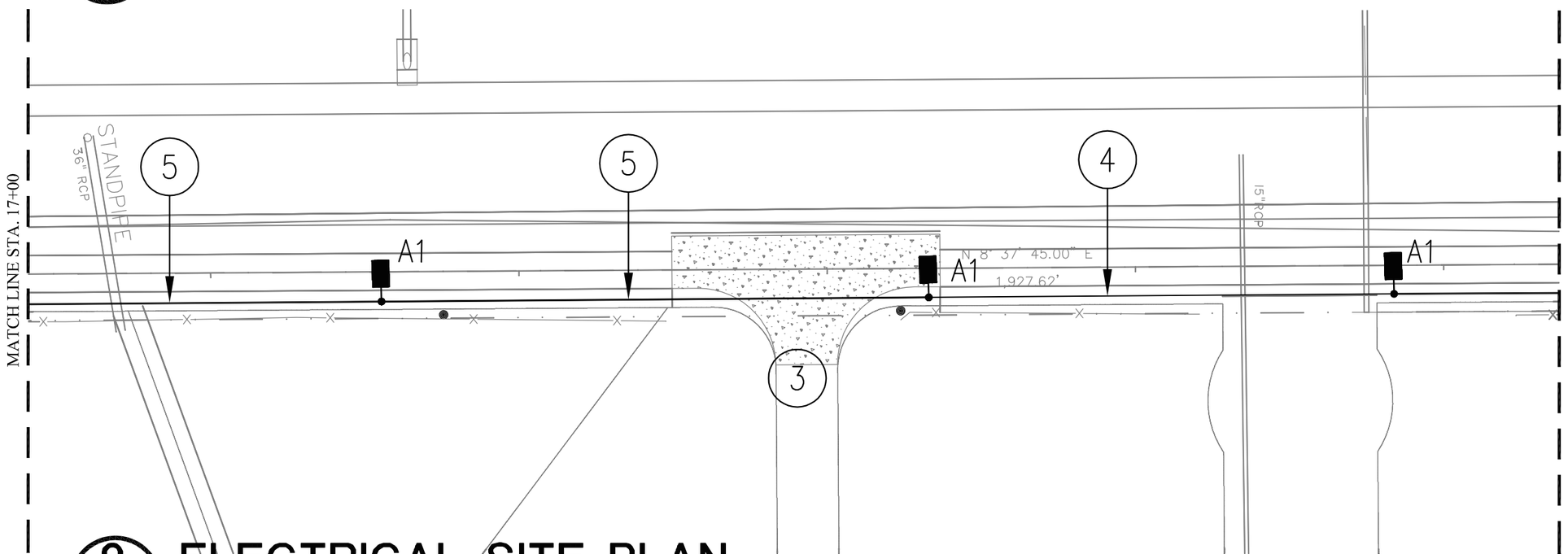
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1 ELECTRICAL SITE PLAN

E1.2

SCALE: 1" = 40'-0"



2 ELECTRICAL SITE PLAN

E1.2

SCALE: 1" = 40'-0"

SITE GENERAL NOTE:

A. REFER TO SHEET E1.5 FOR SITE GENERAL NOTES & KEYED NOTES.

STATE OF TEXAS
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DBR Project Number 12801.001

E.P.	--	--	D.C.

CSJ NO: 0921-06-243
DATE: 07/31/15
SURVEYED BY: DBR
DESIGNED BY: DBR
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NO: 12801.001

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

ENLARGED PLAN
STA. 12+00 TO STA. 22+00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

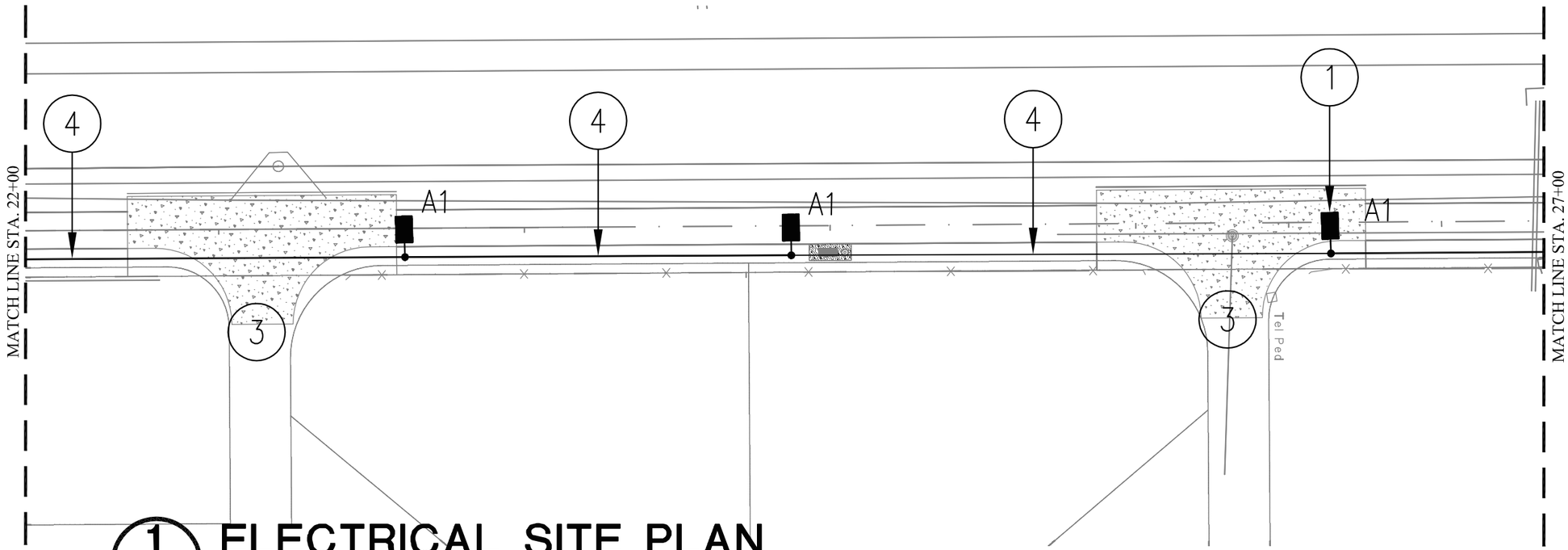
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REVISIONS:
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SEAL:

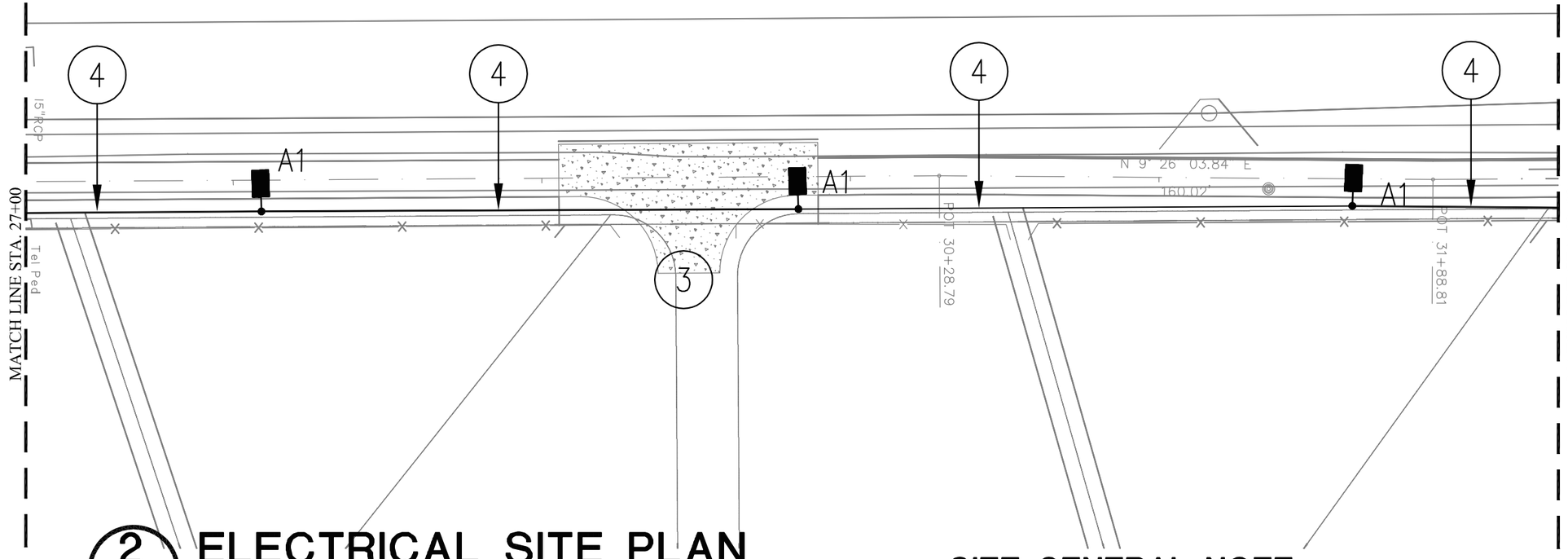
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1 E1.3 ELECTRICAL SITE PLAN

SCALE: 1" = 40'-0"



2 E1.3 ELECTRICAL SITE PLAN

SCALE: 1" = 40'-0"

SITE GENERAL NOTE:

A. REFER TO SHEET E1.5 FOR SITE GENERAL NOTES & KEYED NOTES.

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CSJ NO: 0921-06-243
DATE: 07/31/15
SURVEYED BY: DBR
DESIGNED BY: DBR
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NO: 12801.001

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

ENLARGED PLAN
STA. 22+00 TO STA. 32+00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

