Construction

Advertisement and Invitation for Bids

The City of Socorro will receive bids for Sparks Arroyo Drainage Improvements project located in Socorro, Texas until 2:00 p.m. on July 25, 2016 at 124 S. Horizon Blvd. Socorro, TX 79927. The bids will be publicly opened and read aloud at 2:30 p.m. on July 25, 2016 at 124 S. Horizon Blvd. Socorro TX 79927.

Bid/Contract Documents, including Drawings and Technical Specifications are on file at 124 S. Horizon Blvd. Socorro TX 79927 Copies of the Bid/Contract Documents may be obtained by depositing $ 50 with the City Clerk for each set of documents obtained. The deposit will be refunded if the documents and drawings are returned in good condition within 10 days following the bid opening.

A bid bond in the amount of 5 percent of the bid issued by an acceptable surety shall be submitted with each bid. A certified check or bank draft payable to the City of Socorro or negotiable U.S. Government Bonds in the amount of 5% of the bid may be submitted in lieu of the Bid Bond. Attention is called to the fact that not less than, the federally determined prevailing (Davis-Bacon and Related Acts) wage rate, as issued by the Texas Department of Agriculture Office of Rural Affairs and contained in the contract documents, must be paid on this project. In addition, the successful bidder must ensure that employees and applicants for employment are not discriminated against because of race, color, religion, sex, sexual identity, gender identity, or national origin.

The City of Socorro reserves the right to reject any or all bids or to waive any informalities in the bidding.

Bids may be held by the City of Socorro for a period not to exceed 30 days from the date of the bid opening for the purpose of reviewing the bids and investigating the bidder's qualifications prior to the contract award. Anibal Olague, Project Administrator 7/10/2016

All contractors/ subcontractors that are debarred, suspended or otherwise excluded from or ineligible for participation on federal assistance programs may not undertake any activity in part or in full under this project.

INSTRUCTION TO BIDDERS
FOR CONSTRUCTION

1. Use of Separate Bid Forms

These Contract Documents include a complete set of bid and Contract forms which are for the convenience of the bidders and are not to be detached from the contract document, completed or executed. Separate bid forms are provided for your use.

2. Interpretations or Addenda

No oral interpretations will be made to any bidder. Each request for clarification shall be made in writing to the City or Engineer no less than seven (7) days prior to the bid opening. Each interpretation made will be in the form of an Addendum to the Contract Documents and will be distributed to all parties holding Contract Documents no less than seven (7) days prior to the bid opening. It is, however, the bidder's responsibility to make inquiry as to any addenda issued. All such addenda shall become part of the Contract Documents and all bidders shall be bound by such addenda, whether or not received by the bidders.

If an addendum to the bid package is necessary, it must be distributed to each potential bidder. The distribution of an addendum shall be verified either by statements of receipt or registered/certified mail receipts, which shall be included in the public works construction file. The addendum shall allow adequate time for consideration in bid preparation (usually at least one week). If adequate time is not available, the bid opening date must be extended and the City must republish the invitation for bids containing the place, time, and date for the new bid opening. Note that any change to the original bid opening date will require republication of the invitation for bids at least once in a locally published newspaper. The republished notice will include the place, time and date for the new bid opening and must be published at least seven days prior to the new bid opening date.

3. Inspection of Site

Each bidder should visit the site of the proposed work and should become acquainted with the existing conditions and facilities, the difficulties and restrictions pertaining to the performance of the contract. The bidder should thoroughly examine and become familiar with the drawings, technical specifications and all other Contract Documents. The contractor by the execution of the contract shall in no way be relieved of any obligation under it due to failure to receive or examine any form or legal document or to visit the site or the conditions existing at the site. The City will be justified in rejecting any claim based on lack of inspection of the site prior to the bid.

4. Alternate bid items

No alternate bids or bid items will be considered unless they are specifically requested by the technical specifications.

5. Bids

a. All bids must be submitted on the forms provided and are subject to all requirements of the Contract Documents, including the Drawings.

b. All bids must be regular in every respect and no interlineation, excisions or special conditions may be made or included by the bidder.

c. Bid documents, including but not limited to the bid, the bid bond(s), the contractor's certifications, local opportunity plan, and the statement of the bidder's qualifications, shall be sealed in an envelope and clearly labeled with the words "Bid Documents", the project number, name of bidder and the date and time of bid opening.

d. The City may consider as irregular any bid on which there is an alteration of or departure from the bid form and, at its option, may reject any irregular bid.

e. If a contract is awarded, it will be awarded to a responsible bidder on the basis of the lowest/best bid and the selected alternate bid items, if any. The contract will require the completion of the work in accordance with the contract documents.

6. Bid Modifications Prior to Bid Opening

a. Any bidder may modify its bid in writing at any time prior to the scheduled closing time for receipt of bids, provided such modification is received by the locality prior to the closing time. The modification should not reveal the bid price but should provide the addition, subtractions or other modifications so that the final prices or terms will not be known by the locality until the sealed bid is open.

b. Likewise, any bidder may modify a bid by submitting a supplemental bid in person prior to the scheduled closing time for receipt of bids. Such supplemental bid should mention only additions or subtractions to the original bid so as to not reveal the final prices or terms to the locality until the sealed bid is open.

7. Bid Bond

a. A bid bond in the amount of 5% of the bid issued by an acceptable surety shall be submitted with each bid [for contracts greater than $100,000,]. A certified check or bank draft payable to the locality or negotiable U.S. Government Bonds (as par value) may be submitted in lieu of the Bid Bond.

b. The bid bond or its comparable, will be returned to the bidder as soon as practical after the opening of the bids.

8. Statement of Bidders Qualifications

Each bidder shall submit on the form furnished for that purpose a statement of the bidder's qualifications. The City shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform its obligations under the contract, and the bidder shall furnish the City all such information and data for this purpose as it may request. The right is reserved to reject any bid where an investigation of the available data does not satisfy the City that the bidder is qualified to carry out properly the terms of the contract.

9. Unit Price

The unit price for each of the several items in the bid shall include its pro rata share of overhead so that the sum of the products obtained by multiplying the quantity shown for each item by the unit price bid represents the total bid. Any bid not conforming to this requirement may be rejected as informal. Special

attention is drawn to this condition, as the unit prices will be used to determine the amount of any change orders resulting from an increase or decrease in quantities.

10. Corrections

Erasures or other corrections in the bid must be noted over the signature of the bidder.

11. Time for Receiving Bids

Bids received prior to the advertised hour of opening shall be kept securely sealed. The officer appointed to open the bids shall decide when the specified time has arrived and no bid received thereafter will be considered; except that when a bid arrives by mail after the time fixed for opening, but before the reading of all other bids is completed, and it is shown to the satisfaction of the City that the late arrival of the bid was solely due to delay in the mail for which the bidder was not responsible, such bid will be received and considered.

12. Opening of Bids

The City shall, at the time and place fixed for the opening of bids, open each bid and publicly read it aloud, irrespective of any irregularities therein. Bidders and other interested individuals may be present.

13. Withdrawal of Bids

Bidder may withdraw the bid before the time fixed for the opening of bids, by communicating its purpose in writing to the City. Upon receipt of such notice, the unopened bid will be returned to the bidder. The bid guaranty of any bidder withdrawing his bid will be returned promptly.

14. Award of Contract/Rejection of Bids

a. The contract will be awarded to the responsive, responsible Bidder submitting the lowest/best bid. The bidder selected will be notified at the earliest possible date. The locality reserves the right to reject any or all bids and to waive any informality in bids received where such rejection or waiver is in its interest.

b. The City reserves the right to consider as unqualified to do the work any bidder who does not habitually perform with his own forces the major portions of the work involved in construction of the improvements embraced in this contract.

15. Execution of Agreement/Performance and Payment Bonds

a. Performance Bonds - All prime contractors which enter into a formal contract in excess of $100,000 with the State, any department, board, agency, municipality, county, school district or any division or subdivision thereof, is required to obtain a Performance Bond in the amount of the contract before commencing with the Work.

b. Payment Bonds- All prime contractors which enter into a formal contract in excess of $25,000 with the State, any department, board, agency, municipality, county, school district or any division or subdivision thereof, is required to obtain a payment bond The payment bond must be in the amount of the Contract before commencing the Work.

c. The failure of the successful bidder to execute the agreement and supply the required bonds within thirty (30) days from the date of the notice of award-or within such extended period as the locality may grant, shall constitute a default and the locality may, at its option either award the contract to the next lowest responsible bidder, or re-advertise for bids. In either case, the locality may charge against the bidder the difference between the amount of the bid, and the amount for which a contract is subsequently executed irrespective of whether this difference exceeds the amount of the bid bond. If a more favorable bid is received through re-advertisement, the defaulting bidder shall have no claim against the locality for a refund.

d. The Bonds shall be issued in accordance with Chapter 2253, Texas Government Code, and must comply in all respects with Sections 3503.003 and 3503.004 of the Texas Insurance Code.

16. Wages and Salaries

Attention is particularly called to the requirement of paying not less than the (a) prevailing Davis Bacon Related Acts (DBRA) wage rates or (b) the City's prevailing wage rates specified in the Contract Documents, whichever is higher. These rates are minimums to be paid during the life of the contract. It is therefore the responsibility of the Bidder to inform themselves as to local labor conditions.

17. Equal Employment Opportunity

Attention is called to the requirements for ensuring that employees and applicants for employment are not discriminated against because of race, color, religion, sex, sexual identity, gender identity, or national origin, and other civil rights requirements.

BID FORM

PROJECT IDENTIFICATION: TxCDGB Project No. 7215479

Sparks Arroyo Drainage Improvements –
City of Socorro, Texas

Name and Address of Owner: City of Socorro, Texas
124 S. Horizon Boulevard
Socorro, Texas 79927

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for thirty days after the day of Bid opening. In the case of State or Federal funded projects, all Bids will remain subject to acceptance for 90 days or such reasonable time as the funding agency may require. BIDDER will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within fifteen days after the date of OWNER's Notice of Award.

3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

   A. BIDDER has examined copies of all the Bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

Date	Number

   B. BIDDER has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all Applicable Laws that in any manner may affect cost, progress, performance or furnishing of the Work.

C. BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing underground facilities at or contiguous to the site and assumes responsibility for the accurate location of said underground facilities.

D. BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

E. BIDDER has given ENGINEER written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER.

F. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

G. All prices quotes by the BIDDER shall be entirely in United States Currency (U.S. Dollars). Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

4. Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Item No.	**Estimated Quantity**	**UOM**	**Brief Description of Item**	**Unit Bid Price**	**Extended Amount (Qty x Unit Price)**
1.	1	L.S.	Insurance, Bonds, and Move-In Related Expenses, Not to Exceed 5% of Bid Item Nos. 2 through 18. If Item No. 1 Exceeds 5%, bid may be deemed non-responsive).	$_____	$_____
2.	3,630	S.Y.	Site Clearing and Grubbing	$_____	$_____
3.	3,475	C.Y.	Earthworks: Cut	$_____	$_____
4.	3,400	C.Y.	Earthworks: Soil Blending / Processing (*50/50 Blending Ratio to meet Geo-technical Specifications*)	$_____	$_____

Item No.	Estimated Quantity	UOM	Brief Description of Item	Unit Bid Price	Extended Amount (Qty x Unit Price)
5.	3,400	C.Y.	Earthworks: Fill	$_____	$_____
6.	1,829	C.Y.	Earthworks: Export To Waste	$_____	$_____
7.	1,700	C.Y.	Imported Engineered Fill	$_____	$_____
8.	2,212	S.F.	Loose Rock Rip Rap (8" to 12")	$_____	$_____
9.	1,900	S.F.	Loose Rock Rip Rap (18" to 24")	$_____	$_____
10.	125	C.Y.	Gravel for Trench Drain (3/4" to 1")	$_____	$_____
11.	295	L.F.	Concrete Channel (*Maintenance Ramp Inclusive*)	$_____	$_____
12.	4,112	S.Y.	Pyramat High Performance TRM, or approved equal	$_____	$_____
13.	1,520	S.Y.	28-Mil Geotextile Fabric	$_____	$_____
14.	54	C.Y.	Gabion, Matress, Complete In Place	$_____	$_____
15.	90	L.F.	PVC Waterstop	$_____	$_____
16.	1	L.S.	Stabalized Construction Entrance	$_____	$_____
17.	699	L.F.	Stormwater Pollution Prevention: Silt Fence	$_____	$_____
18.	1	L.S.	Site Clean-up, Demobilization	$_____	$_____

TOTAL BID PRICE (ITEMS 1 THROUGH 18) $_____

Quantities are not guaranteed.

5. Communications concerning this Bid shall be addressed to the following named individual, address, telephone number, and facsimile number:

Name: _____

Address: _____

_____

Phone: _____ Fax: _____ E-mail: _____

6. The terms used in this Bid which are defined in the General Conditions of the Construction Contract included as part of the Contract Documents have the meanings assigned to them in the General Conditions.

SUBMITTED on _____. 201____.

If BIDDER is:

An Individual

By _____ (SEAL)
(Name of Bidder)

_____
(Title) (Signature)

doing business as _____

Business address: _____

_____

Phone No.: _____

A Partnership

By _____ (SEAL)
(Firm Name)

_____
(Signature – general partner)

Business address: _____

_____

Phone No.: _____

A Corporation/LLC

By _____
(Corporation/LLC Name)

_____
(State of Formation and State of Principal Place of Business)

By _____
(Name of Person Authorized to Sign)

_____
(Title) (Signature)

(Seal)

Attest _____
(Secretary)

Business address: _____

Phone No.: _____

Federal Tax Identification Number: _____

When proposing as a Corporation/LLC, Bidder swears and affirms by signing this Bid that the proposing Corporation/LLC is currently in existence, is currently authorized to do business in the State of Texas and that no franchise tax reports or payments are delinquent as of the date of this Bid Proposal. The Bidder will provide a Certificate of Account Status with the signed Contract Documents.

Equal Opportunity Guidelines for Construction Contractors

Note: To be included in bid packet and distributed at the preconstruction conference (optional)

1. **What are the responsibilities of the offeror or bidder to ensure equal employment opportunity?**
   For contracts over $ 10,000, the offeror or bidder must comply with the "Equal Opportunity Clause" and the "Standard Federal Equal Opportunity Construction Contract Specifications."

2. **Are construction contractors required to ensure a legal working environment for all employees?**
   Yes, it is the construction contractor's responsibility to provide an environment free of harassment, intimidation, and coercion to all employees and to notify all foremen and supervisors to carry out this obligation, with specific attention to minority or female individuals.

3. **To alleviate developing separate facilities for men and women on all sites, can a construction contractor place all women employees on one site?**
   No, two or more women should be assigned to each site when possible.

4. **Are construction contractors required to make special outreach efforts to Section 3 or minority and female recruitment sources?**
   Yes, construction contractors must establish a current list of Section 3, minority and female recruitment sources. Notification of employment opportunities, including the availability of on-the-job training and apprenticeship programs, should be given to these sources. The efforts of the construction contractors should be kept in file.

5. **Should records be maintained on the number of Section 3 residents, minority and females applying for positions with construction contractors?**
   Yes, records must be maintained to include a current list of names, addresses and telephone numbers of all Section 3, minority and female applicants. The documentation should also include the results of the applications submitted.

6. **What happens if a woman or minority is sent to the union by the Contractor and is not referred back to the Contractor for employment?**
   If the unions impede the construction contractor's responsibility to provide equal employment opportunity, a written notice should be submitted to TDA.

7. **What efforts are made by construction contractors to create entry-level positions for Section 3 residents, women and minorities?**
   Construction contractors are required to develop on-the-job training programs, or participate in training programs, especially those funded by the Department of Labor, to create positions for Section 3 residents, women and minorities and to meet employment needs.

8. **Are any efforts made by the Contractor to publicize their Equal Employment Opportunity (EEO) policy?**
   Yes, the construction contractor is responsible for notifying unions and sources of training programs of their equal employment opportunity policy. Unions should be requested to cooperate in the effort of equal opportunity. The policy should be included in any appropriate manuals, or collective bargaining agreements. The construction contractor is encouraged to publicize the equal

employment opportunity policy in the company newspaper and annual report. The Contractor is also responsible to include the EEO policy in all media advertisement.

9. **Are any in-service training programs provided for staff to update the EEO policy?**
At least annually a review of the EEO policy and the affirmative action obligations are required of all personnel employees of a decision-making status. A record of the meeting including date, time, location, persons present, subject matter discussed, and disposition of the subject matter should be maintained.

10. **What recruitment efforts are made for Section 3 residents, minorities and women?**
The construction contractor must notify, both orally and in writing, Section 3, minority and female recruitment sources one month prior to the date of acceptance for apprenticeship or other training programs.

11. **Are any measures taken to encourage promotions for minorities and women?**
Yes, an annual evaluation should be conducted for all minority and female personnel to encourage these employees to seek higher positions.

12. **What efforts are taken to insure that personnel policies are in accordance with the EEO policy?**
Personnel policies in regard to job practices, work assignments, etc. should be continually monitored to insure that the EEO policy is carried out.

13. **Can women be excluded from utilizing any facilities available to men?**
No, all facilities and company activities are non-segregated except for bathrooms or changing facilities to ensure privacy.

14. **What efforts should be utilized to include minority and female contractors and suppliers?**
Take affirmative steps to ensure that small, minority, and women owned businesses are included on all lists for contractors/service providers. Solicit these businesses when issuing RFPs and RFQs and soliciting construction bids. Divide project activities into small tasks to allow participation. Keep records of all offers to minority and female construction contractors.

15. **If a construction contractor participates in a business related association that does not comply with equal opportunity affirmative action standards, does that show his/her failure to comply?**
No, the construction contractor is responsible for its own compliance.

16. **Can a construction contractor hire a subcontractor who has been debarred from government contracts pursuant to EEO?**
No. The construction contractor must suspend, terminate or cancel its contract with any Subcontractor who is in violation of the EEO policy.

17. **What effort has been taken by the construction contractor to monitor all employment to insure the company EEO policy is being carried out?**
The construction contractor must designate a responsible individual to keep accurate records of all employees that includes specific information required by the government.

Section 3 Policy

In accordance with 12 U.S.C. 1701u the City of Socorro agrees to implement the following steps, which, to *the greatest extent feasible*, will provide job training, employment and contracting opportunities for Section 3 residents and Section 3 businesses of the areas in which the program/project is being carried out.

A. Introduce and pass a resolution adopting this plan as a policy to strive to attain goals for compliance to Section 3 regulations by increasing opportunities for employment and contracting for Section 3 residents and businesses.

B. Assign duties related to implementation of this plan to the designated Equal Rights Officer.

C. Notify Section 3 residents and business concerns of potential new employment and contracting opportunities as they are triggered by TxCDBG grant awards through the use of: Public Hearings and related advertisements; public notices; bidding advertisements and bid documents; notification to local business organizations such as the Chamber(s) of Commerce or the Urban League; local advertising media including public signage; project area committees and citizen advisory boards; local HUD offices; regional planning agencies; and all other appropriate referral sources. Include Section 3 clauses in all covered solicitations and contracts.

D. Maintain a list of those businesses that have identified themselves as Section 3 businesses for utilization in TxCDBG funded procurements, notify those businesses of pending contractual opportunities, and make this list available for general Grant Recipient procurement needs.

E. Maintain a list of those persons who have identified themselves as Section 3 residents and contact those persons when hiring/training opportunities are available through either the Grant Recipient or contractors.

F. Require that all Prime contractors and subcontractors with contracts over $100,000 commit to this plan as part of their contract work. Monitor the contractors' performance with respect to meeting Section 3 requirements and require that they submit reports as may be required by HUD or TDA to the Grant Recipient.

G. Submit reports as required by HUD or TDA regarding contracting with Section 3 businesses and/or employment as they occur; and submit reports within 20 days of calendar year end which identify and quantify Section 3 businesses and employees.

H. Maintain records, including copies of correspondence, memoranda, etc., which document all actions taken to comply with Section 3 regulations.

As officers and representatives of the City of Socorro, we the undersigned have read and fully agree to this plan, and become a party to the full implementation of this program.

Signature	Title	Date
	Mayor	5-5-16

CONTRACT WAGE RATE

Superseded General Decision Number: TX20150052

State: Texas

Construction Type: Heavy

County: El Paso County in Texas.

HEAVY CONSTRUCTION, (INCLUDING WATER/SEWER LINES)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the 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 $10.15 (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 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number Publication Date

0 01/08/2016

* ELEC0583-003 12/01/2014

HEAVY CONSTRUCTION (INCLUDING WATER/SEWER LINES)

	Rates	Fringes
ELECTRICIAN	$ 23.52	$6.65 + 5.25%

SUTX2005-015 05/13/2005

	Rates	Fringes
ELECTRICIAN	$ 23.52	$6.65 + 5.25%

SUTX2005-015 05/13/2005

Rates

CARPENTER, Includes Form Work....$ 12.21 0.00

CEMENT MASON/CONCRETE FINISHER...$ 9.29 0.00

Laborers:

Common.....$ 7.96 0.00

Pipelayer.....$ 8.48 0.00

POWER EQUIPMENT OPERATOR:

Backhoe.....$ 11.57 0.00

Front End Loader.....$ 10.43 0.00

Grader.....$ 11.19 0.00

TRUCK DRIVER.....$ 9.17 0.00

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

Fringes

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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.

CONSTRUCTION CONTRACT

THIS AGREEMENT made this the _____ day of _____, _____, by and between _____, a _____ hereinafter called the "Contractor", and the City of Socorro, Texas hereinafter called the "City."