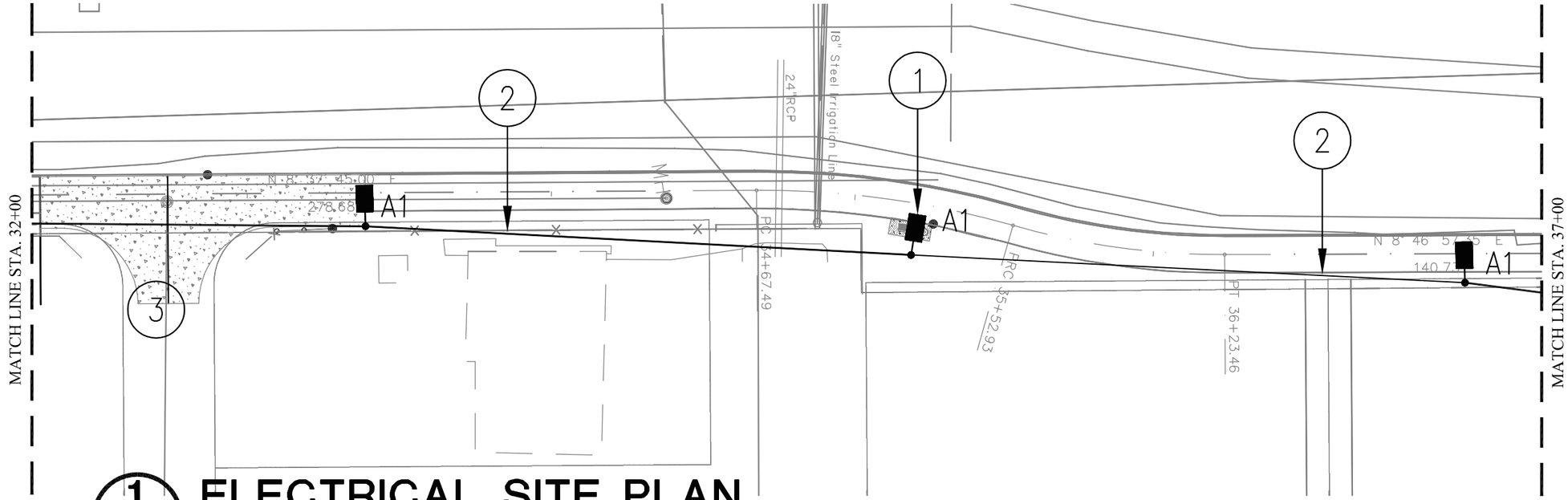
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REVISIONS:
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SEAL:

SHEET NO.: E1.3

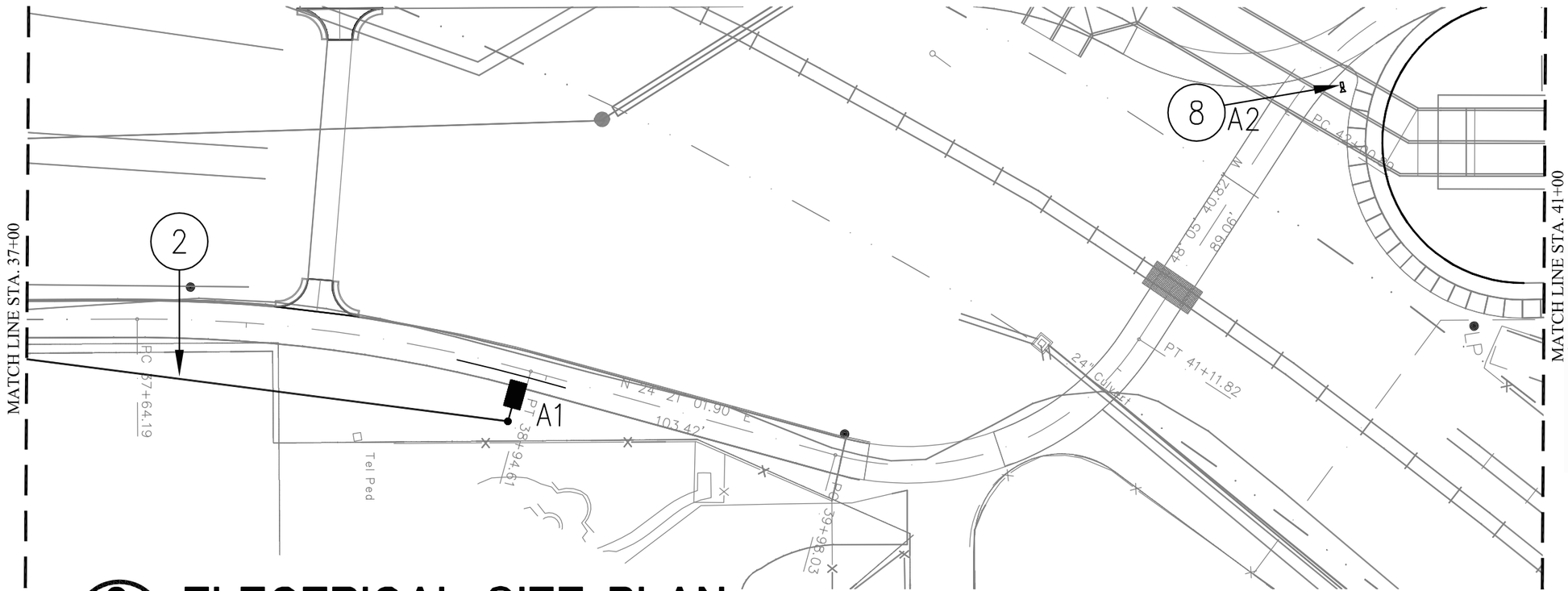
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1 ELECTRICAL SITE PLAN