WITNESSETH, that the Contractor and the City for the considerations stated herein mutually agree as follows:

ARTICLE 1. Statement of Work. The Contractor shall furnish all supervision, technical personnel, labor, materials, machinery, tools, equipment and services, including utility and transportation services, and perform and complete all work required for the construction of the Improvements embraced in the Project; namely, _____ and required supplemental work for the _____ Texas Community Development Block Grant (TxCDBG) project (the "Project"), all in strict accordance with the Contract Documents including all addenda thereto, numbered 7215479, dated _____ and _____, all as prepared by CSA Design Group, Inc. acting and in these Contract Documents, referred to as the "Engineer" (the "Work").

ARTICLE 2. The Contract Price. The City will pay the Contractor for the performance of the Contract in current funds, for the total quantities of Work performed at the unit prices stipulated in the Bid for the several respective items of Work completed subject to additions and deductions as provided in the maximum aggregate amount of $_____.

ARTICLE 3. The Contract Documents. The Contract Documents shall consist of the following components:

a. This Agreement
b. Addenda
c. Invitation for Bids
d. Instructions to Bidders
e. Signed Copy of Bid
f. General Conditions, Part I
g. Special Conditions
h. Technical Specifications
i. Drawings (as listed in the Schedule of Drawings)

ARTICLE 4. Contract Time. The Contractor agrees to commence the Work on the date specified in a written Notice to Proceed issued by the City, and Contractor shall complete the WORK within _____ consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, _____.

ARTICLE 5. Liquidated Damages. Contractor acknowledges that completion of the Project within the Contract Time is an important factor in the award of this Contract to Contractor and intangible harm and damages may result to City for delay in use of the Project. Contractor further acknowledges that damages for delay in completion of the Project are incapable or difficult to ascertain because of their indefiniteness and uncertainty. The parties desire to liquidate their damages and have mutually agreed that the liquidated damages amount set forth below is a reasonable forecast of just compensation to City for the harm cause by delay in the completion of the Project. Accordingly, if the Contractor fails to achieve Substantial Completion of the Project within the Contract Time, the City shall be entitled to retain or recover from the Contractor and the Contractor's surety, as liquidated damages and not as a penalty, the following per diem amount commencing upon the first day following expiration of the Contract Time and continuing until the actual date of Substantial Completion: $1,000.00.

This Agreement, together with other documents enumerated in this ARTICLE 3, which are as fully a part of the Contract Documents as if hereto attached or herein repeated, forms the Contract between the parties

hereto. In the event that any provision in any component part of this Contract conflicts with any provision of any other component part, the provision of the component part first enumerated in this ARTICLE 3 shall govern, except as otherwise specifically stated.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed in triplicate (Note 3) original copies on the day and year first above written.

_____
(*The Contractor*)

By_____

Title _____

City of Socorro
(City)

By _____

_____

Title _____

Entity Certification

I, _____, certify that I am the _____ of the corporation/LLC named as Contractor herein; that _____ who signed this Agreement on behalf of the Contractor, was then _____ of said corporation/LLC; that said Agreement was duly signed for and in behalf of said corporation/LLC by authority of its governing body, and is within the scope of its organizational powers.

Corporate
Seal

_____
(*Corporate Secretary*)

GENERAL CONDITIONS - PART I
FOR CONSTRUCTION

1. TxCDBG Assistance

The Project to be constructed pursuant to this Contract will be financed with assistance from the Texas Department of Agriculture - Office of Rural Affairs through a Community Development Block Grant (TxCDBG) and is subject to all Applicable Laws.

2. Definitions

Whenever used in any of the Contract Documents, the following meanings shall be given to the terms here in defined:

(a) The term "Contract" means the Agreement executed between the City of Socorro, hereinafter called the "City" and (Name of Construction Co.), hereinafter called "Contractor", together with the other Contract Documents of which these GENERAL CONDITIONS, form a part.

(b) The term "Project Area" means the area within the specified Contract limits of the improvements contemplated to be constructed in whole or in part under this contract.

(c) The term "Engineer" means CSA Design Group, Inc., Engineer in charge, serving the City with architectural or engineering services, his successor, or any other person or persons, employed by the City for the purpose of directing or having in charge of the Work embraced in this Contract.

(d) The term "Contract Documents" means and shall include the following: Executed Agreement, Addenda (if any), Invitation for Bids, Instructions to Bidders, Signed Copy of Bid, General Conditions Part I, Special Conditions, Technical Specifications, and Drawings (as listed in the Schedule of Drawings).

(e) The term "Applicable Laws" means all Federal, State and City laws, rules, statutes, regulations, codes, ordinances and lawful orders of any public authority applicable to the Contract or the Work.

3. Supervision By Contractor

(a) Except where the Contractor is an individual and personally supervises the Work, the Contractor shall provide a competent superintendent, satisfactory to the Engineer, on the Work at all times during working hours with full authority to act as Contractor's agent. The Contractor shall also provide adequate staff for the proper coordination and expediting of his Work.

(b) The Contractor shall be responsible for all Work executed under the Contract. Contractor shall verify all figures and elevations before proceeding with the Work and will be held responsible for any error resulting from his failure to do so.

4. Subcontracts

(a) The Contractor shall not execute an agreement with any subcontractor or permit any subcontractor to perform any Work included in this contract until Contractor has verified the subcontractor is eligible to participate in federally funded contracts.

(b) No proposed subcontractor shall be disapproved by the City except for cause.

(c) The Contractor shall be as fully responsible to the City for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them.

(d) Nothing contained in the Contract shall create any contractual relation between any subcontractor and the City.

5. Fitting and Coordination of Work

The Contractor shall be responsible for the proper fitting of all Work and for the coordination of the operations of all trades, subcontractors, or material suppliers engaged upon this Contract.

6. Payments to Contractor

(a) Partial Payments

1) The Contractor shall prepare the requisition for partial payment as of the last day of the month and submit it, with the required number of copies, to the Engineer for approval. The amount of the payment due the Contractor shall be determined by adding to the total value of Work completed to date, the value of materials properly stored on the site and deducting (1) ten percent (10%) of the total amount, to be retained until final payment, and (2) the amount of all previous payments. The total value of Work completed to date shall be based on the estimated quantities of Work completed and on the unit prices contained in the agreement. The value of materials properly stored on the site shall be based upon the estimated quantities of such materials and the invoice prices. Copies of all invoices shall be available for inspection of the Engineer.

2) Monthly or partial payments made by the City to the Contractor are advanced for the purpose of assisting the Contractor to expedite the Work of construction. The Contractor shall be responsible for the care and protection of all materials and Work upon which payments have been made until final acceptance of such Work and materials by the City. Such payments shall not constitute a waiver of the right of the City to require the fulfillment of all terms of the Contract and the delivery of all improvements embraced in this Contract complete and satisfactory to the City in all details.

(b) Final Payment

1) After final inspection and the acceptance by the City of all Work under the Contract, the Contractor shall prepare the requisition for final payment which shall be based upon the careful inspection of each item of Work at the applicable unit prices stipulated in the Contract. The total amount of the final payment due the Contractor under this Contract shall be the amount computed as described above less all previous payments.

2) Before paying the final estimate, City shall require the Contractor to furnish releases or receipts from all subcontractors having performed any Work and all persons having supplied materials, equipment (installed on the Project) and services to the Contractor. The City may make payment in part or in full to the Contractor without requiring the furnishing of such releases or receipts and any payments made shall in no way impair the obligations of any surety or sureties furnished under this Contract.

3) Any amount due the City under Liquidated Damages, shall be deducted from the final payment due the contractor.

(c) Payments Subject to Submission of Certificates

Each payment to the Contractor by the City shall be made subject to submission by the Contractor of all written certifications required of it and its subcontractors.

(d) Withholding Payments

The City may withhold any payment due the Contractor as deemed necessary to protect the City, and if so elects, may also withhold any amounts due from the Contractor to any subcontractors or material dealers, for Work performed or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the City and will not require the City to determine or adjust any claims or disputes between the Contractor and its subcontractors or material dealers, or to withhold any moneys for their protection unless the City elects to do so. The failure or refusal of the City to withhold any moneys from the Contractor shall in no way impair the obligations of any surety or sureties under any bond or bonds furnished under this Contract.

(e) Retainage

The City shall, for all public work contracts in excess of $400,000.00, invest all retainage over five percent (5%) of payments, if any, under the Contract in an interest bearing account and pay such interest to the Contractor upon completion of the Contract. All other applicable terms and definitions in Section 2252.031 – 2252.033, Texas Government Code, are hereby incorporated by reference in this paragraph.

7. Changes in the Work

(a) The City may make changes in the scope of Work required to be performed by the Contractor under the Contract without relieving or releasing the Contractor from any obligations under the Contract or any guarantee given pursuant to the Contract provisions, and without affecting the validity of the guaranty bonds, and without relieving or releasing the surety or sureties of said bonds. All such Work shall be executed under the terms of the original Contract unless it is expressly provided otherwise. Additionally, all such change orders must be approved by TxCDBG prior to execution of same.

(b) Except for the purpose of affording protection against any emergency endangering health, life, limb or property, the Contractor shall make no change in the materials used or in the specified manner of constructing and/or installing the improvements or supply additional labor, services or materials beyond that actually required for the execution of the Contract, unless in pursuance of a written order from the City authorizing the Contractor to proceed with the change. No claim for an adjustment of the Contract Price will be valid unless so ordered.

(c) If applicable unit prices are contained in the Contract, the City may order the Contractor to proceed with desired unit prices specified in the Contract; provided that in case of a unit price contract the net value of all changes does not increase the original total amount of the agreement by more than twenty-five percent (25%) or decrease the original the total amount by eighteen percent (18%).

(d) Each change order shall include in its final form:

1) A detailed description of the change in the Work.

2) The Contractor's proposal (if any) or a confirmed copy thereof.

3) A definite statement as to the resulting change in the contract price and/or time.

4) The statement that all Work involved in the change shall be performed in accordance with contract requirements except as modified by the change order.

5) The procedures as outlined in this Section for a unit price contract also apply in any lump sum contract.

8. Claims for Extra Cost

(a) If the Contractor claims that any instructions by City or otherwise involve extra cost or extension of time, he shall, within ten days after the receipt of such instructions, and in any event before proceeding to execute the Work, submit his protest thereto in writing to the City, stating clearly and in detail the basis of his objections. No such claim will be considered unless so made.

(b) Claims for additional compensation for extra Work, due to alleged errors in ground elevations, contour lines, or bench marks, will not be recognized unless accompanied by certified survey data, made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted, or would result, in handling more material, or performing more Work, than would be reasonably estimated from the Drawings and maps issued.

(c) Any discrepancies which may be discovered between actual conditions and those represented by the Drawings and maps shall be reported at once to the City and Work shall not proceed except at the Contractor's risk, until written instructions have been received from the City.

(d) If, on the basis of the available evidence, the City determines that an adjustment of the Contract Price and/or time is justifiable, a change order shall be executed.

9. Termination, Delays, and Liquidated Damages

(a) Right of the City to Terminate Contract.

In the event that any of the provisions of the Contract are violated by the Contractor, or by any subcontractors, the City may serve written notice upon the Contractor and the Surety of its intention to terminate the Contract. The notices shall contain the reasons for such intention to terminate the Contract, and unless such violation or delay shall cease and satisfactory arrangement of correction be made within ten days, the contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of any such termination, the City shall immediately serve notice thereof upon the Surety and the Contractor. The Surety shall have the right to take over and perform the contract. Provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the City may take over the Work and complete the project by bid/contract or by force account at the expense of the Contractor and his Surety shall be liable to the City for any excess cost incurred. In such event the City may take possession of and utilize in completing the Work, such materials, appliances, and plant as may be on the site of the Work and necessary therefore.

(b) Excusable Delays.

1) The right of the Contractor to proceed shall not be terminated nor shall the Contractor be charged with liquidated damages for any delays in the completion of the Work due to:

2) Any acts of the government, including controls or restrictions upon or requisitioning of materials, equipment, tools, or labor by reason of war, national defense, or any other national emergency;

3) Any acts of the City;

4) Causes not reasonably foreseeable by the parties to this Contract at the time of execution which are beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, terrorism, war, acts of another Contractor in the performance of some other contract with the City, fires, floods, epidemics, quarantine, restrictions, strikes, freight embargoes, and weather of unusual severity such as hurricanes, tornadoes, cyclones and other extreme weather conditions.

5) Provided, however, that the Contractor promptly notifies the City within ten (10) days in writing of the cause of the delay. Upon receipt of such notification, the City shall ascertain the facts and the cause and extent of delay. If, upon the basis of the facts and the terms of this contract, the delay is properly excusable, the City shall extend the time for completing the Work for a period of time commensurate with the period of excusable delay.

10. Assignment or Novation

The Contractor shall not assign nor transfer, whether by assignment or novation, any of its rights, duties, benefits, obligations, liabilities, or responsibilities under this Contract without the written consent of the City. No assignment or novation of the Contract shall be valid unless the assignment or novation expressly provides that the assignment of any of the Contractor's rights or benefits under the Contract is subject to a prior lien for labor performed, services rendered, and materials, tools, and equipment supplied for the performance of the Work under this Contract in favor of all persons, Contractors, or corporations rendering such labor or services or supplying such materials, tools, or equipment.

11. Technical Specifications and Drawings

Anything mentioned in the Technical Specifications and not shown on the Drawings or vice versa, shall be of like effect as if shown on or mentioned in both. In case of difference between Drawings and Technical Specifications, the Technical Specifications shall govern. In case of any discrepancy in Drawings, or Technical Specifications, the matter shall be immediately submitted to the City for review. Contractor shall be liable for any issues or expenses in the event the discrepancy is not submitted to the City.

12. Shop Drawings

(a) All required shop drawings, machinery details, layout drawings, etc. shall be submitted to the Engineer in five (5) hard copies for approval sufficiently in advance of requirements to afford ample time for checking, including time for correcting, resubmitting and rechecking if necessary. The Contractor may proceed, only at Contractor’s own risk, with manufacture or installation of any equipment or Work covered by said shop drawings, etc. until they are approved and no claim, by

the Contractor, for extension of the contract time shall be granted by reason of his failure in this respect.

(b) Any drawings submitted without the Contractor's stamp of approval will not be considered and will be returned to him for proper resubmission. If any drawings show variations from the requirements of the Contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment of contract price and/or time, otherwise the Contractor will not be relieved of the responsibility for executing the Work in accordance with the Contract even though the drawings have been approved.

(c) If a shop drawing is in accordance with the Contract or involves only minor adjustment in the interest of the City not involving a change in Contract Price or Time, the Engineer may approve the drawing. The approval shall not relieve the Contractor from responsibility to adhere to the Contract or for any error in the drawing.

13. Requests for Supplementary Information

It shall be the responsibility of the Contractor to make timely requests of the City for any additional information which should be furnished by the City under the terms of this Contract, and which is required in the planning and execution of the Work. Such requests may be submitted from time to time as the need approaches, but each shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay. Each request shall be in writing, and list the various items and the latest date by which each will be required by the Contractor. The first list shall be submitted within two weeks after Contract award and shall be as complete as possible at that time. The Contractor shall, if requested, furnish promptly any assistance and information the Engineer may require in responding to these requests of the Contractor. The Contractor shall be fully responsible for any delay in his Work or to others arising from his failure to comply fully with the provision of this section.

14. Materials and Workmanship

(a) Unless otherwise specifically provided for in the technical specifications, all workmanship, equipment, materials and articles incorporated in the Work shall be new and the best grade of the respective kinds for the purpose. Where equipment, materials, articles or workmanship are referred to in the technical specifications as "equal to" any particular standard, the Engineer shall decide the question of equality.

(b) The Contractor shall furnish to the City for approval the manufacturer's detailed specifications for all machinery, mechanical and other special equipment, which he contemplates installing together with full information as to type, performance characteristics, and all other pertinent information as required, and shall likewise submit for approval full information concerning all other materials or articles which he proposes to incorporate.

(c) Machinery, mechanical and other equipment, materials or articles installed or used without such prior approval shall be at the risk of subsequent rejection.

(d) Materials specified by reference to the number or symbol of a specific standard, shall comply with requirements in the latest revision thereof and any amendment or supplement thereto in effect on the date of the Invitation for Bids, except as limited to type, class or grade, or modified in the technical specifications shall have full force and effect as though printed therein.

(e) The City may require the Contractor to dismiss from the Work such employee or employees as the City or the Engineer may deem unqualified.

15. Samples, Certificates and Tests

(a) The Contractor shall submit all material or equipment samples, certificates, affidavits, etc., as called for in the Contract Documents or required by the Engineer, promptly after award of the Contract and acceptance of the Contractor's bonds. No such material or equipment shall be manufactured or delivered to the site, except at the Contractor's own risk, until the required samples or certificates have been approved in writing by the Engineer. Any delay in the Work caused by late or improper submission of samples or certificates for approval shall not be considered just cause for an extension of the contract time.

(b) Each sample submitted by the Contractor shall carry a label giving the name of the Contractor, the project for which it is intended, and the name of the producer. The accompanying certificate or letter from the Contractor shall state that the sample complies with contract requirements, shall give the name and brand of the product, its place of origin, the name and address of the producer and all specifications or other detailed information which will assist the Engineer in making a prompt decision regarding the acceptability of the sample. It shall also include the statement that all materials or equipment furnished for use in the project will comply with the samples and/or certified statements.

(c) Approval of any materials shall be general only and shall not constitute a waiver of the City's right to demand full compliance with Contract requirements. After actual deliveries, the Engineer will have such check tests made as he deems necessary in each instance and may reject materials and equipment and accessories for cause, even though such materials and articles have been given general approval. If materials, equipment or accessories which fail to meet check tests have been incorporated in the Work, the Engineer will have the right to cause their removal and replacement by proper materials or to demand and secure such reparation by the Contractor as is equitable.

(d) Independently of the Contractor, the City shall provide or contract for the construction material's engineering, testing and inspection services and the verification testing services necessary for acceptance of the Work by the City.

(e) Except as otherwise specifically stated in the Contract, the costs of sampling and testing will be divided as follows:

1) The Contractor shall furnish without extra cost, including packing and delivery charges, all samples required for testing purposes, except those samples taken on the project by the Engineer;

2) The Contractor shall assume all costs of re-testing materials which fail to meet Contract requirements;

3) The Contractor shall assume all costs of testing materials offered in substitution for those found deficient;

4) The Contractor shall be responsible for payment of overtime charges of any testing and laboratory personnel or City inspectors and any stand-by time of any testing and laboratory personnel. Overtime charges of any testing and laboratory personnel or City inspectors and any stand-by time of any testing and laboratory personnel shall be charged to the

Contractor on an as accrued basis, and shall be deducted from the next Application for Payment made by the Contractor.

(f) If any Work which is required to be inspected, tested or approved, is covered up without prior approval or consent of the City or the Engineer, it must, if requested by the City or the Engineer, be uncovered for observation and testing at the Contractor's expense.

16. Applicable Law

(a) Each and every provision and clause required by Applicable Law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein and even though a mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon request of either party, the Contract shall be promptly amended to make such insertion or correction.

(b) The Contractor shall give all notices required by and comply with all Applicable Laws. All construction Work and/or utility installations shall comply with all Applicable Laws. Before installing any Work, the Contractor shall examine the Drawings and Technical Specifications for compliance with Applicable Laws and shall immediately report any discrepancy to the City. Where the requirements of the Drawings and Technical specifications fail to comply with such Applicable Laws, the City will adjust the Contract by Change Order to conform to such ordinances or codes (unless waivers in writing covering the difference have been granted by the governing body or department) and make appropriate adjustment in the Contract Price or stipulated unit prices.

(c) Should the Contractor fail to observe the foregoing provisions and proceed with the construction and/or install any utility at variance with any Applicable Laws (notwithstanding the fact that such installation is in compliance with the Drawings and Technical Specifications), the Contractor shall remove such Work without cost to the City.

(d) The Contractor shall at his own expense, secure and pay for all permits for street pavement, sidewalks, shed, removal of abandoned water taps, sealing of house connection drains, pavement cuts, buildings, electrical, plumbing, water, gas and sewer permits required by the local regulatory body or any of its agencies.

(e) The Contractor shall comply with Applicable Laws governing the disposal of surplus excavation, materials, debris and rubbish on or off the Project Area and commit no trespass on any public or private property in any operation due to or connected with the Improvements contained in this Contract.

(f) The Contractor will be required to make arrangements for and pay the water, electrical power, or any other utilities required during construction.

(g) During construction of this project, the Contractor shall use every means possible to control the amount of dust created by construction. Prior to the close of a day's Work, the Contractor, if directed by the City, shall moisten the surrounding area to prevent a dusty condition.

17. Care of Work

(a) The Contractor shall be responsible for all damages to person or property that occur as a result of its fault or negligence of Contractor in connection with the prosecution of the Work and shall be

responsible for the proper care and protection of all materials delivered and Work performed until completion and final acceptance.

(b) In an emergency affecting the safety of life, limb or property, including adjoining property, the Contractor, without special instructions or authorization from the City is authorized to act to prevent such threatened loss or injury. Contractor shall follow all instructions of City.

(c) The Contractor shall avoid damage as a result of his operations to existing sidewalks, streets, curbs, pavements, utilities (except those which are to be replaced or removed), adjoining property, etc., and shall be responsible for completely repairing any damage thereto caused by the operations.