E1.4

SCALE: 1" = 40'-0"



2 ELECTRICAL SITE PLAN

E1.4

SCALE: 1" = 40'-0"

SITE GENERAL NOTE:

A. REFER TO SHEET E1.5 FOR SITE GENERAL NOTES & KEYED NOTES.

STATE OF TEXAS
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07/31/2015

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E.P.	--	--	D.C.

CSJ NO: 0921-06-243
DATE: 07/31/15
SURVEYED BY: DBR
DESIGNED BY: DBR
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NO: 12801.001

PROJECT:
BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

ENLARGED PLAN
STA. 32+00 TO STA. 40+00

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE: HOR: 1" = 40'

REVISIONS:
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SEAL:

SHEET NO: E1.4

LAYOUT NAME: E1.4
DATE: Aug 06, 2015 - 4:32pm
LAST SAVED: Aug 06, 2015 - 4:22pm
DRAWING FILE: N:\12801.001\DRAWINGS\ELE\12801-ELE-ELEC SITE(2).DWG

SITE GENERAL NOTES:

A. MINIMUM CIRCUIT SIZE IS 2#12 AND 1#12 GROUND IN 3/4" CONDUIT. 20A/120V HOMERUNS EXCEEDING 200FT THE WIRE SIZE SHALL BE #10 & #8 FOR 275FT. MAXIMUM FIXTURE WHIP LENGTH FROM ANY J-BOX 6 FEET. LIGHTING CIRCUITS JOINTS SHALL BE MADE UP IN OVERHEAD J-BOXES SECURED TO STRUCTURE WITH LIGHTING WHIPS FROM THE J-BOXES. FIXTURES DESIGNED TO BE QUICK-CLIPPED TOGETHER SHALL BE CONNECTED AS PER MANUFACTURER.

B. ALL ELECTRICAL RECEPTACLES SHALL BE INSTALLED WITH THE GROUND OPENING IN THE "UP" POSITION.

C. ELECTRICAL CONTRACTOR SHALL GROUP HOMERUNS WITH THREE HOTS (A, B AND C PHASE), #10 NEUTRAL TO PROVIDE MULTI-WIRE BRANCH CIRCUITS. NO MORE THAN 2 MULTI-WIRE HOMERUNS PER CONDUIT.

D. BRANCH CIRCUITS SHALL NOT BE ROUTED IN SLAB EXCEPT AS SHOWN. SWITCHGEAR DISTRIBUTION, LIGHTING CLASS PANELBOARDS AND EQUIPMENT FEEDERS MAYBE IN SLAB. FEEDERS SHOWN DASHED LINES ARE ROUTED IN THE SLAB AND OVERHEAD FEEDERS ARE SHOWN IN CONTINUOUS LINE. REFER TO FLOOR PLANS AND SYMBOL LEGEND.

E. BORE UNDERNEATH EXISTING SIDEWALKS. CUT & PATCH EXISTING ASPHALT AS MINIMALLY AS POSSIBLE.

(#) SITE ELECTRICAL KEYED NOTES:

1. CONTRACTOR TO INSTALL NEW FIXTURES, POLES & ALL REQUIRED ACCESSORIES. CONTROL TO BE DONE THROUGH INDIVIDUAL FIXTURE INTEGRAL PHOTOCELLS. SEE DETAIL #2 ON SHEET E3.1 – TYPICAL.

2. 1" RACEWAY – 2#10 & 10G (POWER) & 1" SPARE RACEWAY – TYPICAL UNLESS NOTED OTHERWISE.

3. CONTRACTOR TO BORE 6" SLEEVE AT THIS APPROXIMATE LOCATION. COORDINATE EXACT LOCATION WITH OWNER.

4. 1" RACEWAY – 2#3 & #6G (POWER) & 1" SPARE RACEWAY.

5. 1.25" RACEWAY – 2#1 & #4G (POWER) & 1" SPARE RACEWAY.

6. NEW ELECTRIC UTILITY DIP POLE. COORDINATE EXACT LOCATION WITH A.E.P. SEE ELECTRICAL RISER DIAGRAM ON SHEET E2.0 FOR FURTHER INFORMATION. INCLUDE ALL UTILITY COMPANY FEES IN BASE BID.

7. APPROXIMATE LOCATION OF NEW PANEL "H2". PROVIDE UNISTRUT & RIGID GALVANIZED PIPE RACK AS PER ELECTRICAL RISER DIAGRAM ON SHEET E2.0. COORDINATE WITH OWNER FOR EXACT LOCATION PRIOR TO ROUGH-IN.

8. APPROXIMATE LOCATION FOR CAMERA POLE. COORDINATE EXACT LOCATION WITH OWNER PRIOR TO INSTALLATION. REFER TO PROJECT EQUIPMENT SCHEDULE SECOND LINE ITEM.

1

CSJ NO: 0921-06-243
DATE: 07/31/15
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DESIGNED BY: DBR
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NO: 12801.001

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT NOLANA AVE TO RR TRACKS

ELECTRICAL NOTES

STATE OF TEXAS
EDWARD PUENTES
102338
LICENSED
PROFESSIONAL ENGINEER

08/17/2018

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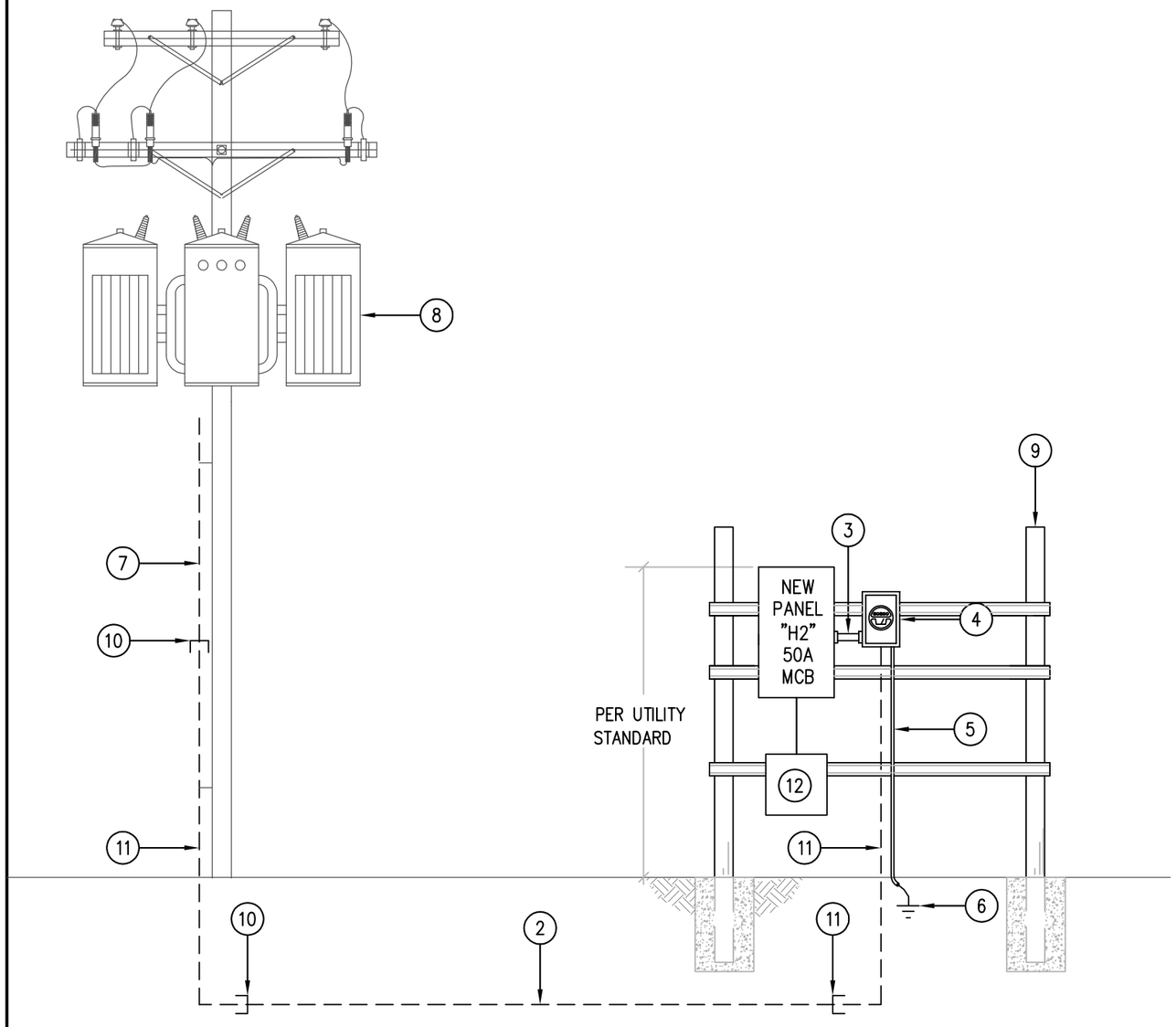
DBR Project Number 12801.000
E.P. | -- | -- | D.C.