(d) The Contractor shall shore up, brace, underpin, secure, and protect as maybe necessary, all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be in any way affected by the excavations or other operations connected with the construction of the improvements included in this Contract. The Contractor shall be responsible for the giving of any and all required notices to any adjoining or adjacent property owner or other party before the commencement of any Work. The Contractor shall indemnify and save harmless the City from any damages on account of settlements or the loss of lateral support of adjoining property and from all loss or expense and all damages for which the City may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

18. Accident Prevention

(a) No laborer or mechanic employed in the performance of this Contract shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety as determined under construction safety and health standards promulgated by the Department of Labor.

(b) The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occur as a result of his prosecution of the Work.

(c) The Contractor shall maintain an accurate record of all cases of death, occupational disease, or injury requiring medical attention or causing loss of time from Work, arising out of and in the course of employment on Work under the Contract. The Contractor shall promptly furnish the City with reports concerning these matters.

(d) If the Contractor performs Work knowing it to be contrary to Applicable Law, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction. TO THE FULLEST EXTENT PERMITTED BY LAW, THE CONTRACTOR SHALL INDEMNIFY, DEFEND, PROTECT AND HOLD HARMLESS THE CITY, CONSULTANT, ITS OFFICERS, DIRECTORS, PARTNERS, REPRESENTATIVES, AGENTS, AND EMPLOYEES OF EACH OF THEM (COLLECTIVELY, THE "INDEMNITEES") FROM AND AGAINST ALL CLAIMS, DEMANDS, DAMAGES, CAUSES OF ACTION, LIABILITIES, LOSSES AND EXPENSES, INCLUDING WITHOUT LIMITATION ATTORNEYS' AND CONSULTANT'S FEES AND EXPENSES, ARISING OUT OF OR RESULTING FROM A CLAIM FOR BODILY INJURY OR DEATH OF AN EMPLOYEE OF THE CONTRACTOR, ITS AGENTS OR ITS SUBCONTRACTOR OF ANY TIER.

(e) The Contractor shall provide trench safety for all excavations more than five feet deep prior to excavation. All OSHA Standards for trench safety must be adhered to by the Contractor. The

Contractor shall bear responsibility for design and execution of acceptable trenching and shoring procedures in accordance with Texas Government Codes, Section 2166.303 and Texas Health and Safety Code, Chapter Section 756.021, et. seq.

(f) The contractor shall at all times conduct Work in such a manner as to ensure the least possible inconvenience to vehicular and pedestrian traffic. At the close of the Work each day, all streets where possible in the opinion of the City, shall be opened to the public in order that persons living in the area may have access to their homes or businesses by the use of the streets. Barricades, warning signs, and necessary lighting shall be provided to the satisfaction of the City at the expense of the Contractor.

19. Sanitary Facilities

The Contractor shall furnish, install and maintain ample sanitary facilities for laborers. As the needs arise, a sufficient number of enclosed temporary toilets shall be conveniently placed as required. Drinking water shall be provided from an approved source, so piped or transported as to keep it safe and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing and governing health regulations.

20. Use of Premises

(a) The Contractor shall confine equipment, storage of materials, and construction operations to the contract limits as shown on the Drawings and as prescribed by ordinances or permits, or as may be desired by the City, and shall not unreasonably encumber the site or public rights of way with materials and construction equipment.

(b) The Contractor shall comply with all reasonable instructions of the City and all existing Applicable Laws regarding signs, advertising, traffic, fires, explosives, danger signals, and barricades.

21. Removal of Debris, Cleaning, Etc.

The Contractor shall, periodically or as directed during the progress of the Work, remove and legally dispose of all surplus excavated material and debris, and keep the Project Area and public rights of way reasonably clear. Upon completion of the Work, he shall remove all temporary construction facilities, debris and unused materials provided for Work, and put the whole site of the Work and public rights of way in a neat and clean condition.

22. Inspection

(a) All materials and workmanship shall be subject to inspection, examination, or test by the City and Engineer at any and all times during manufacture or construction and at any and all places where such manufacture or construction occurs. The City shall have the right to reject defective material and workmanship or require its correction. Unacceptable workmanship shall be satisfactorily corrected. Rejected material shall be promptly segregated and removed from the Project Area and replaced with material of specified quality without charge. If the Contractor fails to proceed at once with the correction of rejected workmanship or defective material, the City may by contract or otherwise have the defects remedied or rejected materials removed from the Project Area and charge the cost of the same against any monies which may be due the Contractor, without prejudice to any other rights or remedies of the City.

(b) The Contractor shall furnish promptly all materials reasonably necessary for any tests which may be required. All tests by the City will be performed in such manner as not to delay the Work unnecessarily and will be made in accordance with the provisions of the technical specifications.

(c) The Contractor shall notify the City sufficiently in advance of back filling or concealing any facilities to permit proper inspection. If any facilities are concealed without approval or consent of the City, the Contractor shall uncover for inspection and recover such facilities at Contractor's expense, when so requested by the City.

(d) Should it be considered necessary or advisable by the City at any time before final acceptance of the entire Work to make an examination of Work already completed, the Contractor shall on request promptly furnish all necessary facilities, labor, and material. If such Work is found to be defective in any important or essential respect, due to fault of the Contractor or subcontractors, the Contractor shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such Work is found to meet the requirements of the Contract, the actual cost of labor and material necessarily involved in the examination and replacement, shall be reimbursable and if completion of the Work of the entire Contract has been delayed, a suitable extension of time will be approved.

(e) Inspection of materials and appurtenances to be incorporated in the improvements included in this Contract may be made at the place of production, manufacture or shipment, whenever the quantity justifies it, and such inspection and acceptance, unless otherwise stated in the technical specifications, shall be final, except as regards to: (1) latent defects, (2) departures from specific requirements of the Contract, (3) damage or loss in transit, or (4) fraud or such gross mistakes as amount to fraud. Subject to the requirements contained in the preceding sentence, the inspection of materials as a whole or in part will be made at the Project site.

(f) Neither inspection, testing, approval nor acceptance of the Work in whole or in part, by the City or its agents shall relieve the Contractor or its sureties of full responsibility for materials furnished or Work performed not in strict accordance with the Contract.

23. Review by City

The City and its authorized representatives and agents shall have access to and be permitted to observe and review all Work, materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this Contract, provided, however that all instructions and approval with respect to the Work will be given to the Contractor only by the City through its authorized representatives or agents.

24. Final Inspection

When the Improvements included in this Contract are substantially completed, the Contractor shall notify the City and Engineer in writing that the Work will be ready for final inspection on a definite date which shall be stated in the notice. The City and Engineer will make the arrangements necessary to have final inspection commenced on the date stated in the notice, or as soon thereafter as is practicable.

25. Deduction for Uncorrected Work

If the City deems it not expedient to require the Contractor to correct work not done in accordance with the Contract Documents, an equitable deduction from the Contract Price will be made by agreement between the Contractor and the City and subject to settlement, in case of dispute, as herein provided.

26. Insurance

(a) The Contractor shall carry and maintain in force the insurance described below and in accordance with the provisions of Chapter 1811 of the Texas Insurance Code. Prior to execution of the Contract, the Contractor shall procure insurance coverage in the types and amounts as follows:

Workmen's Compensation: (Including Waiver of Subrogation Endorsement)	All liability arising out of Contractor's employment of workers and anyone for whom Contractor shall be liable for Worker's Compensation claims. Worker's Compensation is required and no "alternative" form of insurance shall be permitted.
Employer's Liability:	$500,000.00
Commercial General Liability:	
Each Occurrence	$1,000,000.00
General Aggregate	$2,000,000.00 (A Designated Construction Project General Aggregate Limit shall be provided)
Personal & Advertising Injury	$1,000,000.00 each person
Products and Completed Operations	$1,000,000.00 (for one (1) year, commencing with issuance of final Certificate for Payment) $1,000,000.00 each occurrence
Property Damage	$2,000,000.00 aggregate
Independent Contractors	(same limits as above)
Contractual Liability	(same limits as above)
Automobile Liability:	
Bodily Injury/Property Damage	$1,000,000.00 combined single limit
Property Damage	$1,000,000.00 each occurrence $5,000,000.00 each occurrence/aggregate

All Risk Builders Risk against the perils of fire, lightening, wind storm, hurricane, hail, explosion, riot, civil commotion, smoke, aircraft, land vehicles, vandalism, malicious mischief, and all other perils in the amount one hundred percent (100%) of the value of the improvements including transit and materials stored off site. Additionally, this coverage shall provide protection to the full replacement value for boiler and machinery equipment up to installation, during testing, and until acceptance by Owner. If the Owner's property is damaged by the failure to maintain all required insurance, the Contractor shall bear all such damages. The general indemnification granted by the Contract in Section 18.(d) shall not be compromised or limited by the amount of insurance coverage.

(b) The required insurance must be written by a company licensed to do business in Texas at the time the policy is issued. In addition, the company must be acceptable to the City. The City's Representative will contact the State Board of Insurance to confirm that the issuing companies are admitted and authorized to issue such policies in the State of Texas. Certificates not complying

with the provisions of Chapter 1811 of the Texas Insurance Code [or not complying with Senate Bill 425, effective 1/1/12] as same may be amended, will not be accepted.

(c) The General Liability and Automobile so issued in the name of Contractor shall also name the City and Subcontractors as additional insureds, as their respective interests may appear. The coverage afforded to the additional insured under the policy or policies shall be primary insurance. It is the intent of the parties to this Agreement that the General Liability coverage required herein shall be primary to and shall seek no contribution from all insurance available to City, with City's insurance being excess, secondary and non-contributing. The Commercial General Liability coverage provided by Contractor shall be endorsed to provide such primary and non-contributing liability. If the additional insured has other insurance which is applicable to the loss, such other insurance shall be on an excess or contingent basis.

(d) If the insurance is written with stipulated amounts deductible under the terms of the policy, the Contractor shall pay the difference attributable to deductions in any payment made by the insurance carrier on claims paid by this insurance. If the City is damaged by the failure of the Contractor to maintain such insurance and to so notify the City then the Contractor shall bear all reasonable costs properly attributable thereto.

(e) The insurance required by Section 26.(a) shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents. Nothing contained herein shall limit or waive Contractor's legal or contractual responsibilities to City or others.

(f) Contractor shall have its insurance carrier(s) furnish to City insurance certificates in form satisfactory to City specifying the types and amounts of coverage in effect, the expiration dates of each policy, and a statement that no insurance will be canceled or materially changed while the Work is in progress without thirty (30) calendar day's prior written notice to City. Contractor shall permit City to examine the insurance policies, or at City's option, Contractor shall furnish City with copies, certified by the carrier(s), of insurance policies required in Section 26.(a) If Contractor neglects or refuses to provide any insurance required herein, or if any insurance is canceled, City may, but shall not be obligated to, procure such insurance and shall deduct the cost thereof from any sums due and owing to Contractor.

(g) Contractor and its Subcontractors shall not commence the shipment of equipment or materials or commence the Work at the site until all of the insurance coverage required of Contractor and its Subcontractors are in force and the necessary certificates and statements pursuant to Section 26.(f) hereof have been received by City and the Architect has issued a written notice to proceed.

(h) As an alternative and at City's option and expense, City may elect to furnish or to arrange for any part or all of the insurance required by Section 26. If City so elects, it shall notify, in writing, Contractor and issue a Change Order therefor, but no adjustment to the scheduled completion date or the Contract Sum shall be allowed.

(i) A copy of a certificate of insurance, a certificate of authority to self-insure issued by the Texas Workers' Compensation Commission, or a coverage agreement (DWC-81, DWC-82, DWC-83, or

DWC-84), showing statutory Workers' Compensation insurance coverage for the person's or entity's employees providing services on a Project is required 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 Texas Labor Code 406.096) include 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, contractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity that 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 do not include activities unrelated to the Project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

The Contractor shall 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 employees of the Contractor providing services on the Project for the duration of the Project.

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

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.

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 certificates of coverage showing coverage for all persons providing services on the Project; and

2. No later than seven (7) 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.

The Contractor shall retain all required certificates of coverage for the duration of the Project and for one (1) year thereafter.

The Contractor shall notify the governmental entity in writing by certified mail or personal delivery, within ten (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.

The Contractor shall post on each Project site a notice, in the text, form, 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.

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 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 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) 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 (1) year thereafter;

6 Notify the governmental entity in writing by certified mail or personal delivery, within ten (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

7. Contractually require each person with whom it contracts to perform as required by items a-f, with the certificates of coverage to be provided to the person for whom they are providing services.

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, civil penalties, or other civil actions.

The Contractor's failure to comply with any of these provisions is a breach of contract by the Contractor that 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.

The coverage requirement recited above does not apply to sole proprietors, partners, and corporate officers who are excluded from coverage in an insurance policy or certificate of authority to self-insure that is delivered, issued for delivery, or renewed on or after January 1, 1996. 28 TAC 110.110(i).

(j) The City and Contractor shall waive all rights against (1) each other and the Contractors, Subcontractors, agents and employees each of the other, and (2) the Engineer and separate Contractors, if any, and their contractors, Subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by property insurance applicable to the Work.

27. Warranty of Title

No material, supplies, or equipment to be installed or furnished under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale, lease-purchase or other agreement by which an interest is retained by the seller or supplier. The Contractor shall warrant good title to all materials, supplies, and equipment installed or incorporated in the work and upon completion of all Work, shall deliver the same, together with all improvements and appurtenances constructed or placed by Contractor, to the City free from any claims, liens, or charges. Neither the Contractor nor any person, firm, or corporation furnishing any material or labor for any Work covered by this Contract shall have any right to a lien upon any improvement or appurtenance. Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any law permitting such persons to look to funds due the Contractor. The provisions of this paragraph shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing materials for the Work when no formal contract is entered into for such materials.

28. Warranty of Workmanship and Materials

Neither the final certificate of payment nor any provision in the Contract nor partial or entire use of the improvements included in this Contract by the City or the public shall constitute an acceptance of Work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the Work and pay for any damage to other Work resulting therefrom which shall appear within a period of twelve (12) months from the date of final acceptance of the Work.

29. Job Offices

(a) The Contractor and its subcontractors may maintain such office and storage facilities on the site as are necessary for the proper conduct of the Work. These shall be located so as to cause no interference to any Work to be performed on the site. The City shall be consulted with regard to locations.

(b) Upon completion of the improvements, or as directed by the City, the Contractor shall remove all such temporary structures and facilities from the site, and leave the site of the Work in the condition required by the Contract.

30. Partial Use of Site Improvements

The City may give notice to the Contractor and place in use those sections of the improvements which have been completed, inspected and can be accepted as complying with the technical specifications and if in its opinion, each such section is reasonably safe, fit, and convenient for the use and accommodation for which it was intended, provided:

(a) The use of such sections of the Improvements shall in no way impede the completion of the remainder of the Work by the Contractor.

(b) The Contractor shall not be responsible for any damages or maintenance costs due directly to the use of such sections.

31. Local Program Liaison

For purposes of this Agreement, the City's Project Manager, Anibal Olague or equivalent authorized person will serve as the Local Program Liaison and primary point of contact for the Contractor. All required progress reports and communication regarding the project shall be directed to this liaison and other local personnel as appropriate.

32. Access to Information

(a) The Comptroller General of the United States, the City, TDA, and the Texas State Auditor's Office, or any successor agency or representative, shall have access to any books, documents, papers and records relating to the Contractor's agreement with the City or the administration, construction, engineering or implementation of the TxCDBG award between TDA and City.

(b) Contractor shall include the substance of this clause in all subcontracts it awards.

33. Records Retention

(a) The Contractor shall retain all required records for three years after the City makes its final payment and all pending matters are closed.

(b) Contractor shall include the substance of this clause in all subcontracts it awards.

34. Resolution of Program Non-Compliance and Disallowed Costs

In the event of any dispute, claim, question, or disagreement arising from or relating to this Contract, or the breach thereof, including determination of responsibility for any costs disallowed as a result of non-compliance with federal, state or TxCDBG program requirements, the parties hereto shall use their best efforts to settle the dispute, claim, question or disagreement. To this effect, the parties shall consult and negotiate with each other in good faith within 30 days of receipt of a written notice of the dispute or invitation to negotiate, and attempt to reach a just and equitable solution satisfactory to both parties. If the matter is not resolved by negotiation within 30 days of receipt of written notice or invitation to negotiate, the parties agree first to try in good faith to settle the matter by mediation administered by TAMS before resorting to arbitration, litigation, or some other dispute resolution procedure. The parties shall bear the costs of such mediation equally. If the matter is not resolved through such mediation within 60 days of the initiation of that procedure, either party may proceed to file suit.

35. Compliance with Davis-Bacon Act

All laborers and mechanics employed upon the Work covered by this Contract shall be paid unconditionally and not less often than once each week, and without subsequent deduction or rebate on any account (except such payroll deductions as are made mandatory by law and such other payroll deductions as are permitted by the applicable regulations issued by the Secretary of Labor, United States Department of Labor, pursuant to the Anti-Kickback Act hereinafter identified), the full amount due at time of payment computed at wage rates not less than those contained in the wage determination decision of said Secretary of Labor (**a copy of which is attached as Attachment A and herein incorporated by reference**), regardless of any contractual relationship which may be alleged to exist between the Contractor or any subcontractor and such laborers and mechanics. All laborers and mechanics employed upon such Work shall be paid in cash, except that payment may be by check if the employer provides or secures satisfactory facilities approved by the City for the cashing of the same without cost or expense to the employee. For the purpose of this clause, contributions made or costs reasonably anticipated under Section 1 (b) (2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section 5.5 (a) (1) (iv) of Title 29, Code of Federal Regulations. Also for the purpose of this clause, regular contributions made or costs incurred for more than a weekly period under plans, funds, or programs, but covering the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

The Contractor and its subcontractors shall not, by any means, induce any person employed in the construction, completion, or repair of public work, give up any part of the compensation to which he or she is otherwise entitled. The City must report all suspected or reported violations to TDA.

36. Conflicts of Interest.

(a) Governing Body. No member of the governing body of the City and no other officer, employee, or agent of the City, who exercises any functions or responsibilities in connection with administration, construction, engineering, or implementation of TxCDBG award between TDA and the City, shall have any personal financial interest, direct or indirect, in the Contractor or this Contract; and the City shall take appropriate steps to assure compliance.

(b) Other Local Public Officials. No other public official, who exercises any functions or responsibilities in connection with the planning and carrying out of administration, construction, engineering or implementation of the TxCDBG award between TDA and the City, shall have any personal financial interest, direct or indirect, in the Contractor or this Contract; and the Contractor shall take appropriate steps to assure compliance.

(c) The Contractor and Employees. The Contractor warrants and represents that it has no conflict of interest associated with the TxCDBG award between TDA and the City or this Contract. The Contractor further warrants and represents that it shall not acquire an interest, direct or indirect, in any geographic area that may benefit from the TxCDBG award between TDA and the City or in any business, entity, organization or person that may benefit from the award. The Contractor further agrees that it will not employ an individual with a conflict of interest as described herein. The Contractor shall execute and deliver to City a Certificate of Interested Parties, Form 1295, prior to execution of the Contract by the City.

37. Debarment and Suspension (Executive Orders 12549 and 12689)

The Contractor certifies, by entering into this Contract, that neither it nor its principals are presently debarred, suspended, or otherwise excluded from or ineligible for participation in federally-assisted programs under Executive Orders 12549 (3 CFR Part 1986 Comp., p. 189) and 12689 (3 CFR Part 1989

Comp., p. 235). The term "principal" for purposes of this Contract is defined as an officer, director, owner, partner, key employee, or other person with primary management or supervisory responsibilities, or a person who has a critical influence on or substantive control over the operations of the Contractor. The Contractor understands that it must not make any award or permit any award (or contract) at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs under Executive Order 12549, "Debarment and Suspension."

38. Procurement of Recovered Materials

The Contractor shall comply with section 6002 of the Solid Waste Act, as amended by the Resource Conservation and Recovery Act, procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired by the preceding fiscal year exceeded $10,000 as long as such procurement is economically feasible.

39. Anti-Lobbying

By execution of this Agreement, Contractor certifies, to the best of his or her knowledge and belief, that:

(a) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(c) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

40. Overtime Requirements

No Contractor or subcontractor contracting for any part of the Contract Work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any laborer or mechanic in any workweek in which he is employed on such Work to work in excess of 40 hours in such work week unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of 40 hours in such work week, as the case may be.

41. Clean Air Act and the Federal Water Pollution Control Act

The Contractor or subcontractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401–7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251–1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

42. Equal Opportunity Clause

During the performance of this Contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(b The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(c) The Contractor will not discourage or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(d) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(e) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(f) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and

the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(g) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(h) The Contractor will include the portion of the sentence immediately preceding paragraph (a) and the provisions of paragraphs (a) through (h) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

43. Section 109 of the Housing and Community Development Act of 1974

The Contractor shall comply with the provisions of Section 109 of the Housing and Community Development Act of 1974. No person in the United States shall on the ground of race, color, national origin, religion, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.

44. Section 504 Rehabilitation Act of 1973, as amended

The Contractor agrees that no otherwise qualified individual with disabilities shall, solely by reason of his/her disability, be denied the benefits of, or be subjected to discrimination, including discrimination in employment, under any program or activity receiving federal financial assistance.

45. Age Discrimination Act of 1975

The Contractor shall comply with the Age Discrimination Act of 1975 which provides that no person in the United States shall on the basis of age be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.

46. Economic Opportunities for Section 3 Residents and Section 3 Business Concerns

(a) The Work to be performed under this Contract is subject to the requirements of section 3 of the Housing and Urban Development (HUD) Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.