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE:
REVISIONS:
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SEAL:

SHEET NO: E1.5

LAYOUT NAME: E1.5
DATE: Aug 17, 2018 - 11:59am
LAST SAVED: Aug 10, 2015 - 11:04am
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1 E2.0 ELECTRICAL RISER DIAGRAM

SCALE: NOT TO SCALE

ONE-LINE ELECTRICAL (#) DIAGRAM KEYED NOTES

1. 480/277V 3ø POLE MOUNTED TRANSFORMER BANK BY A.E.P.
2. NEW 4" UNDERGROUND SECONDARY P.V.C. POWER RACEWAY.
3. 1" RACEWAY – 4#6 & 8G.
4. COORDINATE METERING REQUIREMENT WITH ELEC. UTILITY COMPANY. INCLUDE ALL UTILITY COMPANY FEES IN BASE BID.
5. 3/4" RACEWAY – #6G.
6. 3/4" X 10' COPPER CLAD GROUND ROD.
7. NEW 4" DIP POLE. SEE SHEET ELECTRICAL SITE PLANS FOR LOCATION. SECONDARY CONDUCTORS FROM POLE MOUNTED TRANSFORMER TO NEW SERVICE LOCATION TO BE PROVIDED & INSTALLED BY ELECTRICAL UTILITY PROVIDER. INCLUDE ALL UTILITY COMPANY FEES IN BASE BID.
8. 480/277V 3ø POLE MOUNTED TRANSFORMER BANK BY A.E.P. INCLUDE ALL UTILITY COMPANY FEES IN BASE BID.
9. PROVIDE GALVANIZED UNISTRUT SUPPORT RACK WITH 3" RIGID GALVANIZED VERTICAL PIPES. BURY VERTICAL PIPES A MINIMUM OF 24" & SURROUND WITH CONCRETE.
10. PROVIDE RIGID GALVANIZED RACEWAY ELBOWS & UP TO 10' ABOVE GRADE.
11. TRANSITION TO P.V.C. CONDUIT VIA R.G.S. THREADED CONDUIT COUPLING.
12. CONTRACTOR TO FURNISH AND INSTALL SQUARE D | 5KVA MPZ5S40F WITH (4)–20A/1P BREAKERS. PRIMARY (3)#10 IN 3/4"C ;SECONDARY (3)#8+#8G. ONE 20A/1P CIRCUIT BREAKER SHALL BE USED TO FEED SECURITY CAMERA. ONE 20A/1P CIRCUIT BREAKER SHALL BE USED TO FEED IRRIGATION CONTROL.

STATE OF TEXAS
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CSJ NO: 0921-06-243
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CHECKED BY: DBR
PROJECT NO: 12801.001

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

ELECTRICAL RISER DIAGRAM

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE:

REVISIONS:
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SEAL:

SHEET NO.: E2.0

LAYOUT NAME: E2.0
DATE: Aug 06, 2015 - 4:33pm
LAST SAVED: Aug 06, 2015 - 4:22pm
DRAWING FILE: N:\12801.001\Working\VE-12801-EIS-EIS ELEC SITE(2).dwg

PROJECT EQUIPMENT SCHEDULE

TYPE	MANUF.	CATALOG NO.	MOUNTING	LAMPS #	LAMPS TYPE	VOLTAGE	INPUT WATTS	REMARKS	QUANTITIES	NOTES
A1	HOLOPHANE	FIXTURE: GVP 17P 48 M B 6 R S B C H P27 S64319 OSA 16 F5J 10 P07 ABG BK	POLE	1	175W, M.H.	480	190	AREA LUMINAIRE	FIXTURES: 21 POLES: 21	1

OTHER LIGHT FIXTURE MANUFACTURERS THAN THOSE LISTED ON THIS SCHEDULE ARE REQUIRED TO OBTAIN PRIOR APPROVAL BY SUBMITTING CUT SHEETS OF THEIR SUBSTITUTIONS AT LEAST (10) DAYS PRIOR TO BID DATE. AFTER REVIEW TO CONFIRM SUBMISSIONS TO BE EQUAL IS COMPLETED, APPROVAL OR DISAPPROVAL WILL BE GIVEN.

NOTES:

1. FURNISH U.L. LISTED FOR WET LOCATION.

1

Lighting Class Panelboard "H2"

10,000 AIC Rating
Existing
X New

277/480 Volt,3-Phase,4-Wire
1 Section
3R -Nema Rating

X MCB 50 AMP MCB
MLO 100 AMP BUS (Copper)
ISO. GRND. BUS

X Single
Double
Feed - Thru

Mounting
X Surface
Flush

Notes	Load (VA)	Description	Type	Wire	CB	CKT #	PH	CKT #	CB	Wire	Type	Description	Load (VA)	Notes
	3393	LIGHTING TRAIL	EL		20/2	1	A	2	20/2	10	EL	MPZ5	2400	
	3393		EL			3	B	4			EL		2400	
		PROVISION			20/2	5	C	6	20/2			PROVISION		
						7	A	8						
		PROVISION			20/2	9	B	10	20/2			PROVISION		
						11	C	12						
	6,786	Subtotal										Subtotal	4,800	