(b) The parties to this Contract agree to comply with HUD's regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this Contract, the parties to this Contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.

(c) The Contractor agrees to send to each labor organization or representative of workers with which the Contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the Contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the Work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the Work shall begin.

(d) The Contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The Contractor will not subcontract with any subcontractor where the Contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.

(e) The Contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the Contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the Contractor's obligations under 24 CFR part 135.

(f) Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this Contract for default, and debarment or suspension from future HUD assisted contracts.

(g) With respect to Work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the Work to be performed under this Contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

47. Contract Documents and Drawings

The City will furnish the Contractor without charge five (5) copies of the Contract Documents, including Technical Specifications and Drawings. Additional copies requested by the Contractor will be furnished at cost.

48. Contract Time

The Work to be performed under this Contract shall be fully completed within the Contract Time set forth in the Agreement.

49. Liquidated Damages

Contractor acknowledges that completion of the Project within the Contract Time is an important factor in the award of this Contract to Contractor and intangible harm and damages may result to City for delay in use of the Project. Contractor further acknowledges that damages for delay in completion of the Project are incapable or difficult to ascertain because of their indefiniteness and uncertainty. The parties desire to liquidate their damages and have mutually agreed that the liquidated damages amount set forth below is a reasonable forecast of just compensation to City for the harm cause by delay in the completion of the Project. Accordingly, if the Contractor fails to achieve Substantial Completion of the Project within the Contract Time, the City shall be entitled to retain or recover from the Contractor and the Contractor's surety, as liquidated damages and not as a penalty, the following per diem amount commencing upon the first day following expiration of the Contract Time and continuing until the actual Date of Substantial Completion: $1,000.00.

50. Gender Neutral - Gender References

When necessary, unless the context clearly requires otherwise, any gender-specific or gender-neutral term in this Contract (for example, he, she, it, etc.) is to be read as referring to any other gender or to no gender.

51. Texas Family Code

By signing this Agreement, the undersigned certifies as follows: "Under Section 231.006, Texas Family Code, the vendor or applicant certifies that the individual or business entity named in the contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate."

52. Immunity

Contractor stipulates that City is a political subdivision of the State of Texas, and, as such, may enjoy immunities from suit and liability under the Constitution and laws of the State of Texas. By entering into this Agreement, City does not waive any of its immunities from suit and/or liability, except as specifically authorized by law.

ATTACHMENT A

Superseded General Decision Number: TX20150052

State: Texas

Construction Type: Heavy

County: El Paso County in Texas.

HEAVY CONSTRUCTION, (INCLUDING WATER/SEWER LINES)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the 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 $10.15 (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 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/08/2016

* ELEC0583-003 12/01/2014

HEAVY CONSTRUCTION (INCLUDING WATER/SEWER LINES)

	Rates	Fringes
ELECTRICIAN	$ 23.52	$6.65 + 5.25%

SUTX2005-015 05/13/2005

	Rates	Fringes
CARPENTER, Includes Form Work	$ 12.21	0.00
CEMENT MASON/CONCRETE FINISHER	$ 9.29	0.00
Laborers:		
Common	$ 7.96	0.00
Pipelayer	$ 8.48	0.00
POWER EQUIPMENT OPERATOR:		
Backhoe	$ 11.57	0.00
Front End Loader	$ 10.43	0.00
Grader	$ 11.19	0.00
TRUCK DRIVER	$ 9.17	0.00

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

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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

CONTRACTOR'S LOCAL OPPORTUNITY PLAN

(name of company) agrees to implement the following specific affirmative action steps directed at increasing the utilization of lower income residents and businesses within the (City/County) of _____ _____.

A. To ascertain from the City's CDBG program official the exact boundaries of the project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plan.

B. To attempt to recruit from within the city the necessary number of lower income residents through: local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within and servicing the project area such as Service Employment and Redevelopment (SER), Opportunities Industrialization Center (OIC), Urban League, Concentrated Employment Program, Hometown Plan, or the U.S. Employment Service.

C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.

D. To insert this plan in all bid documents and to require all bidders on subcontracts to submit an affirmative action plan including utilization goals and the specific steps planned to accomplish these goals.

E. To ensure that subcontracts (greater than $10,000), which are typically let on a negotiated rather than a bid basis in areas other than the covered project area, are also let on a negotiated basis, whenever feasible, in a covered project area.

F. To formally contact unions, subcontractors, and trade associations to secure their cooperation in this effort.

G. To ensure that all appropriate project area business concerns are notified of pending sub-contractual opportunities.

H. To maintain records, including copies of correspondence, memoranda, etc., which document that all of the above affirmative action steps have been taken.

I. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this plan.

J. To maintain records concerning the amount and number of contracts, subcontracts, and purchases which contribute to objectives.

K. To maintain records of all projected work force needs for all phases of the project by occupation, trade, skill level, and number of positions and to update these projections based on the extent to which hiring meets these Local Opportunity objectives.

As officers and representatives of (name of company), we the undersigned have read and fully agree to this Plan, and become a party to the full implementation of the program and its provisions.

_____
Signature

_____
Printed Name

_____
Title

_____
Date

PROPOSED CONTRACTS BREAKDOWN

Type of Contracts	No. of Contracts	Approx. Total Dollar Amount	Estimated No. to local Business	Estimated $ Amount Local Business

ESTIMATED PROJECT WORKFORCE BREAKDOWN

Work Classifications	Total Estimated Positions	No. of Positions Currently Filled	No. of Positions not Filled	No. of Positions to fill with LM/ Residents
Totals				

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section l(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section l(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section l(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant ',to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by

the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration..... makes, utters or publishes any statement knowing the same to be false..... shall be fined not more than $5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable where the amount of the prime contract exceeds $100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in sub paragraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds $100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. **This statement must be notarized.** If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information it desires.

Date: _____

Bidder (Legal Name of Firm): _____

Date Organized: _____

Address: _____

_____

Date Incorporated: _____

Federal ID Number: _____

Number of Years in contracting business under present name: _____

List all other names under which your business has operated in the last 10 years:

_____

_____

Work Presently Under Contract:

Contract Amount $ Completion Date

_____

_____

_____

Type of work performed by your company: _____

Total Staff employed by Firm (Break down by Managers and Trades on separate sheet):

_____

_____

_____

Have you ever failed to complete any work awarded to you? ____ Yes ____ No
(If yes, please attach summary of details on a separate sheet. Include brief explanation of cause and resolution)

Have you ever defaulted on a contract? ____ Yes ____ No
(If yes, please attach summary of details on a separate sheet.)

Has your organization had any disbarments or suspensions that have been imposed in the past five years or that was still in effect during the five year period or is still in effect? ____ Yes ____ No

(If yes, list and explain; such list must include disbarments and suspensions of officers, principals, partners, members, and employees of your organization.)

List the projects most recently completed by your firm (include project of similar importance):

Project Amount $ Mo/Yr Completed

_____
_____
_____

Major equipment available for this contract: _____
_____
_____

Are you in compliance with all applicable EEO requirements? ____ Yes ____ No
(If no, please attach summary of details on a separate sheet.)

Bank References

Address: _____ Contact Name: _____

City & State: _____ Zip: _____ Phone Number: _____

Credit available: $_____

Has the firm or predecessor firm been involved in a bankruptcy or reorganization? ____ Yes ____ No
(If yes, please attach summary of details on a separate sheet.)

List on a sheet attached hereto all judgements, claims, arbitration proceedings, or suits pending or outstanding against bidder over the last five (5) years with amount of claim and brief description.

List on a sheet attached hereto all lawsuits or requested arbitration with regard to construction contracts which bidder has initiated within the last five (5) years and brief explanation of claim and outcome.

Attach resume(s) for the principal member(s) of your organization, including the officers as well as the proposed superintendent for the project.

Signed this day of , 20 .

_____
Signature

_____
Printed Name and Title

_____
Company Name

Notary Statement:

_____, being duly sworn, says that he/she is the _____ Position/Title _____ of _____ (Firm Name), and hereby swears that the answers to the foregoing questions and all statements therein contained are true and correct. He/she hereby authorizes and requests any person, firm, or corporation to furnish any information requested City/County of _____ in verification of the recitals comprising this Statement of Bidder's Qualifications.

Subscribed and sworn before me this _____ day of _____, 20____.

Notary Public

_____
Signature

_____
Printed Name

My Commission Expires: _____

The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.

CONTRACTOR CERTIFICATIONS

U.S. Department of Housing and Urban Development

CERTIFICATION OF BIDDER REGARDING CIVIL RIGHTS LAWS AND REGULATIONS

INSTRUCTIONS

CERTIFICATION OF BIDDER REGARDING Executive Order 11246 and Federal Laws Requiring Federal Contractor to adopt and abide by equal employment opportunity and affirmative action in their hiring, firing, and promotion practices. This includes practices related to race, color, gender, religion, national origin, disability, and veterans' rights.

NAME AND ADDRESS OF BIDDER (include ZIP Code)

CERTIFICATION BY BIDDER

Bidder has participated in a previous contract or subcontract subject to Civil Rights Laws and Regulations.

☐ Yes ☐ No

The undersigned hereby certifies that:

☐ The Provision of Local Training, Employment, and Business Opportunities clause (Section 3 provision) is included in the Contract. A written Section 3 plan (Local Opportunity Plan) was prepared and submitted as part of the bid proceedings (if bid equals or exceeds $100,000).

☐ The Equal Opportunity clause is included in the Contract (if bid equals or exceeds $10,000).

Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended?

☐ Yes ☐ No

NAME AND TITLE OF SIGNER (Please type)

SIGNATURE DATE

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM
CONTRACTOR'S CERTIFICATION

CONCERNING LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS

TO (appropriate recipient)	DATE
	PROJECT NUMBER (if any)
C/O	PROJECT NAME

1. The undersigned, having executed a contract with _____

_____ for the construction of the above-identified project, acknowledges that:

(a) The Labor Standards provisions are included in the aforesaid contract,

(b) Correction of any infractions of the aforesaid conditions, including infractions by any subcontractors and any lower tier subcontractors, is Contractor's responsibility.

2. Certifies that:

(a) Neither Contractor nor any firm, partnership or association in which it has substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5) or pursuant to Section 3(a) of the Davis-Bacon Act, as amended.

(b) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designated as an ineligible contractor pursuant to any of the aforementioned regulatory or statutory provisions.

3. Contractor agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by subcontractors and any lower tier subcontractors, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements executed by the subcontractors.

4. Certifies that:

(a) The legal name and the business address of the undersigned are:

(b) The undersigned is (choose one):

(1) A SINGLE PROPRIETORSHIP	(3) A CORPORATION ORGANIZED IN THE STATE OF
(2) A PARTNERSHIP	(4) OTHER ORGANIZATION (Describe)

(c) The name, title and address of the owner, partners or officers of the undersigned are:

NAME	TITLE	ADDRESS

(d) The names and addresses of all other persons having a substantial interest in the undersigned, and the nature of the interest are:

NAME	ADDRESS	NATURE OF INTEREST

(e) The names, addresses and trade classifications of all other building construction contractors in which the undersigned has a substantial interest are:

NAME	ADDRESS	TRADE CLASSIFICATION

_____
(Contractor)

Date _____

By _____

NONCOLLUSION AFFIDAVIT OF PRIME BIDDER

State of Texas)

County of _____)

_____, being first duly sworn, deposes and says that:

(1) He/She is _____ of _____, the Bidder that has submitted the attached Bid;

(2) He/She is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

(3) Such Bid is genuine and is not a collusive or sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with another Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix an overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the _____ (Local Public Agency) or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) _____

_____
Title

Subscribed and sworn to me this _____ day of _____.

By: _____
Notary Public

My commission expires _____

CONTRACTOR'S CERTIFICATION
of RECOVERED MATERIAL

ACKNOWLEDGEMENT

I, _____ (Principal's Name) of _____ (Company Name) _____ (hereinafter called "Contractor"), acknowledge the recovered material bidding requirements found in 2 CFR 200.322 that requires the Contractor to procure those items designated in the guidelines of the Environmental Protection Agency (EPA) at 40 CFR 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition.

I also acknowledge that this requirement shall apply to items purchased (1) where the Contractor purchases in excess of $10,000 of the item under this contract; or (2) where during the preceding fiscal year, the value of the quantity acquired was in excess of $10,000.

Finally, I acknowledge the attached list of recovered materials included in the bid documents.
(For up-to-date listing, please go to http://www3.epa.gov/epawaste/conserve/tools/cpg/directory.htm)

_____
Printed Name and Title

_____
Signature

_____
Date

USE OF RECOVERED MATERIAL

Please check one:

____ Recovered materials are included in this bid:
Materials included _____
____ Recovered materials are not reasonably available in a reasonable period of time.
____ Recovered materials fail to meet reasonable performance standards, which are determined on the basis of the guidelines of the National Institute of Standards and Technology, if applicable.
____ Recovered materials are only available at an unreasonable price.

_____
Printed Name and Title

_____
Signature

_____
Date

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned, _____ as PRINCIPAL, and _____ as SURETY are held and firmly bound unto (City) hereinafter called the "Local Public Agency", in the penal sum of _____ Dollars, ($_____), lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the Accompanying Bid, dated_____, for _____.

NOW, THEREFORE, the Principal shall not withdraw said Bid within the period specified therein after the opening of the same, or, if no period be specified, within thirty (30) days after the said opening, and shall within the period specified therefor, or if no period be specified, within ten (10) days after the prescribed forms are presented to him for signature, enter into a written contract with the Local Public Agency in accordance with the Bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract; or in the event of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such bond within the time specified, if the Principal shall pay the Local Public Agency the difference between the amount specified in said Bid and the amount for which the local Public Agency may procure the required work or supplies or both, if the latter be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS THEREOF, the above parties have executed this instrument this _____ day of _____, the name and corporate seal of each corporate party being hereto affixed and these present signed by its undersigned representative, pursuant to authority of its governing body.

(SEAL)

_____

(SEAL)

_____

Attest: By: _____

Affix
Corporate
Seal

Attest: By: _____

Affix
Corporate
Seal

Attest: By: _____

Affix
Corporate
Seal

Countersigned

By _____

*Attorney-in-Fact, State of Texas

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the Corporation named as Principal in the bid bond; that _____, who signed the said bond on behalf of the Principal was then _____ of said corporation; that I know his/her signature, and his/her signature thereto is genuine; and that said bond was duly signed, sealed, and attested to, on behalf of said corporation by authority of its governing body.

Corporate
Seal

Title: _____

*Power-of-attorney for person signing for Surety Company must be attached to bond.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that:

_____
(Name of Contractor)

_____
(Address)

a _____, hereinafter called Principal,
(Corporation / Partnership / LLC)

and _____
(Name of Surety Company)

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

City of Socorro, Texas, 124 S. Horizon, Blvd., Socorro, Texas 79927

hereinafter called OWNER, in the penal sum of _____ Dollars, ($_____) in lawful money of the United States, for this payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____ in accordance with the Drawings and Specifications prepared by:

CSA DESIGN GROUP, INC.

which Contract is by reference made a part hereof and incorporated herewith and is hereinafter referred to as the Contract, for the construction of:

SPARKS ARROYO DRAINAGE IMPROVEMENTS

NOW THEREFORE, the condition of this obligation is such that, if the Contractor shall promptly make payments to all claimants as defined in Chapter 2253 of the Texas Government Code, as amended, of all persons supplying labor and materials in the prosecution of the work provided for in said Contract, then this obligation shall be null and void, but otherwise it shall remain in full force and effect.

In the event Contractor fails to promptly pay when due persons who have supplied labor, materials, or supplies used in the performance of the said Contract, Surety will, upon receipt of notice from the City or a claim in the form required by law, satisfy all undisputed balances due, and make arrangements satisfactory to the interested parties to resolve all amounts disputed in good faith, but in no event shall the liability of the Surety for the Contractor's failure to promptly pay for labor, materials, or supplies exceed the penalty of this bond.

The Surety agrees to pay to the City upon demand all loss and expense, including attorney's fees, incurred by the City by reason of or on account of any breach of this agreement by Surety.

Provided further, this bond is made and entered into for the protection of all claimants supplying labor and material in the prosecution of the work provided for in said Contract, and all such claimants shall have a direct right of action under the bond as provided in Chapter 2253, Texas Government Code.

For value received, Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the Contract or to the Drawings and Specifications accompanying the same shall in anywise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counter-parts, each of which shall be deemed an original, this the _____ day of _____.

ATTEST: _____
(Principal)

_____ By _____(s)
(Principal Secretary)

(SEAL)

_____
(Witness as to Principal) (Address)

_____ _____
(Address)

ATTEST: _____
(Surety)

_____ By _____
(Witness as to Surety) (Attorney in Fact)

_____ _____
(Address) (Address)

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that:

_____
(Name of Contractor)

_____
(Address)

_____ hereinafter called Principal, and

_____
(Name of Surety Company)

_____
(Address)

hereinafter called Surety, are held and firmly bound unto the

City of Socorro, Texas, 124 S. Horizon, Blvd., Socorro, Texas 79927

hereinafter called OWNER, in the penal sum of _____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, successors, and assigns, jointly and severally, firmly in these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER dated the _____ day of _____, which Contract is by reference made a part hereof and incorporated herewith and is herein referred to as the "Contract" for the construction of:

SPARKS ARROYO DRAINAGE IMPROVEMENTS

NOW THEREFORE, the condition of this obligation is such that, if the Contractor shall faithfully perform the Contract in accordance with the Plan and Specifications and Contract Documents, and shall fully indemnify and save harmless the City from all cost and damage which the City may suffer by reason of the Contractor's default or failure so to do and shall fully reimburse and repay the City all outlay and expense which the City may incur in making good any default, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

In the event the Contractor is declared in default under the Contract, Surety will within fifteen (15) days of the City's declaration of such default take over and assume completion of said Contract and become entitled to the payment of the balance of the Contract Price. Conditioned upon the Surety's faithful performance of its obligations, the liability of the Surety for the Contractor's default shall not exceed the penalty of this bond.

The Surety agrees to pay to the City upon demand all loss and expense, including attorney's fees, incurred by the City by reason of or on account of any breach of this agreement by Surety.

For value received, Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the Contract or to the Drawings and Specifications accompanying the same shall in anywise

affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition.

Provided further, that if any legal action be filed upon this bond, venue shall lie in El Paso County, State of Texas.

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

ATTEST: _____
(Principal)

_____ By _____(s)
(Principal Secretary)

(SEAL)

_____ _____
(Witness as to Principal) (Address)

_____ _____
(Address)
_____

ATTEST: _____
(Surety)

_____ By _____
(Witness as to Surety) (Attorney in Fact)

_____ _____
(Address) (Address)

NOTE: Date of BOND must not be prior to date of Contract. If PRINCIPAL/CONTRACTOR is Partnership, all partners should execute BOND.

TECHNICAL SPECIFICATIONS

FOR THE

SPARKS ARROYO DRAINAGE CHANNEL IMPROVEMENTS PROJECT

Prepared for:

CITY OF SOCORRO, TEXAS

JULY 2016

Prepared by:

CSA DESIGN GROUP, INC
1845 NORTHWESTERN DRIVE, SUITE C
TEL (915) 877-4155
FAX (915) 877-4334
TEXAS REGISTERED ENGINEERING FIRM F-9997

SPARKS ARROYO DRAINAGE CHANNEL IMPROVEMENTS

TECHNICAL SPECIFICATIONS

INDEX

DIVISION 01

SECTION 01300
MATERIAL APPROVAL SUBMITTAL

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of Contract, including General and Supplementary Conditions apply to this Section.

B. This section includes:
1. Schedule of Submittals
2. Number and type of submittals/resubmittals for shop drawings, product data and samples
3. Contractor and Engineer's responsibilities
4. Distribution

PART 2 SUBMITTALS

2.1 SCHEDULE

A. Schedule submittals to expedite the Project. Coordinate submission of related items. Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for re-submittals. The Owner's Representative reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Submit schedule in duplicate within ten (10) days after effective date of Owner-Contractor Agreement.
1. Submit a bar chart or "time-line" type schedule with separate line for each major section of work or operation. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates.
2. Submit a schedule of shop drawing submissions indicating submittal number, specification section, items covered, date submitted, and action taken by Owner's representatives.

C. Participate in review of schedule jointly with Owner's representative. Reviews shall be limited to verifying that specific activities and dates pertaining to the following have been included:
1. Adequate review times for Owner's Representative to review product data and samples.
2. Dates for Owner occupancy requirements.

D. If required, make necessary revisions to schedule and resubmit within seven days. Submit updated schedules with each Application for Payment, identifying changes since previous version. Indicate percentage of completion of each item of work at each submission. Participate in joint reviews when requested by Owner's Representative. If required, make necessary revisions and resubmit within ten (10) days. Submit updated schedule of shop drawing submissions along with each individual submittal.

E. Prepare the schedule in chronological order.

F. Neither the requirement to submit construction schedules; the authority of the Owner's Representative to review the schedules; or any decision made in good faith by the Owner's Representative to exercise or not exercise such authority; shall give rise to any duty or responsibility of Owner or Owner's Representative to the Contractor, Subcontractor, material and equipment suppliers, their agents or employees, or other persons performing Work.

2.2 SHOP DRAWINGS

A. Submit documentation on materials as may be required by the Contract Documents or the Owner. Review all submittals prior to submission. Submit in a timely manner so as not to delay the project. Allow sufficient time for Project Representative's review and resubmission, if necessary. Include certifications from manufacturer that the product complies with appropriate ASTM Standards.