N.E.C. (2005)	Load Type	Conn.	Fct.	Diversity	N.E.C. (2005)		Conn.	Fct.	Diversity
220.44	(R) Recept.	0		0	210.20(a)	(L) Lighting	0	125%	0
220.56	(K) Kitchen	0	100%	0		(EL) Ext. Ltg.	11,586	125%	14,483
220.60	(C) Cooling	0	0%	0	620.14	(E) Elevators	0	100%	0
220.60	(H) Heating	0	0%	0		(WH) Water Ht.	0	100%	0
220.60	(F) Fans	0	100%	0	220.5	(MT) Lrg. Mot.	0	125%	0
	(M) Misc.	0	100%	0		(SP) Sub Panel	0	100%	0

Total Connected Load 11,586 VA = 13.9 AMPS
Total Load (Diversified 14,483 VA = 17.4 AMPS

Location of Panel:

STATE OF TEXAS
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DBR Project Number 12801.000

E.P. | -- | -- | D.C.

CSJ NO: 0921-06-243
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CHECKED BY: DBR
PROJECT NO: 12801.001

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

ELECTRICAL SCHEDULES

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

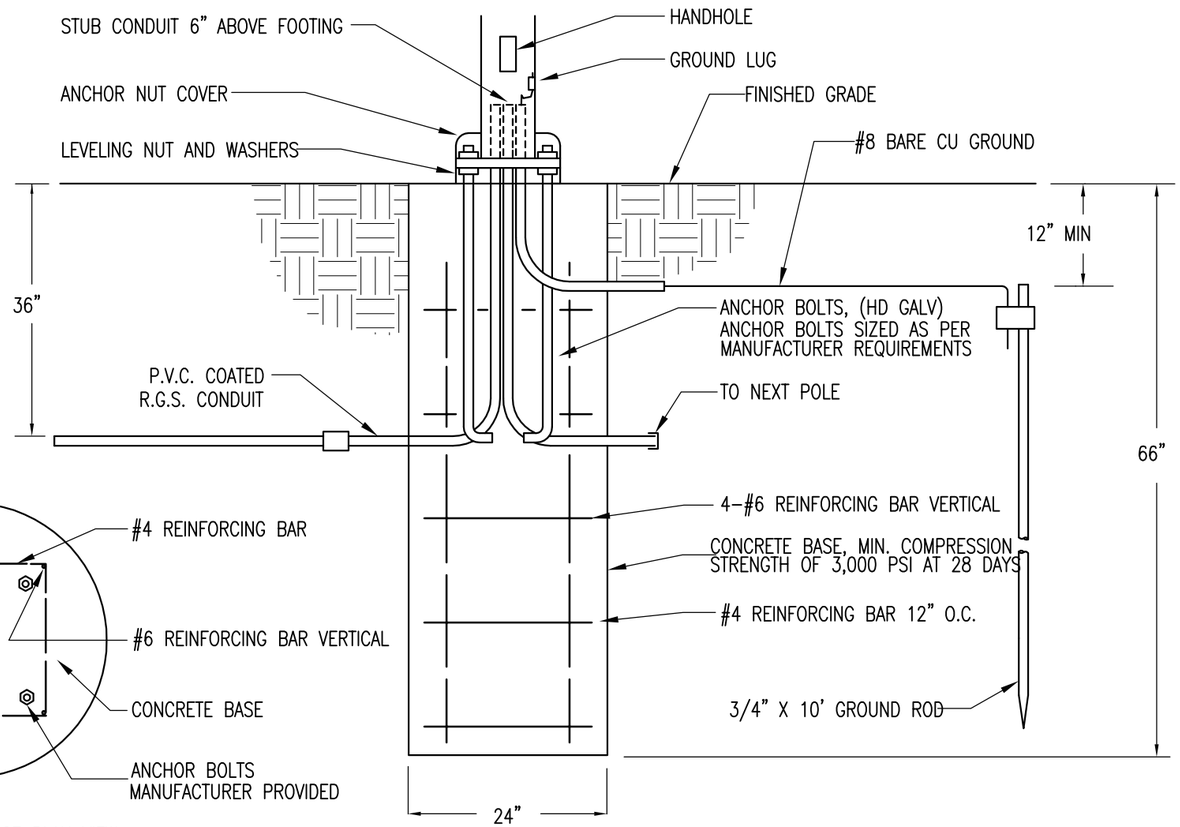
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SEAL:

SHEET NO: E2.1

LAYOUT NAME: E2.1
DATE: Aug 17, 2018 - 12:08PM
LAST SAVED: Aug 17, 2018 - 12:08PM
DRAWING FILE: I:\2012\12801.001\Drawings\DE-12801-EID-EHR_ELEC_SITE(2).dwg



POLE BASE PLAN VIEW

NOTE: USE MANUFACTURER'S TEMPLATE
TO POSITION ANCHOR BOLTS.