B. The Contractor shall furnish all required submittals which shall include, but not be limited to, the following tabulation of Contractor submissions.
   1. The Contractor shall prepare and submit five (5) hard copies and electronic files of his shop drawings submissions to the Project Representative for review and approval.
   2. Shop drawings shall be submitted without fail in time to permit correction, resubmission and final approval, as hereinafter specified, without causing any delay in the construction of any work. The Contractor may begin the preparation of shop drawings as soon as possible after signing of the contract. Formal submission of shop drawings will begin after execution of the Contract.

C. Where the nature of the work of the Contract makes it necessary, or where so required by the project representative, Contractor shall submit scale and full size shop drawings of his/her work for the approval of the Project Representative. The shop drawings shall be complete in every detail including provisions required of various trades, connections with other wok, all cutting fitting and drilling required and any and all other necessary information in accordance with usual trade practice as particularly required for any special purposes.

D. Shop Drawings include, but are not limited to, shop drawings, layout and installation drawings in plan and elevation, certified wiring diagrams, interconnecting wiring diagrams, manufacturers data, etc. Contractor shall be responsible for securing all of the information, details, dimensions, drawings, etc., necessary to prepare the Shop Drawings required and necessary under this Contract and to fulfill all other requirements of his Contract. Contractor shall secure such information, details, drawings, etc., from all possible sources including the Contract Drawings, drawings prepared by subcontractors, suppliers, etc.

E. Shop drawings shall accurately and clearly present the following:
   1. All working and installation dimensions.
   2. Arrangement and sectional views.
   3. Units of equipment in the proposed positions for installation, details of required attachments and connections, and dimensioned locations between units and in relation to the structures.
   4. Necessary details and information for making connections between the various trades including, but not limited to, power supplies, controls and interconnecting wiring between units, accessories, appurtenances, etc.

F. Structural and all other layout drawings prepared specifically for the Project shall have a plan scale of not less than ¼ inch equal to 1 foot and they shall be not larger then the size of the Contract Drawings.

G. Where manufacturer's publications in the form of catalogs, brochures, illustrations, compliance certificates, or other data sheets are submitted in lieu of prepared shop drawings, such submissions shall specifically indicate the item fro which approval is requested. Identification of items shall be made in ink, and submissions showing only general information are not acceptable.

2.3 PRODUCT DATA

A. Submit pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification Section and number. Show reference standards; component parts; finishes; dimensions; and required clearances.

B. Submit appropriate range of manufacture's standard finishes except when more restrictive requirements are specified, indicating colors, textures and patterns, for Owner selection.

C. Submit samples to illustrate functional characteristics of products, including parts and attachments.

D. Label each sample with identification required for transmittal letter.

E. Provide field samples of finishes fro Project, at location acceptable to Owner, as required by individual Specifications section. Install each sample complete and finished. Acceptable finishes in place may be retained in completed work.

2.4 RESUBMITTALS

A. Make resubmittals under procedures specified for initial submittals; identify changes made since previous submittal.

2.5 CONTRACTOR REVIEW

A. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, quantities and details, manufacturer's catalog numbers, and conformance of submittal with requirements of contract documents.

B. Coordinate submittals with requirements of work and of contract documents.

C. Sign or initial in a rubber-stamped review block format, each sheet of shop drawing and product data, and each sample label to certify compliance with requirements of Contract Documents. Notify Owner in writing at time of submittal, of any deviation from requirement of contract documents.

D. Do not fabricate products or begin work that requires submittals until return of approved submittal.

E. Contractor's responsibility for errors and omissions in submittals is not relived by Owner's review of submittals.

F. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Owner's review of submittals. Owner or his designated representative will review submittals for general conformance to design intent only.

2.6 ENGINEER REVIEW

A. The Engineering Department will review shop drawings, product data, and samples and return submittals generally within 14 days.

2.7 DISTRIBUTION

A. Duplicate and distribute reproductions of shop drawings, copies of product data, and samples, which bear Engineer stamp of approval, to job site file, Record Documents file, subcontractors, suppliers, and other entities requiring information.

END OF SECTION

SECTION 01304
SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 GENERAL

1.1 GENERAL

A. Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements, all as described in this section.
   1. All Submittals to Engineer shall be submitted through the construction inspector..

B. Related Work:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Individual requirements for submittals also may be described in pertinent sections of these specifications.

C. Work not included:
   1. Unrequired submittals will not be reviewed by the Project Engineer.
   2. The Contractor may requires his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Project Engineer unless specifically called for within the Contract Documents.

PART 2 SUBMITTALS

2.1 SUBMITTALS

A. Make submittals of shop drawings, samples, substitution requests, and other items in accordance with the provisions of this section.

2.2 QUALITY ASSURANCE

A. Coordination of submittals
   1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
   2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
   3. By affixing the Contractor’s signature to each submittal, certify that this coordination has been performed.

PART 3 PRODUCTS

3.1 SHOP DRAWINGS

A. Scale and measurements: Make shop drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the work.

B. Type of Prints required:
   1. Submit shop drawings in the form of blueline or blackline prints, a minimum of five (5) copies. Engineer will retain one copy of each sheet.
   2. Blueprints will not be acceptable.

C. Review comments of the Project Engineer will be shown on the prints provided when it is returned to the Contractor. The Contractor may make and distribute such copies as are required for his purposes.

3.2 MANUFACTURERS' LITERATURE

A. Where contents of submitted literature from manufacturers include data not pertinent to the submittal, clearly show which portions of the contents are being submitted for review.

B. Submit the number of copies which are required to be returned, plus one copy which will be retained by the Project Engineer.

3.3 SAMPLES

A. Provide sample or samples identical to the precise article proposed to be provided. Identify as described under "Identification of Submittals" below.

B. Number of samples Required:
   1. Unless otherwise specified, submit samples in the quantity which is required to be returned, plus one which will be retained by the Project Engineer.
   2. By pre-arrangement in specific cases, a single sample may be submitted for review, and, when approved, be installed in the work at a location agreed upon by the Project Engineer.

3.4 COLORS AND PATTERNS

A. Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Owner for selection.

PART 4 EXECUTION

4.1 IDENTIFICATION OF SUBMITTALS

A. Consecutively number all submittals.

1. When Material is resubmitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
2. On resubmittals, cite the original submittal number for reference.

B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.

C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

D. Submittal Log:
1. Maintain an accurate submittal log for the duration of the work, showing current status of all submittals at all times.
2. Make the submittal log available to the Project Engineer for the Project Engineers review upon request.

4.2 GROUPING OF SUBMITTALS

A. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
1. Partial submittals may be rejected as not complying with the provisions of the contract.
2. The Contractor may be held liable for delays so occasioned.

4.3 TIMING OF SUBMITTIALS

A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.

B. In scheduling, allow at least ten (10) working days for review by the Project Engineer following the Project Engineer’s receipt of the submittal.

END OF SECTION

SECTION 01452
LABORATORY TESTING SERVICES

PART 1 GENERAL

A. An independent testing laboratory will be selected by the City of Socorro to inspect and test the materials and the work for this project.

B. The Owner will pay for all authorized initial testing. The Contractor shall be responsible for the payment of all additional testing when initial tests indicate the work does not meet the requirements of these specifications.

C. Related requirements found in other Sections of these Specifications:

1. Documents affecting work of the Section include, but are not limited to, General Conditions, Special Conditions, and Sections in Divisions 1 through 32 of these Specifications.
2. Inspections and testing required by laws, ordinances, rules, regulations, orders, or approvals of public authorities per the Conditions of this Contract.

D. Employment of the independent laboratory shall in no way relieve the Contractor's obligations to fulfill the work of the Contract.

PART 2 TESTING

2.01 TESTING SCHEDULE

A. Required testing shall include but is not limited to the following:

1. Concrete mix designs: The Contractor shall propose design and furnish representative materials for testing. The Owner will pay for one set of tests for one design for each type of concrete required. The Contractor shall pay for additional tests as required to confirm designs meet criteria specified.

2. Concrete compressive strength at 7 and 28 days. One set of tests shall be required for each 50 cubic yards of concrete, a minimum of one test for each day concrete is placed.

3. Testing for Gradation of Aggregate: Base material shall be tested for gradation at every 1000 tons or less, at source, with a minimum of one gradation test per project.

4. Soil densities within substation & ponding area:

(1) In Embankment or Fill: One per 1,000 square feet on every compacted lift.

(2) One field density test for each 1,000 square feet of original ground surface prior to placing fill or slab construction.

(3) One field density test for each 20 cubic yards of fill placed or each layer of fill for each work area, whichever is the greater number of tests.

(4) One moisture-density curve for each type of material used, as indicted by sieve analysis and plasticity index.

PART 3 & 4 – LABORATORY REQUIREMENTS

3.01 QUALIFICATION OF LABORATORY

A. Meet "Recommended Requirements for Independent Laboratory Qualification" published by The American Council of Independent Laboratories.

B. Meet the basic requirements of ASTM E329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction".

C. Authorized to operate in the State of Texas.

3.02 TESTING EQUIPMENT

A. Testing equipment shall be calibrated at reasonable intervals of devices of accuracy traceable to either:

1. National Bureau of Standards
2. Acceptable values of natural physical constants.

4.01 REQUIREMENTS OF LABORATORY

A. Cooperate with the Contractor and his/her personnel; provide qualified personnel for testing on site after due notice.

B. Perform specified inspections, sampling, and testing of materials and methods of construction:

1. Comply with specified standards
2. Ascertain compliance of materials with requirements of Contract Documents

C. Promptly notify the Project Engineer, Owner, and the Contractor of observed irregularities or deficiencies of work or products.

D. Promptly submit written report of each test and inspection; one copy each to the Project Engineer, one copy to the Contractor, one copy to the City of Socorro, and one copy to be filed with the Record Documents. Each report shall include:

1. Date of issue
2. Project title and number (if applicable)
3. Testing laboratory name, address, and telephone number
4. Name and signature of laboratory inspector
5. Date and time of sampling or inspection

6. Record of temperature and other weather conditions on date of sampling or inspection
7. Date of test or inspection
8. Identification of product and specification section
9. Location of sampling or test
10. Type of inspection or test
11. Results of tests and compliance with the Contract Documents
12. Interpretation of test results, when requested by the Project Engineer

4.02 LIMITATIONS OF AUTHORITY OF THE TESTING LABORATORY

A. The testing laboratory is not authorized to :

1. Release, revoke, alter, or enlarge on the requirements of the Contract Documents.
2. Approve or accept any portion of the work.
3. Perform any duties of the Contractor.
4.

PART 5 – CONTRACTOR'S RESPONSIBILITY

5.01 DUTIES AND RESPONSIBILITIES OF THE CONTRACTOR

A. Cooperate with laboratory personnel and provide access to work.

B. Secure and deliver to laboratory adequate quantities of representative samples of materials proposed for use which require preliminary testing.

C. Provide to laboratory the proposed design mix for concrete and asphalt which require control by testing laboratory.

D. Should the laboratory's tests of the proposed design mixes do not confirm compliance with the requirements of the Contract Documents, the Contractor shall propose a different design mix and shall pay for any additional testing until a proposed mix passes the tests and is approved by the Project Engineer.

E. Furnish copies of products' test reports as required.

F. Furnish incidental labor and facilities as follows:

1. To provide access to work to be tested;
2. To obtain and handle samples at Project Site or at the source of the product to be tested;
3. To facilitate inspections and tests;
4. For storage and curing of test samples as may be required by the testing laboratory.

G. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

H. Pay for all additional inspections, sampling, and testing required when the initial tests indicate that work does not comply with the Contract Documents.

I. Ensure that no work is performed or materials installed without the appropriate laboratory testing.

END OF SECTION

SECTION 01570
TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Related Sections

B. Barriers

C. Water Control

D. Security

E. Dust Control

F. Erosion and Sediment Control

G. Noise Control

H. Pollution Control

1.2 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction area and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way.

C. Provide protection for plant life designated to remain. Replace damaged plant life.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.3 WATER CONTROL

A. Grade site to drain. Maintain excavations free of water.

B. Protect site from puddling running water. Provide water barriers as required to protect site from soil erosion.

1.4 SECURITY

A. Coordinate with Owner’s security program.

1.5 DUST CONTROL

A. Execute work by methods to minimize raising dust from construction operations.

B. Provide positive means to prevent air-borne dust from dispensing into the atmosphere.

1.6 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize amount of bare soil exposed at one time.

C. Provide temporary measures such as berms, dikes, and drains to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. All phases of sedimentation and erosion control shall comply with the U.S. Environmental Protection Agency NPDES Regulations and the state regulations, which require the preparation of a Stormwater Pollution Prevention Plan (SWPPP). The Contractor shall conform to the plans and maintain the SWPPP at all times.

1.7 NOISE CONTROL

A. Provide methods, means and facilities to minimize noise produced by construction operations.

1.8 POLLUTION CONTROL

A. Provide methods, means and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.

B. Comply with all applicable federal, state, and local laws and regulations concerning environmental pollution control and abatement.

END OF SECTION

SECTION 01620

STORAGE AND PROTECTION

PART 1 GENERAL

1.1 SUMMARY

A. Protect products scheduled for use in the work by means including, but not necessarily limited to, those described in this section.

B. Related Work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

PART 2 SUBMITTALS

2.1 QUALITY ASSURANCE

A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

2.2 MANUFACTURERS' RECOMMENDATIONS

A. Except as otherwise approved by the Engineer, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

2.3 PACKAGING

A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
1. Maintain packaged materials with seals unbroken and labels intact until time of use.
2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the owner.

2.4 PROTECTION

A. Protect finished surfaces used as passageways, through which equipment and materials are handled.

B. Provide protection for finished surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.

C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

2.5 REPAIRS AND REPLACEMENTS

A. In event of damage, promptly make replacements and repairs to the approval of the Engineer and at no additional cost to the Owner.

B. Additional time required to secure replacements and to make repairs will not be considered by the Engineer and Owner to justify an extension in the Contract Time of Completion.

END OF SECTION

SECTION 01741

CONSTRUCTION WASTE MANAGEMENT DISPOSAL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Construction waste management plan.
2. Construction waste recycling.
3. Construction waste adaptive reuse.

1.2 PLAN REQUIREMENTS

A. Develop and implement construction waste management plan as approved by Engineer.

B. Intent:
1. Divert construction, demolition, and land-clearing debris from landfill disposal.
2. Redirect recyclable material back to manufacturing process.
3. Generate cost savings or increase minimal additional cost to Project for waste disposal.

1.3 CONSTRUCTION WASTE MANAGEMENT PLAN

A. Construction Waste Landfill Diversion: Minimum 25 percent by weight of construction waste materials for duration of Project through resale, recycling, or adaptive reuse.

B. Implement construction waste management plan at start of construction.

C. Distribute approved construction waste management plan to Subcontractors and others affected by plan requirements.

D. Oversee plan implementation, instruct construction personnel for plan compliance, and document plan results.

1.4 CONSTRUCTION WASTE RECYCLING

A. Use source separation method or comingling method suitable to sorting and processing method of selected recycling center. Dispose non-recyclable trash separately into landfill.

B. Source Separation Method: Recyclable materials separated from trash and sorted into separate bins or containers, identified by waste type, prior to transportation to recycling center.

C. Comingling Method: Recyclable materials separated from trash and placed in unsorted bins or container for sorting at recycling center.

D. Materials suggested for recycling include:
1. Packing materials including paper, cardboard, foam plastic, and sheeting.
2. Recyclable plastics.

3. Organic plant debris.
4. Earth materials.
5. Native stone and granular fill.
6. Asphalt and concrete paving.

1.5 CONSTRUCTION WASTE ADAPTIVE REUSE

A. Arrange with processing facility for salvage of construction material and processing for reuse. Do not reuse construction materials on-Site except as allowed by Engineer.

B. Materials required to be salvaged for reuse include:
1. Street, Traffic Control and Regulatory signage as indicated in plans
2. Fire Hydrants
3. Trees labeled as 'Removed and Reserved' in plans
4. Wrought Iron from Fences
5. Chain Link from Fences

PART 2 EXECUTION

2.1 CONSTRUCTION WASTE COLLECTION

A. Collect construction waste materials in marked bins or containers and arrange for transportation to recycling centers or adaptive salvage and reuse processing facilities.

B. Maintain recycling and adaptive reuse storage and collection area in orderly arrangement with materials separated to eliminate co-mingling of materials required to be delivered separately to waste processing facility.

C. Store construction waste materials to prevent environmental pollution, fire hazards, hazards to persons and property, and contamination of stored materials.

D. Cover construction waste materials subject to disintegration, evaporation, settling, or runoff to prevent polluting air, water, and soil.

2.2 CONSTRUCTION WASTE DISPOSAL

A. Deliver construction waste to waste processing facilities. Obtain receipt for deliveries.

B. Dispose of construction waste not capable of being recycled or adaptively reused by delivery to landfill, incinerator, or other legal disposal facility. Obtain receipt for deliveries.

END OF SECTION

DIVISION 03

SECTION 03101
CONCRETE FORMWORK

PART 1 –GENERAL

1.1 REFERENCE STANDARDS:

A. American Concrete Institute
   1. Recommended practice for concrete formwork (ACI 347).
   2. Formwork for concrete (SP-4)

B. American Iron and Steel Institute: Specification for the design of light gage Cold-Formed steel structural members.

C. American Society for Testing Materials:
   1. Specification for Zinc-Coated (Galvanized) steel sheets of structural quality, coils and cut lengths (ASTM A 446)
   2. Standard specification for performed expansion joint fillers for concrete (Bituminous types) (ASTM D 994)
   3. Standard specifications for preformed expansion joint fillers for concrete paving and structural construction (Non-extruding and resilient Bituminous types) (ASTM D 1751).
   4. Standard specification for preformed expansion joint fillers for concrete paving and structural construction (Non-extruding and resilient Non-bituminous types) (ASTM D 1752).

D. United States Department of Commerce: Commercial standard for polyethylene sheeting (construction, industrial and agricultural application) (CS 238).

E. Douglas fir Plywood Association: Technical data of Douglas fir plywood.

F. United States Department of Commerce:
   1. Product standard for softwood plywood – construction and industrial (PS-1).
   2. Simplified practice recommendation R87-32.

G. Western Wood Products Association: Standard grading rules.

H. Building Research Advisory Board (National Academy of Sciences): Dimensional tolerances for Cast-In-Place Concrete.

I. Latest edition of each above Standard shall apply.

1.2 SUBMITTALS

A. Test results of field cured cylinders for form removal shall be submitted to City Engineering.

1.3 COORDINATION OF WORK

A. All work of this section of the specification shall be coordinated with all other trades of work that are affected to insure that the requirements of the contract documents are complied with.

PART 2 - PRODUCTS

2.1 PLYWOOD FORMS

A. In general, plywood forms shall be used for all formed surfaces. Plywood forms shall be made from plywood sheets of adequate thickness and from sheets as large as possible with smooth even edges. Plywood forms can be made from either new of used, but in good condition, plywood. All plywood shall conform to PS-1 of USDC.

2.2 FORM ACCESSORIES

A. Form accessories to be partially of wholly embedded in the concrete such as ties and hangers, shall be commercially manufactured units. Nonfabricated wire is not acceptable. The portion remaining within the concrete shall leave no metal within one (1) inch of the surface. Spreader cones on ties shall not exceed one (1) inch diameter. No wood form spreaders shall be used. Embedded items which occur at the surface of the concrete shall be galvanized.

2.3 EXPANSION JOINT FILLER

A. Expansion joint filler shall conform to ASTM D 994 or D 1752 for all exterior uses subject to weathering, including where covered by a sealant. Expansion joint filler shall conform to ASTM D 1751 for all interior uses not subject to weathering. Joint material shall extend the full depth of the slab or joint and shall be of the thickness indicated on the drawings. Expansion joint filler shall be Burke No. 236 or approved equal.

2.4 JOINT SEALING COMPOUND

A. Where joints in concrete construction are shown to be sealed, the joint sealing compound shall be a cold-applied two-component polyurethane-base sealant specifically recommended by the manufacturer for use in submerged joints. The handling, mixing and placing of the material and preparation of the joint prior to sealing shall be in strict accordance with the recommendations of the manufacture. A two (2) component epoxy primer suitable for use in submerged joints and compatible with the sealer shall be used on all joints. Compound to be Sikaflex-2c NS/SL or approved equal.

2.5 WATER STOPS

A. Water stops wherever indicated on the drawings shall be extruded virgin Polyvinyl chloride (PVC). Water stops shall be Greenstreak, style 696, PVC ribbed with centerbulb as manufactured by Greenstreak, 3400 Tree Court Industrial Boulevard, St. Louis, Missouri, 63122, (314) 225-9400, or approved equal.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Forms shall conform to the shape, lines and dimensions of the concrete as called for by the drawings. Forms shall be substantial and sufficiently tight to prevent leakage of mortar and braces

or tied together so as to maintain their position and shape to insure safety to workmen and the public.

B. Temporary openings shall be provided to facilitate cleaning and inspection immediately before the placing of concrete.

C. During concrete placing, all shores and reshores shall be continuously checked and adjusted as necessary if any movement has taken place. Shores and reshores shall be securely braced against lateral movement.

D. The general arrangement of forms must be such as will allow their erection in the proper sequence with other construction operations such as the placing of reinforcing and other details of similar general nature.

E. The contractor is responsible for the design, engineering, and construction of all formwork to support all loads required. The contractor shall consider in his formwork design the elastic and plastic deformations of those structural concrete slabs and beams required to support forms for subsequent concrete placing of to support reshores.

F. All form surfaces shall be cleaned before re-use. No damaged forms shall be used. Formwork tolerances shall conform to BRAB (NAS) or ACI 347 requirements, whichever is stricter in the particular instance.

G. Formwork, in general, shall comply with ACI 347. ACI SP-4 shall be used as a guide for all form construction.

3.2 PLYWOOD FORMS

A. Plywood forms shall be installed with closed, flush joints.

B. Plywood shall be sealed against absorption of moisture from the concrete by either a field applied approved sealer or a factory applied non-absorptive liner. All sealing of forms shall be done prior to placing of reinforcing steel. Excess coating material shall not be allowed to stand in puddles in the forms nor allowed to come in contact with concrete against which fresh concrete will be placed or any reinforcing steel. Sealer shall be compatible with final finish requirements.

3.3 EXPANSION AND CONSTRUCTION JOINTS

A. Expansion joints shall be formed as detailed on the Contract Drawings, placed around junctures of concrete slabs and vertical surfaces, and elsewhere as indicated. Fill joints with preformed expansion joint filler for full depth of leave open as detailed, and as required for sealing, caulking, etc.

B. Construction joints shall be formed as detailed, located where shown on the Contract Drawings or as directed by City Engineering, or designated representative. The concrete between construction joints shall be placed in one continuous operation. All steel reinforcing shall run continuous through construction joints. Joints shall be perpendicular to main reinforcement.

3.4 ANCHORS, INSERTS, SLEEVES, ETC.

A. Provide for installation in all formwork of inserts, dovetail anchors for masonry, reglets, Water stops,

sleeves, anchors, bolts, anchor plates and other fastenings devices, as furnished by others and required for attachment of other work. Properly locate in cooperation with other trades and secure in position before concrete in places.

B. Wherever pipes, other than electric conduits one (1) inch or less in size pass through concrete, they shall not be poured in solid. Before concrete is placed, they must be surrounded with a tight metal sleeve providing, after the concrete is placed, at least one-fourth inch clearance all around and in such a position relative to the stress within the concrete element that the strength of that element is not unreasonably impaired and as directed by City Engineer or designated representative. Provide additional reinforcing around the sleeved openings as shown on drawings.

3.5 REMOVAL OF FORMS

A. In no case shall the supporting form of any member be removed in less than one (1) day for footings, columns, piers and walls fourteen (14) days for beams, joists and slabs or until such time as the concrete has attained a minimum strength of 80% of their specified twenty-eight (28) day strength based on field cured test cylinders.

3.6 PLACING OF WATER STOPS

A. If indicated on drawings, water stops shall be installed so as to form a continuous watertight barrier. Each piece of premolded waterstop shall be of maximum practical length in order to minimize the number of joints. Care should be taken to correctly position, adequately support and completely protect Water stops during form construction and reinforcing steel and concrete placement.

B. Joining of PVC water stops at ends by heat-scaling shall be performed in accordance with manufacturer's recommendations.

C. Heat sealed joints shall be completely fused without charring and shall result in smooth transitions with no kinks or warping. All water stops joints shall be reviewed and approved by the Project Engineer prior to placement of concrete. In no case will concrete be placed around Water stops, unless approval has been given to the Contractor's Foreman by the City Engineer or designated representative.

END OF SECTION

SECTION 03201
CONCRETE REINFORCING STEEL

PART 1 GENERAL

1.1 GOVERNING STANDARDS:

A. American Concrete Institute:
   1. Manual of standard practice for detailing reinforced concrete structures (ACI 315).
   2. Building code requirements for reinforced concrete (ACI 318).

B. American Society for Testing Materials:
   1. Specification for deformed billet-steel bars for concrete (ASTM A 615).
   2. Specifications for welded steel wire fabric for concrete reinforcement (ASTM A 185).
   3. Specifications for merchant quality hot-rolled carbon steel bars subject to mechanical property requirements

C. American Welding Society: Recommended practices for welding reinforcing steel, metal inserts and connections in reinforced concrete construction (AWSD 12.1)

D. Concrete Reinforcing Steel Institute: Manual of standard practice.

E. Building Research Advisory Board, (National Academy of Sciences): Dimensional tolerances for Cast-In-Place Concrete.

F. Portland Cement Association (PCA):
   1. Joint design for concrete highway and street pavements

G. Latest Edition of each of the above standards shall apply.

1.2 SHOP DRAWINGS:

A. Shop drawings showing complete bending and placing details of all reinforcing shall be submitted to the Project Engineer for their review. Theses details shall include the diagrammatic elevation of all walls, at a scale sufficiently large to show clearly the position and erection marks of all marginal bars around openings, dowels, splices, etc., for these bars. Shop drawings shall also include complete layout plans for each layer of reinforcing of the structural slabs and beams showing the number, arrangement, spacing, location marking orientation, etc., of all reinforcement required for the layer being described. The ends of all reinforcing bars shall be located by appropriate dimensions in the shop drawings.

PART 2 PRODUCTS

2.1 REINFORCING STEEL BARS

A. Reinforcing steel bars for all concrete construction, shall be deformed bars conforming to ASTM A 615, Grade 60, unless notes otherwise on the drawings.

2.2 LOAD TRANSFER DOWELS

A. Load transfer dowels for all concrete construction shall be round, smooth, straight steel dowel bars conforming to ASTM A 663, Grade 60, unless noted otherwise on the drawings.

2.3 METAL ACCESSORIES

A. Metal accessories, including spacers, chairs, ties, dowels, expansion caps, and other devices necessary for properly spacing, placing, supporting and fastening reinforcement shall be of adequate size and strength and shall be of standard manufacture for the purpose intended. Where the concrete surface will be exposed to the weather in the finished structure the portions of all accessories in contract with the formwork shall be galvanized.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. Detailing fabricating and placing of reinforcement shall be at least the equal of that set forth in the Manual of Standard Practice for detailing reinforced concrete structures published by the American Concrete Institute, and better where required by the drawings and specifications.

B. Fabrication and placing tolerances of reinforcing shall be within the limits listed in the CRSI, Manual of Standard Practice and the BRAB, dimensional tolerances for Cast-In-Place Concrete.

C. Splices shall only be made in accordance with the drawings, or where not shown, at approved places of least weakness and with a lap of at least thirty-two (32) diameters. Horizontal bars shall be bent twelve (12) inches around corners. Separate corner bars which bend around corners a minimum of two feet and zero inches (2'-0") each side may be used.

D. Reinforcement for piers or columns shall not be detailed or fabricated until field measurements of actual footing elevations can be made.

E. Protect all materials, reinforcement and accessories from damage when stored at the project site. Store all materials above and clear of the ground surface.

3.2 FABRICATION

A. Reinforcement shall be carefully formed to the shapes on the drawings.

B. Reinforcement shall not be bent or straightened in a manner which will injure the material. Bars with kinks or bends not shown in the drawings shall not be used. Heating of bars will not be permitted for bending.

3.3 FABRICATION

A. Reinforcement shall be securely fastened into position by metal chairs or spacers, or metal ties, as the case demands, for accurate rigid positioning. In general, reinforcing shall be so placed that it may be walked upon without displacement.

B. Provide beam bar chairs to support reinforcing at the specified clearance in the top and bottom of joist and beams. Provide three (3) spacers for joists and beams whose span is less than ten (10) feet. Add one spacer for each additional five (5) feet or fraction of span.

C. For slabs, chairs shall be continuous type spaced not to exceed four (4) feet for top and bottom of reinforcing. No. 5 support bars with single high chairs at four (4) feet maximum spacing may be used instead of continuous high chairs for top slab reinforcing.

D. Footing reinforcement shall be supported by 3"x3"x3" concrete blocks at four feet and zero inches (4'-0") c.c. maximum each way.

E. Ends of all reinforcing bars, top or bottom, shall be supported within one (1) foot of the ends.

F. Weld wire fabric shall be tied and stayed with #14 wire or other approved means, and firmly supported to maintain it in proper position during concrete-placing operations. All joints and laps shall be of sufficient overlap to develop uniform strength. Laps should be a minimum of six (6) inches. Fabric in slabs on grade shall be supported by concrete blocks at four feet and zero inches (4'-0") c.c. maximum each way at clearance from top surface of slab indicated in the Contract Drawings but not lower than at mid-depth of slab.

G. Placement of all reinforcement is subject to review by the Engineer or designated representative at his discretion before any concrete is placed. No concrete shall be poured without the approval of the Project Engineer or designated representative.

H. Provide expansion cap for each load transfer dowel. The minimum length of the expansion cap shall be the applicable joint width plus half (1/2) inch. Place dowel at pavement slab mid-depth. Dowels shall be greased or approved slip cover material used. If necessary, dowels shall be placed in existing slab by drilling into hardened concrete. After the dowel has been placed on the drilling into hardened concrete. After the dowel has been placed on the drilled concrete, the drilled section will be grouted properly with cement.

3.4 WELDING OF REINFORCEMENT

A. All welding of reinforcement shall be conducted in accordance with the recommended practices of AWS D 12.1. No Welding of reinforcing shall be done without written approval by the City or designated representative.

3.5 CONDITION OF REINFORCEMENT

A. Metal reinforcement, at time concrete is places around it, shall be cleaned of concrete from previous placement, dust, scale, mill scale, oil or other coatings that will destroy or reduce the bond. When there has been a delay in placing concrete, the reinforcing shall be re-inspected and, if necessary, cleaned, relocated and tied, and approved by the Engineer or designated representative before placing concrete.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

This Section specifies cast-in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes. If concrete is supplied by a ready-mix concrete producer, the Contractor shall coordinate the delivery of all off-site produced concrete. Construction shall include the following:

A. Concrete curb and gutter

B. Pedestrian Walks and Ramps.

C. Driveways

D. Miscellaneous Concrete Pads

E. Concrete Flumes

F. Rip-Rap and Mortar

1.3 SUBMITTALS

A. General. Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections. The proposed concrete mix design for each separate class of concrete shall be submitted by the Contractor for review by the Engineer or his/her designated representative.

B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, curing compounds, and others as requested by Engineer.

C. Laboratory test reports for concrete materials and mix design test. Design Mix proportions together with certifications by an independent testing laboratory or by the material manufacturer that proposed grout setting bed for base and bearing plates will reach the specified strength shall be submitted for review by the Engineer or his/her designated representative.

D. Materials certificates in lieu of materials laboratory test reports when permitted by Engineer. Materials certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with or exceeds specified requirements.

1. Expansion joint filler

2. Hot poured sealing compound

3. Reinforcement

4. Curing materials

5. Data and Test Reports:

a. Job-mix formula

b. Source, gradation, liquid limit, plasticity index, percentage of wear, and other tests as specified and in referenced publications.

1.4 QUALITY ASSURANCE

A. Codes and Standards. Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. ACI 318, "Building Code Requirements for Reinforced Concrete."

2. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."

B. Materials and installed work may require testing and retesting at any time during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense.

PART 2 PRODUCTS

2.1 FORM MATERIALS

A. Forms for Exposed Finish Concrete. Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.

B. Forms for Unexposed Finish Concrete. Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

C. Form Coatings. Provide commercial formulation form-coating compounds with a maximum VOC of 350 mg/l that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

D. Form Ties. Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to exposed surface.

E. Provide ties that, when removed, will leave holes not larger than 1-inch diameter in concrete surface.

F. Embedded steel plates, shapes, etc. shall conform to the requirements of ASTM A

36 and shall be galvanized. Coat with "Galvaweld" where galvanizing is damaged, at bends, and welds etc.

2.2 REINFORCING MATERIALS

A. Reinforcing Bars. ASTM A 615, Grade 60, deformed.

B. Steel Wire. ASTM A 82, plain, cold-drawn steel.

C. Welded Wire Fabric. ASTM A 185, welded steel wire fabric.

D. Supports for Reinforcement. Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire-bar-type supports complying with CRSI specifications.

E. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

F. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

2.3 CONCRETE MATERIALS

A. Portland Cement. ASTM C 150, Type I.

B. Use one brand of cement throughout project unless otherwise acceptable to Engineer.

C. Fly Ash. ASTM C 618, Type C or Type F.

D. Normal Weight Aggregates. ASTM C 33 and as herein specified. Provide aggregates from a single source for exposed concrete.

1. Fine aggregate shall consist of natural and/or manufactured sand having hard, strong and durable particles and which conform to the requirements of ASTM C 33.

2. Coarse aggregate shall consist of clean, hard, fine-grained, sound crushed rock or washed gravel which do not contain in excess of five (5) percent by weight of flat, chip-like, thin, elongated, friable or laminated pieces, or more than one (1) percent by weight of shale or cherty material. Any piece having a major dimension in excess of two and one-half (2 1/2) times the average thickness shall be considered to be flat or elongated. Coarse aggregate shall conform to the requirements of ASTM C 33.

E. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.

F. Local aggregates not complying with ASTM C 33 but that special tests or actual service have shown to produce concrete of adequate strength and durability may be used when acceptable to Engineer.

G. Water. Water shall be clean water from the utility company mains, free from acids, alkalis, oils or organic materials and shall be suitable for drinking purposes.

H. Admixtures - General. Provide admixtures for concrete that contain not more than 0.1 percent chloride ions.

I. Air-Entraining Admixture. ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

1. All other admixtures shall conform to ASTM C 494.

- Type A: Water-Reducing
- Type B: Retarding
- Type C: Accelerating
- Type D: Water-Reducing and Retarding
- Type E: Water-Reducing and Accelerating
- Type F: High-Range, Water-Reducing
- Type G: High-Range, Water-Reducing and Retarding

2. Approval of any admixtures is required before use in concrete.

3. No calcium chloride shall be used as an admixture under any circumstances in any concrete in this project.

J. Available Products. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

1. "Air-Tite," Cormix.

2. "Air-Mix" or "Perma-Air," Euclid Chemical Co.

3. "Darex AEA" or "Daravair," W.R. Grace & Co.

4. "MB-VR" or "Micro-Air," Master Builders, Inc.

5. "Sealtight AEA," W.R. Meadows, Inc.

6. "Sika AER," Sika Corp.

K. Water-Reducing Admixture. ASTM C 494, Type A.
Available Products. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

1. "Chemtard," ChemMasters Corp.

2. "PSI N," Cormix.

3. "Eucon WR-75," Euclid Chemical Co.

4. "WRDA," W.R. Grace & Co.

5. "Pozzolith Normal" or "Polyheed," Master Builders, Inc.

6. "Prokrete-N," Prokrete Industries.

7. "Plastocrete 161," Sika Corp.

L. High-Range Water-Reducing Admixture (Super Plasticizer). ASTM C 494, Type F or Type G.
Available Products. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

1. "Super P," Anti-Hydro Co., Inc.

2. "PSI Super," Cormix.

3. "Eucon 37," Euclid Chemical Co.

4. "WRDA 19" or "Daracem," W.R. Grace & Co.

5. "Rheobuild," Master Builders, Inc.

6. "PSP," Prokrete Industries.

7. "Sikament 300," Sika Corp.

M. Water-Reducing, Accelerating Admixture. ASTM C 494, Type E.
Available Products. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

1. "Q-Set," Conspec Marketing & Manufacturing Co.

2. "Gilco Accelerator," Cormix.

3. "Accelguard 80," Euclid Chemical Co.

4. "Daraset," W.R. Grace & Co.

5. "Pozzutec 20," Master Builders, Inc.

N. Water-Reducing, Retarding Admixture. ASTM C 494, Type D.
Available Products. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

1. "PSI-R Plus," Cormix.

2. "Eucon Retarder 75," Euclid Chemical Co.

3. "Daratard-17," W.R. Grace & Co.

4. "Pozzolith R," Master Builders, Inc.

5. "Protard," Prokrete Industries.

6. "Plastiment," Sika Corporation.

2.4 RELATED MATERIALS

A. Absorptive Cover. Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.

B. Moisture-Retaining Cover. One of the following, complying with ASTM C 171.

C. Waterproof paper.

D. Polyethylene film.

E. Polyethylene-coated burlap.

F. Liquid Membrane-Forming Curing Compound. Liquid-type membrane forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.
Available Products. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

1. "A-H 3 Way Sealer," Anti-Hydro Co., Inc.

2. "Spartan-Cote," The Burke Co.

3. "Conspec #1," Conspec Marketing & Mfg. Co.

4. "Hardtop," Cormix.

5. "Day-Chem. Cure and Seal," Dayton Superior Corp.

6. "Eucocure," Euclid Chemical Co.

7. "Horn Clear Seal," A.C. Horn, Inc.

8. "L&M Cure," L & M Construction Chemicals, Inc.

9. "Masterkure," Master Builders, Inc.

10. "CS-309," W.R. Meadows, Inc.

11. "LR-151," Prokrete Industries.

12. "Kure-N-Seal," Sonneborn-Rexnord.

13. "Stontop CS2," Stonhard, Inc.

G. Water-Based Acrylic Membrane Curing Compound.ASTM C 309, Type I, Class B.
Available Products. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

1. "Highseal," Conspec Marketing and Mfg. Co.

2. "Safe Cure and Seal," Dayton Superior Corp.

3. "Aqua-Cure," Euclid Chemical Co.

4. "Dress & Seal #18WB," L&M Construction Chemicals, Inc.

5. "Masterseal W," Master Builders, Inc.

6. "Intex," W.R. Meadows, Inc.

7. "Sika Membrane," Sika Corp.

H. Evaporation Control Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
Available Products Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

1. "Aquafilm," Ardex, Inc.

2. "Eucobar," Euclid Chemical Co.

3. "E-Con," L&M Construction Chemicals, Inc.

4. "Confilm," Master Builders, Inc.

2.5 PROPORTIONING AND DESIGN OF MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

B. Limit use of fly ash to not exceed 25 percent of cement content by weight.

C. Submit written reports to Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed by Engineer.

D. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules.

E. Adjustment to Concrete Mixes. Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Engineer before using in work.

2.6 ADMIXTURES

A. Use water-reducing admixture or high-range water-reducing admixture (Superplasticizer) in concrete as required for placement and workability.

B. Use nonchloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F (10 deg C).

C. Use high-range water-reducing admixture (HRWR) in pumped concrete, concrete for industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water/cement ratios below 0.50.

D. Use air-entraining admixture in all concrete. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within following limits:

E. 6.0 percent 3/4-inch to 1-1/2-inch max. aggregate.

F. Use admixtures for water reduction and set control in strict compliance with manufacturer's directions.

2.7 CONCRETE MIXING

A. Ready-Mix Concrete. Comply with requirements of ASTM C 94, and as specified.

B. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

2.8 QUALITY OF CONCRETE

A. The exact proportions of cement, aggregate and water for each class of concrete shall be determined by an approved independent testing laboratory. Mix design shall be based on the saturated surface dry (SSD) condition of the aggregate. The contractor shall pay for all mix designs.

B. Review by the Engineer or his/her designated representative of mix design submitted does not relieve the contractor of the sole responsibility for each mix design to produce concrete of the strength specified.

PART 3 EXECUTION

3.1 GENERAL.

Coordinate the installation of joint materials with placement of forms and reinforcing steel.

3.2 SUBGRADE PENETRATION

The subgrade shall be constructed, prepared, and finished as specified in applicable sections of these specifications. The complete subgrade shall be tested for grade and cross section with a template. The subgrade shall be maintained in a smooth, compacted condition, in

conformance with the required section and established grade until the succeeding operation has been accomplished.

3.3 FORMS

A. General. Design, erect, support, brace, and maintain formwork to support vertical and lateral, static and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances complying with ACI 347.

B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.

C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.

D. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retighten forms and bracing before concrete placement as required preventing mortar leaks and maintaining proper alignment.

3.4 PLACING REINFORCEMENT

A. General. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports and as herein specified.

B. Avoiding cutting or puncturing vapor retarder during reinforcement placement and concreting operations.

C. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.

D. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Engineer.

E. Place reinforcement to obtain at least minimum coverage's for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

F. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. Construction Joints. Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Engineer.

B. Provide keyways at least 1-1/2 inches deep in construction joints in walls and slabs and between walls and footings. Accepted bulkheads designed for this purpose may be used for slabs.

C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints.

3.6 INSTALLATION OF EMBEDDED ITEMS

A. General. Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached there to.

B. Forms for Slabs. Set edge forms, bulkheads, and intermediate screed strips for slabs to obtain required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting- type screeds.

3.7 PREPARATION OF FORM SURFACES

A. General. Coat contact surfaces of forms with an approved, non-residual, low-VOC, form-coating compound before reinforcement is placed.

B. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

3.8 CONCRETE STORAGE

A. Protect all materials from damage or contamination by water, dirt, or other substances while stored at either the project site or the production site and during delivery.

B. Store all materials above and clear of the ground surface except for aggregate.

C. The method of delivering the aggregates to the work and storing and handling shall be such that the moisture content of the aggregates as they come to the mixer shall not be subjected to frequent or unnecessary changes. Aggregate stockpiles shall be arranged and used in a manner to avoid excessive segregation or contamination with other materials or with other sizes of like aggregates.

3.9 MIXING OF CONCRETE

A. Measuring and mixing of concrete shall be in accordance with the recommended practices of ACI 614 and PCA.

B. All concrete shall be thoroughly mixed in approved batch-mixer conforming to the requirements of the Mixer Manufacturer Bureau of the Associated General Contractor of America.

C. All concrete materials shall be batched by weight. Materials for concrete shall be measured within the following percentages of accuracy:

Cement	1%	Water	1%
Aggregates	2%	Admixtures	3%

D. Fine and coarse aggregates shall be separately measured and the water required by the concrete mix designs shall include the water that is contained in the aggregates. The method used for measuring shall be subject to the approval of the Engineer or his/her designated representative, and shall be such that all mix ingredients can be uniformly and accurately controlled and easily checked. Fine and coarse aggregates shall be measured loose and moist as delivered on the job.