CONCRETE POLE BASE DETAIL

1 TYPICAL CONCRETE POLE BASE DETAIL

NOT TO SCALE

CSJ NO: 0921-06-243
DATE: 07/31/15
SURVEYED BY: DBR
DESIGNED BY: DBR
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NO: 12801.001

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL
BEAUTIFICATION PROJECT
NOLANA AVE TO RR TRACKS

ELECTRICAL DETAILS 1

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

STATE OF TEXAS
EDWARD PUENTES
102338
LICENSED
PROFESSIONAL ENGINEER

07/31/2015

DBR ENGINEERING CONSULTANTS
200 South 10th Street
Suite 301
McAllen, Texas 78501
956.683.1940 p
956.683.1933 f

DBR Project Number 12801.000

E.P. | -- | -- | D.C.

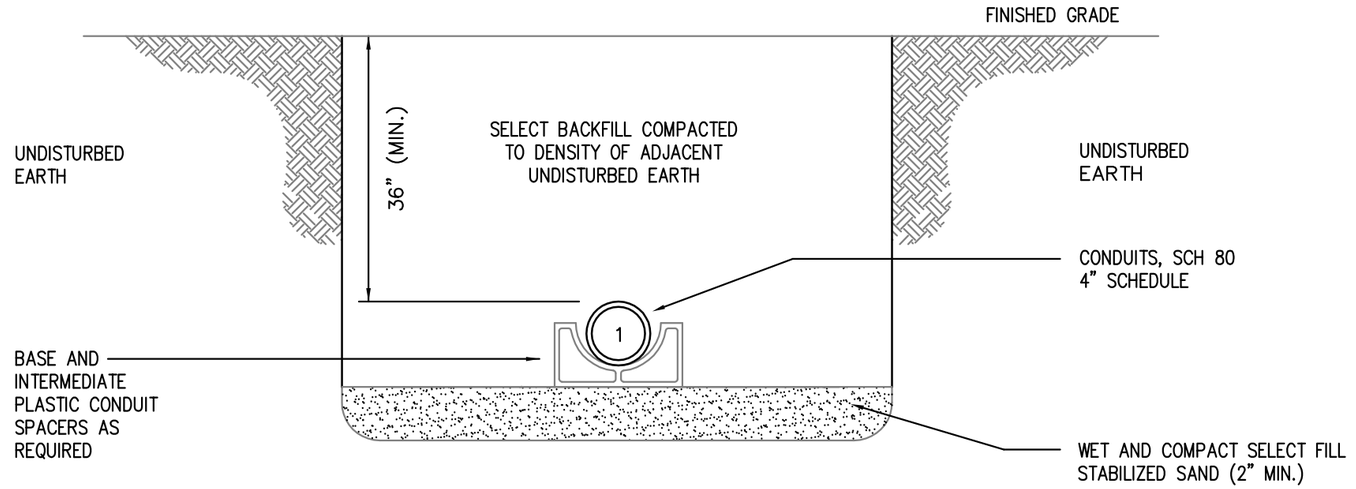
SCALE:

REVISIONS:
1.
2.
3.
4.

SEAL:

SHEET NO: E3.0

LAYOUT NAME: E3.0
DATE: Aug 06, 2015 - 4:34PM
LAST SAVED: Aug 06, 2015 - 4:22PM
DRAWING FILE: K:\12801.001\Drawings\DETAILS\DET-1280-EID-ELEC SITE(2).dwg



NOTE:

ALL UNDERGROUND CONDUITS ARE TO HAVE A MINIMUM OF 2" RED CONCRETE COVER ON ALL SIDES. RED DYE ON TOP OF CONCRETE IS NOT ACCEPTABLE.

1 PRIMARY SERVICE TRENCH DETAIL #1

NOT TO SCALE

STATE OF TEXAS
EDWARD PUENTES
102338
LICENSED
PROFESSIONAL ENGINEER

07/31/2015

DBR ENGINEERING CONSULTANTS
200 South 10th Street
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DBR Project Number 12801.000

E.P.	--	--	D.C.

CSJ NO:	0921-06-243
DATE:	07/31/15
SURVEYED BY:	DBR
DESIGNED BY:	DBR
DRAWN BY:	DBR
CHECKED BY:	DBR
PROJECT NO:	12801.001

PROJECT: BICENTENNIAL HIKE & BIKE TRAIL BEAUTIFICATION PROJECT NOLANA AVE TO RR TRACKS

ELECTRICAL DETAILS 2

CITY OF McALLEN
PARKS AND RECREATION DEPARTMENT

SCALE:

REVISIONS:
1.
2.
3.
4.

SEAL:

SHEET NO: E3.1

LAYOUT NAME: E3.1
DATE: AUG 06, 2015 - 4:33PM
LAST SAVED: AUG 06, 2015 - 4:22PM
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