E. Each batch of 2 cubic yards or less shall be mixed for not less than 1 1/2 minutes after all ingredients are in the mixer. Mixing time shall be increased 15 seconds for each additional cubic yard or fraction thereof. Each batch shall be completely discharged before another is mixed.

3.10 TRUCK-MIXED CONCRETE

A. The use of truck-mixed concrete will be permitted if consistent with the general provisions of this Section and ASTM C 94.

B. The mixing time length and the number of revolutions of mixing shall conform to ASTM C 94. Concrete shall be rejected if not placed within 1½ hours after water is first added or if 300 revolutions have taken place, whichever comes first.

C. No water shall be added to any truck-mixed concrete after leaving the batching plant.

3.11 DELIVERY TICKET

A. Duplicate delivery tickets, one for the Contractor and one for the Engineer or his/her designated representative shall be furnished with each load of truck-mixed concrete delivered to the project site.

B. Delivery tickets shall provide the following information:

1. Ticket number
2. Date
3. Name of ready-mixed concrete producer
4. Name or number of plant at which concrete is batched
5. Truck number
6. Contractor's name
7. Job name and location
8. Type of cement used (i.e. I, III, air-entrained, etc.)
9. Class of concrete together with required strength, cement content, maximum size of aggregate and slump
10. Time dispatched from plant, time arrived at job site, time left job site
11. Type, name and amount of admixture, if any
12. Amount of concrete in load in cubic yards
13. Amount of water added at job, if any, with signature of person authorizing the added water.

3.12 CONCRETE PLACEMENT

A. Inspection. Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work.

B. General. Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.

C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete to avoid segregation at its final location.

D. Placing Concrete in Forms. Deposit concrete in forms in horizontal layers not deeper

than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

E. Consolidate placed 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.

F. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

G. Placing Concrete Slabs. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

H. Placing Concrete Curbs and Sidewalks. Concrete shall be placed in the forms in one layer of such thickness that, when compacted and finished it will conform exactly to the cross section as shown. Concrete shall be deposited as near to joints as possible without disturbing them but shall not be dumped onto a joint assembly. After the concrete has been placed in the forms a strike-off guided by the side forms shall be used to bring the surface to the proper section to be compacted. The concrete shall be thoroughly consolidated by tamping and spading, or with approved mechanical finishing equipment, and the surface shall be finished to grade with a wood or metal float.

I. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

J. Bring slab surfaces to correct level with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

K. Maintain reinforcing in proper position during concrete placement.

L. Cold-Weather Placing Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

M. Hot-Weather Placing. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg C). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.

2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

3. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.

4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, when acceptable to Engineer.

3.13 FINISH OF FORMED SURFACES

A. Rough Form Finish. For formed concrete surfaces not exposed to view in the finish work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched and fin and other projections exceeding 1/4 inch in height rubbed down or chipped off.

B. Smooth Form Finish. For formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp proofing, veneer plaster, painting, or other similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.

C. Grout-Cleaned Finish. Provide grout-cleaned finish to scheduled concrete surfaces that have received smooth form finish treatment.

D. Combine one part portland cement to 1-1/2 parts fine sand by volume, and a 50:50 mixture of acrylic or styrene butadiene- based bonding admixture and water to consistency of thick paint. Blend standard portland cement and white portland cement, amounts determined by trial patches, so that final color of dry grout will match adjacent surfaces.

E. Thoroughly wet concrete surfaces, apply grout to coat surfaces, and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

F. Related Unformed Surfaces. At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

G. Concrete Curb Finish. The edges of the top of the curb shall be rounded with an edging tool to a radius of 1/4-inch or as otherwise detailed. The surfaces shall be floated and finished with a smooth wood or metal float until true to grade and section and uniform in textures. The surfaces, while still wet, shall be finished with a bristle type brush with longitudinal strokes. Immediately after removing the front curb form, the face of the curb shall be rubbed with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. The surface, while still wet, shall be brushed in the same manner as the gutter and curb top. Except at grade changes or curves, finished surfaces shall not vary, from the testing edge of a ten-foot straightedge, more than 1/8-inch for gutter and 1/4-inch for top and face of curb. Irregularities exceeding the above shall be removed and reconstructed for the full length between regularly scheduled joints. Any depressions which will not drain shall be corrected. Visible surfaces and edges of finished curb, and combination curb and gutter shall be free of blemishes and form and tool marks, and shall be uniform in color, shape, and appearance.

H. Concrete Walkway Finish. The surfaces shall be finished to grade and cross section with a metal float, troweled smooth and finished with a broom moistened with clear water. Brooming shall be transverse to the line of traffic. All slab edges, including those at formed joints, shall be finished carefully with an edger having a radius of 1/8-inch. Unless otherwise indicated, the transverse joints shall be edged before brooming, and the brooming shall eliminate the flat surface left by the surface face of the edger. Brooming shall be so executed that the corrugation thus produced will be uniform in appearance and not more than 1/16-inch in depth. The completed surface shall be uniform in color and free of surface blemishes and tool marks. The finished surface of the pavement shall not vary more than 3/16-inch when tested with a ten-foot straightedge. The thickness of the pavement shall not vary more than 1/4-inch. Irregularities exceeding the above shall be removed and reconstructed for the full length between regularly scheduled joints.

3.14 MONOLITHIC SLAB FINISHES

A. Float Finish. Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo; and as otherwise indicated.

B. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to tolerances of Ff 18 - Fl 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

C. Trowel Finish. Apply trowel finish to monolithic slab surfaces to be exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system.

D. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of FF 20 - Fl 17. Grind smooth surface defects that would telegraph through applied floor covering system.

E. Trowel and Fine Broom Finish. Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.

F. Nonslip Broom Finish. Apply nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

G. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.

3.15 CONCRETE CURING AND PROTECTION

A. General. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but before power floating and troweling.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting; keep continuously moist for not less than 7 days.

C. Curing Methods. Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.

1. Provide moisture curing by following methods.

2. Keep concrete surface continuously wet by covering with water.

3. Use continuous water-fog spray.

D. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.

E. Provide moisture-cover curing as follows:

Cover concrete surfaces with moisture-retaining cover for curing concrete,

placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

F. Provide curing and sealing compound to exposed interior slabs and to exterior slabs, walks, and curbs as follows:

1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

G. Curing Formed Surfaces. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

H. Curing Unformed Surfaces. Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces, by application of appropriate curing method.

I. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

3.16 REMOVAL OF FORMS

A. General. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days and until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimen’s representative of concrete location or members.

C. Form-facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form-facing material without loosening or disturbing shores and supports.

3.17 REUSE OF FORMS

A. Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form- coating compound as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces except as acceptable to Engineer.

3.18 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. Mix, place, and cure concrete as herein specified, to blend with in- place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. 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.

3.19 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas. Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Engineer.

B. Cut out honeycomb, rock pockets, and voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush- coat the area to be patched with specified bonding agent. Place patching mortar before bonding compound has dried.

C. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

D. Repair of Formed Surfaces. Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Engineer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry-pack mortar, or precast cement cone plugs secured in place with bonding agent.

E. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

F. Repair of Unformed Surfaces. Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having required slope.

G. Repair finished unformed surfaces that contain defects that affect durability of concrete. Surface defects, as such, include crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.

H. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.

I. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with patching compound. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Engineer.

J. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

K. Repair isolated random cracks and single holes not over 1 inch in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry-pack before bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

L. Perform structural repairs with prior approval of Engineer for method and procedure, using specified epoxy adhesive and mortar.

M. Repair methods not specified above may be used, subject to acceptance of Engineer.

3.20 CLEANING

After completion of the curing period, remove the curing material (other than liquid membrane) sweep the concrete clean, and, after removal of all foreign matter from the joints, seal joints as herein specified. Clean the entire concrete of all debris and construction equipment as soon as curing and sealing of joints has been completed.

3.21 FINAL CLEAN-UP

Remove all debris, rubbish and excess material from the site

3.22 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. General. The Owner will employ a testing laboratory to perform tests and to submit test reports.

B. Sampling Fresh Concrete. ASTM C 172, except modified for slump to comply with ASTM C 94.

C. Slump. ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.

D. Air Content. ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.

E. Concrete Temperature. Test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and each time a set of compression test specimens is made.

F. Compression Test Specimen. ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cure test specimens are required.

G. Compressive Strength Tests. ASTM C 39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. more than the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

H. When frequency of testing will provide fewer than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used. When total quantity of a given class of concrete is less than 50 cu. yds., Engineer may waive strength test if adequate evidence of satisfactory strength is provided.

I. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

J. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.

K. Test results will be reported in writing to Engineer, Ready-Mix Producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project ID name and number, date of concrete placement, name of concrete testing service, concrete type/class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day and 28-day tests.

L. Nondestructive Testing. Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

M. Additional Tests. The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Engineer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

Class of Concrete Construction	Minimum Core Test @ 28 Days (psi)	Minimum Lab Test @ 28 Days (psi)	Min. No. Sacks of Cement p/ Cu. Yd.	Maximum Aggregate Size (inches)	Req'd Slump (inches)	Admixture Type	Cement Type
Thrust Blocking	2000	2500	4	1 1/2	4		I
Rip Rap	2000	2500	4	1 1/2	2 1/2		I
Rockwall Foundation	3000	3300	5	1 1/2	5		I
Parkway Structures	3000	3600	5	3/4	3 1/2		I
Drainage Structures (not Direct Traffic)	3000	3600	5 1/2	3/4	5	F or G	I
Machine Laid Curb, Barrier Railing	3000	3600	6	3/4	3 1/2	E	I
Drainage Structures (Direct Traffic)	3000	3600	6	3/4	5	F or G	I
Foundation, Bridge Substructure	3600	4300	6	3/4	5	C	I
Pavement Bus Pads & Slab	4000 (@ 3 Days)	4800 (@ 3 Days)	6	1	3 1/2	Type A Air-Entrained	III
Structural Precast	4000	* As Per PCI MNL 116 *					

END OF SECTION

SECTION 03390

PLACING, FINISHING, AND CONCRETE CURING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes initial and final curing of horizontal and vertical concrete surfaces.

B. Related Sections:
1. Section 03300 - Cast-In-Place Concrete.

1.2 REFERENCES

A. American Concrete Institute (ACI):
1. ACI 301 - Specifications for Structural Concrete.
2. ACI 306 - Recommended Practice for Cold Weather Concrete
3. ACI 318- Recommended Practice for Hot Weather Concrete
4. ACI 308.1 - Standard Specification for Curing Concrete.
5. ACI COMM 609 - Consolidation of Concrete
6. ACI COMM 612 - Curing Concrete
7. ACI 614 - Recommended Practice for Measuring, Mixing and Placing Concrete
8. SP-2 - Manual of Concrete Inspection
9. ACI 504R - Guide to Joint Sealants for Concrete Structures

B. ASTM International:
1. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
2. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
3. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
4. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.

1.3 SUBMITTALS

A. Manufacturer’s literature for membrane-forming compounds for curing and for liquid floor hardners shall be submitted for review by City Engineering or designated representative prior to their use on the project.

B. Manufacturer’s literature, specifications, and technical support data on foundation waterproofing.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301, ACI 302.1 and ACI 318.

B. Perform Work in accordance with the City of Socorro and the Texas Department of Transportation standards.

C. Maintain one (1) copy of each document on site.

1.5 COORDINATION OF WORK

During placing and finishing of concrete (including patching concrete pavement and/or repair and replacement of spalled areas in existing concrete slabs), coordinate all work and trades to insure that the requirements of the Contract Documents are complied with.

PART 2 - PRODUCTS

2.1 MEMBRANE-FORMING COMPOUNDS FOR CURING:

A. Membrane-forming compounds shall conform to the requirements of CRD-C300 except as to pigment and shall include a fugitive dye which shall become inconspicuous as required by ASTM C 309.

B. The membrane-forming compound used shall not be detrimental to the bonding of any finish required on any concrete surface, horizontal or vertical.

PART 3 - EXECUTION

3.1 REVIEW BY CITY ENGINEERING BEFORE CONCRETE PLACEMENT AND REPLACEMENT:

A. Review by City Engineering or designated representative is required of all foundations, forms, reinforcing steel, pipes, conduits, sleeves, inserts and other work required to be built into the concrete before the concrete is placed. Review by City Engineering or designated representative foes not relieve the Contractor from complying with the requirements of the Contract Drawings and Specifications.

B. City Engineering must be notified at least twenty-four (24) hours prior to the placing of any concrete, and the placing of concrete before such notice is given and/or before review by City Engineering or designated representative, is a valid reason for rejecting the concrete so placed.

C. The date of placing of concrete for the different members of the structure shall be marked in ink on a set of drawings that are to be kept on file at the job site until completion of the structure. These drawings shall be returned to City Engineering or designated representative at completion of all concrete placing.

3.2 SETTING OF BASE OR BEARING PLATES:

A. The top of concrete or other bearing surfaces shall be finished to the elevations indicated on the drawings. Embedded items shall be set to the dimensions shown.

B. Base and bearing plates shall then be set and anchored to the proper line and elevation using-steel wedges, shims and/or setting nuts for leveling and plumbing the structural members.

C. Wedge or shims shall not be removed, but where protruding shall be cut flush with the edge of the base or bearing plate.

3.3 PLACING CONCRETE:

A. Placing of concrete shall be in accordance with the recommended practice of ACI 614 and PCA "Design and Control of Concrete Mixtures" and "Patching Concrete Pavement".

B. No concrete shall be placed during rain, sleet or snow. Rain water shall not be allowed to increase the mixing water or to damage finished surfaces.

C. Before any concrete is placed, mixing and conveying equipment shall be well cleaned, formwork completed, the forms of space to be filled with concrete thoroughly cleaned; forms, if not oiled, shall be wet; all reinforcement secured and cleaned; and expansion joint material, waterstops, anchors and other embedded items positioned.

D. Bottom of footings shall be sprinkled sufficiently to eliminate drawing of water from the fresh concrete. The hardened concrete of joints between footings and walls or columns, between walls or columns and beams or floors they support, and other similar joints shall be dampened (but not saturated) immediately prior to placing fresh concrete.

E. Excess form oil shall be wiped off and no oil shall be allowed to coat reinforcing steel to the slightest degree. Any oil used shall be of such quality that later surface treatments specified for concrete will not be injured or prevented from application.

F. Concrete shall be handled as rapidly as practicable from the mixer to the place of final deposit by methods which prevent the separation of loss of ingredients. It shall be deposited as nearly as practicable in its final position to avoid re-handling or flowing.

G. All vertical members shall be filled at least two (2) hours ahead of horizontal members in order to allow the concrete in the vertical members to take its initial settlement. Vertical members shall be filled in one continuous operation, using drop chutes of rubber or metal, if necessary. The concrete shall not be allowed to drop freely more than four (4) feet.

H. Place concrete only when the ambient temperature is at least 40º F. and rising, and will remain above 40º for a period of at least twelve (12) hours. A calibrated thermometer shall be provided at the project site.

I. Place slabs, between construction joints in one operation.

J. Concrete shall be carefully worked around reinforcing, waterstops and other embedded items, along surfaces and into the corners of forms eliminating all air or stone pockets.

K. Place concrete for slabs to required thickness and strike off at designed elevations and contours. After screeding, the concrete surface shall be tamped to force coarse aggregate away from the surface.

L. Concrete shall be consolidated by t he use of vibrators in accordance with ACI 609. Vibration must be by direct action in the concrete and not against forms of reinforcements.

Concrete shall be vibrated until the water shows indications of rising, but not until the water has risen. Vibrators shall not be used to transport concrete laterally within the forms of footings. Vibrators shall have a minimum frequency of 8000 revolutions per minute. Size of vibrator diameter shall be as required by space available between forms and reinforcing, embedded items, etc., and suitable for the

mass thickness of concrete being placed. A spare vibrator shall be kept at the project site during all concrete placement operations.

3.4 PROTECTION AND CURING OF CONCRETE:

A. All concrete placed shall be protected such that the temperature at the surface shall be prevented from going below 55º F. for seventy-two (72) hours after placing and prevented from going below freezing for three (3) days thereafter.

B. The contractor shall submit, for review by City Engineering, the methods proposed for protecting the concrete against low or high temperatures. The Contractor shall adhere to the recommendations for cold or hot weather concreting of ACI 306 and 605, respectively, as to temperature of fresh concrete, heating or cooling of concrete materials, use of accelerators and other admixtures, methods of protection, temperature records, etc.

C. Prevention of loss of moisture from surface of concrete shall be accomplished by keeping surface or forms continuously wet for as long as conditions require. Wet curing shall extend for not less than seven (7) days.

D. Slabs on grade shall be cured either by using liquid membrane-forming compounds conforming to the requirements of CRD-C 300 and ASTM C 309, by using water-proof paper conforming to the requirements of ASTM C 171, or by using a wet covering kept continuously wet, such as cotton mats conforming to the requirements of ASTM 440, or burlap.

E. Whatever curing method is used, it shall be applied immediately after final troweling, floating, or after forms are removed. The curing method used shall be coordinated with the method of protection.

F. Membrane-forming compounds shall be applied as soon as possible after finishing operations. Apply compounds in two (2) coats, the second at right angles to the first.

G. After concrete placement protect concrete during other construction activities as necessary to prevent damage from equipment and personnel movements and from excessive stresses resulting from construction loads.

H. Sand floated finish shall be as follows: the forms shall be removed before the surface has fully hardened. The surface then shall be wet and rubbed with a wood float by a uniform circular motion, with fine sand being rubbed into the surface until the resulting finish is even and uniform in color and texture. This finish shall be used for all wall exposed concrete surfaces.

I. An as-cast finish shall be used for all unexposed concrete surfaces.

J. When required by City Engineering, a broom finish shall be provided on top of slab. Broom finish shall consist of a course and scoured texture as directed by City Engineering by drawing a stiff broom across the concrete surface. This operation shall follow immediately after floating. Tolerances shall be within 1/8 inch to promote the intended drainage.

3.5 REPAIR OF SURFACE DEFECTS:

A. After forms are removed, joint marks, fins, honeycombed areas, bulges, depressions, etc., on all concrete surfaces shall be removed and/or filled, leaving a smooth, dense and true surface.

B. All ties holes and all repairable defective areas shall be patched immediately using non-staining, non-shrink grout with a minimum compressive strength of 6000 psi. The color of the patching grout shall match that of adjacent concrete.

C. Honeycombed areas and other defective concrete shall be removed down to sound concrete as directed by City Engineering before patching. All honeycombed areas shall be shown to City Engineering.

D. All areas to be patched shall be thoroughly cleaned and dampened before patching is begun.

3.6 FINISHING OF FORMED SURFACES:

A. ***Rough Form Finish***: For formed concrete surfaces not exposed-to-view, in the finish work or by other construction, unless otherwise indicated, This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding ¼ inch in height rubbed down or chipped off.

B. ***Smooth Form Finish***: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp proofing, painting or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

C. ***Grout Cleaned Finish***: Provide grout cleaned finish to scheduled concrete surfaces which have received smooth form finish treatment.

- Combine on part Portland cement to 1-1/2 parts fine sand by volume, and mix with water to consistency of thick paint. Proprietary additives may be used at Contractor's option. Blend standard Portland cement and white Portland cement, amounts determined by trial patches, so that final color of dry grout will match adjusted surfaces.

- Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least thirty-six (36) hours after rubbing.

D. ***Related Unformed Surfaces***: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent surfaces, unless otherwise indicated.

3.7 SAWING GREEN CONCRETE:

A. The sawing contractor shall provide sawing equipment adequate in units and power to complete the sawing operation as per plans and specifications. The sawing contractor shall supply, except on very small jobs, at least one standby saw in good working condition. An adequate supply of diamond saw blades shall be maintained on job site.

B. Sawing method – the sawing method shall consist of cutting a groove in the pavement with a power driven concrete saw.

C. Sawed grooves for longitudinal and transverse weakened plane joints shall be cut to a minimum depth of (1/4 thickness of slab divided by 4) and to minimum width of 1/8 inch but in no case shall the width exceed ¼ inch.

D. The exact time of sawing longitudinal and transverse weakened plane joints shall be the sawing contractor's responsibility. Sawing transverse weakened plane joints shall be completed within twenty-four (24) hours following paving. Sawing of longitudinal weakened plane joints shall be completed within forty-eight (48) hours.

E. The sequence of sawing may vary due to climatic conditions. The contractor shall exert all possible effort to prevent volunteer cracking.

F. Transverse contraction and longitudinal contraction joints shall be sawed as shown on the plans. The saw kerf shall be straight and true to the required depth and width. Reference points will be supplied by owner or contracting agency where joints are to be saved. Joints should be flushed immediately after sawing to remove concrete laitance.

G. All joints shall be sawed true to line, with their faces perpendicular to the surface of the pavement. Joints shall not very more than ¼ inch from the true line. Transverse joints in succeeding lines shall be sawed in line matching abutting joints in first lane.

3.8 REPAIR AND SEALING OF CRACKS:

A. Volunteer cracks are all cracks and portions of cracks that are not coincident with constructed joints.

B. All volunteer cracks that occur during the ten (10) calendar days following placement of concrete shall be repaired by injecting the entire length of crack with epoxy under pressure. Volunteer cracks not requiring epoxy injection shall be limited to single, continuous, volunteer cracks without branch or connecting cracks that conform to either conditions described in Section 1. or 2. below.
   1. Begin or end at a longitudinal joint or edge of pavement which are not within five (5) feet at any point along length of crack of a transverse joint or another volunteer crack that has not been injected with epoxy.
   2. Do not begin or end at a longitudinal joint or edge of pavement and are not: (A) Within five (5) feet, at any point along length of crack of any transverse joint; (B) Within one (1) foot at any point along length of crack of any longitudinal joint-edge of alb or other volunteer crack that has not been injected with epoxy.

C. Epoxy injection shall be completed within ninety (90) days after pavement is places. Any accumulations of epoxy in saw cuts shall be removed by re-sawing to the specific depth prior to opening pavement to traffic.

D. Equipment used in sawing operations must meet all OSHA standards and specifications. Gas and air equipment may only be used on outside work areas due to noise and fume pollution, unless vented to the outside.

E. FULL DEPTH PATCHING:
Full depth patching shall be rectangular in shape and conform to the dimensions and typical sections shown on the plans. Patches shall be sawed full depth and replaced on a prepared subgrade to the same thickness as the existing pavement

Provide steel reinforcement similar to that of whole slab replacement as noted on the drawings.

Provide load transfer dowels drilled, grouted and coated as specified.

Texture patched surfaces similar to that of surrounding pavement.

3.9 REPAIR OF SPALLS AT SLABS AND AT JOINTS:

Spalls shall be repaired by shallow saw cutting in a waffle pattern within the damaged area or six (6) inches from the joint or edge of spall, whichever is larger. All unsound concrete should be removed, spall cleaned and patched with specified material and finished to match surface texture of adjacent pavement.

3.10 MONOLITHIC SLAB FINISHES:

A. ***Float Finish***: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-red terrazzo, and as otherwise indicated.

B. ***Trowel Finish***: Apply trowel finish to monolithic slab surfaces to be exposed-to view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint or other thin film finish coating system. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane so that depressions between high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

After floating, begin first trowel finish operation using a power-driven trowel. Begin first troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with a level surface plane so that depressions between high spots do not exceed 1/8 inch under a ten (10) foot straight edge.

C. ***Non-Slip Broom Finish***: Apply non-slip broom finish to sidewalks, exterior concrete platforms, steps and ramps and elsewhere as indicated.

Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with City Engineering.

D. ***Finished Surface of Slabs and Joints***: Faulted joints (longitudinal and transversal) shall be grinded on the high side of the faulted area. A self-propelled diamond bladed grinder shall skim the entire area to provide a uniform appearance and texture at a continuous motion. A vacuum system shall be used for cleanup.
Full depth repair and spall repair shall be completed before grinding operation. Joint sealing shall follow thereafter.

END OF SECTION

DIVISION 31

SECTION 31251
EROSION CONTROL

1. GENERAL

1.1 DESCRIPTION

Refer to NPDES requirements in General Conditions.

1.2 MATERIALS

A. Synthetic filter fabric should be a previous sheet of polypropylene, nylon, and polyester or polyethylene yarn conforming to the requirements in Table 1 below.

TABLE 1 - SYNTHETIC FILTER FABRIC REQUIREMENTS

PHYSICAL PROPERTY	REQUIREMENTS
Filtering Efficiency	75% - 85% (minimum)
Tensile Strength at 20% (maximum elongations)	Standard Strength - 30 lb/linear inch (minimum) Extra Strength - 50 lb/linear inch (minimum)
Slurry Flow Rate	0.3 gal/ft^2/min (minimum)

B. Synthetic filter fabric should contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 to 120 degrees F.

C. Burlap of 10 ounces per square yard of fabric can also be used.

D. The filter fabric should be purchased in a continuous roll to avoid joints.

E. While not required, wire fencing may be used as a backing to reinforce standard strength filter fabric. The wire fence (14 gauge minimum) should be at 22-48 inches should have a maximum mesh spacing of 6 inches.

F. Posts should be 2-4 feet long and should be composed of either 2" x 2-4" pine (or equivalent) or 1.00 to 1.33-lb/linear ft. Steel posts should have projections for fastening wire and fabric to them.

1.3 CONSTRUCTION SPECIFICATIONS

A. The maximum height of the filter fence should range between 18 and 36 inches above the ground surface depending on the amount of upslope ponding expected.

B. Posts should be spaced 8 to 10 feet apart when a wire mesh support fence is used and no more than 6 feet apart when extra strength filter fabric (without a wire fence) is used. The posts should extend 12 to 30 inches into the ground.

C. A trench should be excavated 4 to 8 inches wide and 4 to 12 inches deep along the upslope side of the line of posts.

D. If standard strength filter fabric is to be used, the optional wire mesh support fence may be fastened to the upslope side of the posts using 1 inch heavy duty wire staples, tie wires, or hog rings. Extend the wire mesh support to the bottom of the trench. The filter fabric should then be stapled or wired to the fence, and 8 to 20 inches of the fabric should extend into the trench.

E. Extra strength filter fabric does not require a wire mesh support fence. Staple or wire the filter fabric directly to the posts and extend 8 to 20 inches of the fabric into the trench.

F. Where joints in the fabric are required, the filter cloth should be spliced together only at a support post, with a minimum 6-inch overlap, and securely sealed.

G. Do not attach filter fabric to trees.

H. Backfill the trench with compacted soil or 0.75-inch minimum diameter gravel placed over the filter fabric.

1.4 MAINTENANCE

A. Inspect filter fences daily during periods of prolonged rainfall, immediately after each rainfall event, and weekly during periods of no rainfall. Make any required repairs immediately.

B. Sediment must be removed when it reaches one-third to one-half the height of the filter fence. Take care to avoid damaging the fence during cleanout.

C. Filter fences should not be removed until the upslope area has been permanently stabilized. Any sediment deposits remaining in place after the filter fence has been removed should be dressed to conform with the existing grade, prepared, and seeded.

END OF SECTION

SECTION 31311
ROUGH GRADING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Excavating topsoil.
   2. Excavating subsoil.
   3. Cutting, grading, filling, rough contouring, compacting, and for site structures.

B. Related Sections:
   1. Section 31314 – Imported Fill
   2. Section 31315 – Excavation and Backfill
   3. Section 31316 – Earthwork
   4. Section 31320 – Site Clearing
   5. Section 31231 – Trenching

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Topsoil Fill Type
   1. Basis of Measurement: By square foot to elevations indicated on Drawings.
   2. Basis of Payment: Includes excavating existing soil, supplying soil materials, stockpiling, scarifying substrate surface, placing where required, and compacting.

B. Subsoil Fill Type
   1. Basis of Measurement: By the square foot to elevations indicated on Drawings.
   2. Basis of Payment: Includes excavating existing subsoil, supplying subsoil materials, stockpiling, scarifying substrate surface**,** placing where required, and compacting.

C. Structural Fill Type
   1. Basis of Measurement: By the square foot to elevations indicated on Drawings.
   2. Basis of Payment: Includes excavating existing subsoil, supplying structural fill materials, stockpiling, scarifying substrate surface, placing where required, and compacting.

D. Granular Fill Type
   1. Basis of Measurement: By the square foot to elevations indicated on Drawings.
   2. Basis of Payment: Includes supplying granular fill materials**,** stockpiling, scarifying substrate surface, placing where required, and compacting.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
   1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:
   1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
   2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using

Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

3. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
4. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
5. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
6. ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
7. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head).
8. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
9. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Requirements for submittals.
B. Samples: Submit, in air-tight containers, 10 lb sample of each type of fill to testing laboratory.
C. Materials Source: Submit name of imported materials suppliers.
D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C136, ASTM D2419, and ASTM D2434.
B. Perform Work in accordance with Geotechnical report & Texas Department of Transportation Standards.
C. Maintain one copy of each document on site.

PART 2 PRODUCTS

2.1 MATERIALS

A. Topsoil: Type as specified in the Geotechnical report.
B. Subsoil Fill: Type as specified in the Geotechnical report.
C. Structural Fill: Type as specified in the Geotechnical report.
D. Granular Fill: Type as specified in the Geotechnical report.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify survey bench mark and intended elevations for the Work are as indicated on Drawings.

3.2 PREPARATION

A. Call Local Utility Line Information service not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.
B. Identify required lines, levels, contours, and datum.
C. Notify utility company to remove and relocate utilities.
D. Protect utilities indicated to remain from damage.
E. Protect plant life, lawns, rock outcropping and other features remaining as portion of final landscaping.
F. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, re-landscaped, or re-graded, marked areas, without mixing with foreign materials for use in finish grading.
B. Do not excavate wet topsoil.
C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion.
D. Remove excess topsoil not intended for reuse, from site.

3.4 SUBSOIL EXCAVATION

A. Excavate subsoil from areas to be further excavated, re-landscaped, or re-graded.
B. Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.
C. When excavating through roots, perform Work by hand and cut roots with sharp axe.
D. Remove excess subsoil not intended for reuse, from site.
E. Benching Slopes: Horizontally bench existing slopes greater than **1: 4** to key placed fill material to slope to provide firm bearing.
F. Stability: Replace damaged or displaced subsoil as specified for fill.

3.5 FILLING

A. Fill areas to contours and elevations with unfrozen materials.
B. Place material in continuous layers as follows:
   1. Subsoil Fill: Maximum 12 inches compacted depth.
   2. Structural Fill: Maximum 8 inches compacted depth.
   3. Granular Fill: Maximum 8inches compacted depth.
C. Maintain optimum moisture content of fill materials to attain required compaction density.
D. Slope grade away from building minimum 2 percent slope for minimum distance of 10 ft unless

noted otherwise.

E. Make grade changes gradual. Blend slope into level areas.

F. Install Work in accordance with Texas Department of Transportation standards.

3.6 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation.

3.7 FIELD QUALITY CONTROL

A. Perform laboratory material tests in accordance with ASTM D1557 ASTM D698 AASHTO T180.

B. Perform in place compaction tests in accordance with the following:

1. Density Tests: ASTM D1556, ASTM D2167, or ASTM D2922.
2. Moisture Tests: ASTM D3017.

C. When tests indicate Work does not meet specified requirements, remove Work, replace, and retest.

3.8 SCHEDULES

A. Structural Fill:

1. Fill Type as specified in the Geotechnical report
2. Compact uniformly to minimum 95 percent of maximum density.

B. Topsoil Fill:

1. Fill Type as specified in the Geotechnical report
2. Compact uniformly to minimum 95 percent of maximum density.

END OF SECTION

SECTION 31314

IMPORTED FILL

PART 1 – GENERAL

A. Compacted Fills

1. Unless otherwise specified, the relative compaction of all fills shall be at least 95 percent. Compacted fills shall be constructed of materials in accordance with specifications unless otherwise specified. The work of preparing subgrades, placing fills materials, watering, and compacting shall be performed in the presence of the Engineer.

2. On hill sides and at abutments where the existing natural slope is steeper than 1 vertical in 4 horizontal, the existing ground shall be benched as the fill is brought up in layers. The benches shall be approximately horizontal and shall extend below the surface of the cleared and stripped ground a minimum depth of 2 feet normal to the slope unless otherwise specified.

3. Before placing the materials for the compacted fills, the subgrade therefore shall be moistened, compacted, and scarified in accordance with the requirements hereinafter set forth for subsequent layers of fill. The Engineer may determine the locations at which each load of fill shall be placed in order to obtain the best possible blending of material. The fill material shall be placed in approximately horizontal, evenly distributed layers not exceeding 8-inches in depth, except that where the Contractor clearly demonstrates that can attain the required relative density with the type of equipment being used, a greater lift may be authorized. Unless otherwise permitted by the Engineer, each layer of fill material shall cover the full length and width of the entire area to be filled before the next higher layer of material is placed, and each layer shall be sufficiently scarified, after compaction, to provide bond with succeeding layer. The top surface of each layer shall have sufficient crown to provide adequate drainage for water at all times during the construction period.

4. Before rolling and tamping, sufficient water shall be evenly applied to each layer of loose material so as to provide proper moisture content for satisfactory compaction to the specified relative compaction. The moisture content at the time of compaction shall be subject to the approval of the Engineer. In case any layer of fill shall prove to be too wet to permit the attainment of the specified relative compaction, the compacting work shall be delayed until the material has dried sufficiently to permit the attainment of said relative compaction.

5. After each layer has been spread, worked, and properly moistened, it shall be compacted by approved tamping or sheepsfoot rollers, pneumatic-tired rollers, mechanically operated hand tampers, or other mechanical means acceptable to the Engineer, to such extent as will product the specified relative compaction.

6. Compacted fill which is to become subgrade for concrete structures or other hydraulic structures, shall be overfilled sufficiently to permit the trimming thereof to an even and firm subgrade for the concrete to be placed thereon. Compaction shall be to 95%.

7. Do not backfill against supported and/or unsupported foundation walls.

8. Remove surplus backfill materials from site and dispose of in accordance with local and applicable regulations.

9. In general, all other areas which do not require grading shall be disturbed as little as possible and new graded areas shall be graded to match the existing contours with smooth uniform transitions.

10. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.

11. Smooth the finished surfaces within the specified tolerances.

12. Compact with uniform levels or slopes between points where elevations are shown on the Construction drawings, or between such points and existing grades.

13. Where a change of slope is indicated on the Construction Drawings, construct a rolled transition section having a minimum radius of approximately 8 feet, unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage.

PART 2 - PRODUCTS

A. GENERAL

1. No material greater the 3 inches in any dimension shall be allowed.

2. Soils generated from on site excavation activities should generally be acceptable for reuses as fill provided that they are well graded and free of debris. The following criteria for acceptance of engineered fill materials shall be followed. All engineered fill materials shall be capability class I or II per the U.S. Department of Agriculture Natural Resource Conservation service land capability classification system. Engineered fill materials for site grading and backfill shall be free of any organic or deleterious substance shall not contain rocks, cobbles, boulders, or lumps over 3 inches in greatest dimension. All soils proposed to be used as fill materials shall be classified in accordance with procedures stated in ASTM D2487. The following soils will be considered satisfactory for fill materials when classified as follows or as recommended by the Engineer:

   GW, GP, GC, GM, GP-GC, GP-GM, SW, SC, SM, SC-SM, SP-SC

   Soils will be considered unsatisfactory form fill materials when classified as follows:

   PT, OL, OH, ML, MH, CL, AND CH (or where the liquid limit is greater than 40 and plasticity index is greater than 12)

3. Engineered fill should consist of material with a relatively low plasticity and expansion index (Plasticity Index of less than 12, Expansion Index less than 50, per ASTM D4829, and should be generally free of organic material, clay lumps, debris, and rocks or other materials with a diameter of more than 3 inches. In addition, engineered fill should not contain more than 30 percent fines (material passing the No. 200 sieve).

D. FIELD QUALITY CONTROL

1. Compaction testing will be performed in accordance with ASTM 698, ASTM D1557, ASTM D2922, and ASTM D3017.

2. Frequency and locations of compaction tests are to be specified b the Engineer on-site. A minimum of one compaction test per 400 square feet of disturbed area is to be performed.

3. The contractor's independent firm should evaluate the imported fill materials based on the geotechnical report and all related technical specification prior to their placement.

4. Frequency and locations of engineered fill samples are to be specified by the Engineer on site. A minimum of one sample per 50 cubic yards of engineered fill is to be performed.

5. If tests indicate backfilling and engineered fill work do not meet specified requirements, remove work, replace and retest, at no additional cost to the owner.

E. FILLS SUBJECT TO VEHICULAR TRAFFIC

1. Backfill areas with unfrozen materials to required contours and elevations.

2. Systematically backfill to allow maximum time for natural settlement. Do not back fill over porous, wet, frozen, or spongy subgrade surfaces.

3. Place and compact material in equal continuous layers not exceeding 8 inches un compacted depth. Sufficient passes shall be made to develop a minimum dry density of 95 percent of the modified proctor maximum dry density (ASTM D1557) to a depth of 8 inches below the base of the repair and planned improvement areas.

4. Make gradual grade changes. Blend slope into level areas.

F. CERTIFICATION

1. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Engineer or its representative a written report from an independent laboratory certifying that the compaction requirements have been obtained. State in the report the area of fill, the compaction density obtained, and the type or classification of fill material placed.

END OF SECTION

SECTION 31315
EXCAVATION AND BACKFILL

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment and incidentals required to perform all excavating, backfilling, filling and grading, and disposing of earth materials as shown, specified, and required for construction of structures, manholes, vaults, conduits, pipelines, roads, and other facilities required to complete the Work in every respect.
2. All necessary preparation of subgrade for slabs and pavements is included.
3. All temporary means needed to prevent discharge of sediment to water courses from dewatering systems or erosion are included.
4. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof.

1.2 REFERENCES

B. Standards referenced in this Section are listed below:

1. American Institute of Steel Construction, (AISC):
   a. AISC Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings.
2. American Society for Testing and Materials, (ASTM):
   a. ASTM A 36, Specification for Structural Steel.
   b. ASTM A 328, Specification for Steel Sheet Piling.
   c. ASTM D 422, Method for Particle-Size Analysis of Soils.
   d. ASTM D 427, Test Methods for Shrinkage Factors of Soils by the Mercury Method.
   e. ASTM D 1556, Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
   f. ASTM D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft 16/cu ft) (2,700 KN-m/cum).
   g. ASTM D 2166, Test Method for Unconfined Compressive Strength Of Cohesive Soils.
   h. ASTM D 2922, Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   i. ASTM D 4318, Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
3. Occupational Safety and Health Administration, (OSHA):
   a. OSHA Standard, Title 29, Code of Federal Regulations, Part 1926, Section .650 (Subpart P - Excavations).
4. Uniform Building Code, (UBC).

1.3 QUALITY ASSURANCE

C. Testing Services:

1. General: Testing of materials, testing for moisture content during placement and compaction of fill materials, and of compaction requirements for compliance with technical requirements of these Specifications shall be performed by a testing laboratory furnished by CONTRACTOR.
2. OWNER'S Testing Agency Scope:
   a. Only for Quality Assurance / Quality Control.
3. Authority and Duties of OWNER'S Testing Agency: Technicians representing the testing laboratory shall inspect the materials in the field and perform tests and shall report their findings to the ENGINEER and CONTRACTOR. When the materials furnished or the Work performed fails to fulfill Specification requirements, the technician will direct the attention of the ENGINEER and CONTRACTOR to such failure.
   a. The technician shall not act as foreman or perform other duties for CONTRACTOR. Work will be checked as it progresses, but failure to detect any defective Work or materials shall not in any way prevent later rejection when such defect is discovered, nor shall it obligate the ENGINEER for final acceptance. Technicians are not authorized to revoke, alter, relax, enlarge, or release any requirements of the Contract Documents, nor to approve or accept any portion of the Work.
4. Responsibilities and Duties of CONTRACTOR:
   a. The use of testing services shall in no way relieve CONTRACTOR of the responsibility to furnish materials and construction in full compliance with the Contract Documents.
   b. To facilitate testing services, CONTRACTOR shall:
      1) Secure and deliver to the ENGINEER or to the testing agency, without cost, preliminary representative samples of the materials he proposes to use and which are required to be tested.
      2) Furnish such casual labor as is necessary to obtain and handle samples at the Site or at other sources of material.
      3) Advise the OWNER'S testing agency at least two days in advance of any backfill operations to allow for completion of quality tests and for the assignment of personnel.
   c. CONTRACTOR'S Testing Service shall inspect and approve subgrades and fill layers before further construction Work is performed thereon.
   d. It shall be the responsibility of CONTRACTOR to accomplish the specified compaction for backfill, fill, and other earthwork. It shall be the responsibility of CONTRACTOR to control his operations by confirmation tests to verify and confirm that CONTRACTOR has complied, and is complying at all times, with the requirements of these Specifications concerning compaction, control, and testing.
   e. The frequency of CONTRACTOR'S confirmation tests shall be not less than as follows; each test location for trenches shall include tests for each layer, type, or class of backfill from bedding to finish grade.
      1) Trenches for structures, and underground ductbanks:
         a) In Open Fields: Two locations every 1,000 linear feet.
         b) Along Dirt or Gravel Roads or Off Traveled Right-of-Way: Two locations every 500 linear feet.

c) Crossing Paved Roads: Two locations along each crossing.

d) Under Pavement Cuts or Within Two Feet of Pavement Edges: One location every 400 linear feet.

2) For Structural Backfill: On 30-foot intervals on all sides of the structure for every compacted lift, but no less than one per lift on each side of the structure for structures less than 60 feet long on a side.

3) In Embankment or Fill: One per 1,000 square feet on every compacted lift.

4) Base Material: One per 1,000 square feet on every compacted lift.

f. Copies of the test reports shall be submitted promptly to the ENGINEER. CONTRACTOR'S tests shall be performed by a soils testing laboratory acceptable to the ENGINEER.

g. CONTRACTOR shall demonstrate the adequacy of compaction equipment and procedures before exceeding any of the following amounts of earthwork quantities:

1) 200 linear feet of trench backfill.

2) 10 cubic yards of structural backfill.

3) 100 cubic yards of embankment work.

4) 50 cubic yards of base material.

h. Until the specified degree of compaction on the previously specified amounts of earthwork is achieved, no additional earthwork of the same kind shall be performed.

i. Periodic compliance tests will be made by the ENGINEER to verify that compaction is conforming to the requirements previously specified, at no cost to CONTRACTOR. CONTRACTOR shall remove the overburden above the level at which the ENGINEER wishes to test and shall backfill and recompact the excavation after the test is complete.

j. If compaction fails to conform to the specified requirements, CONTRACTOR shall remove and replace the backfill at proper density or shall bring the density up to specified level by other means acceptable to the ENGINEER. Subsequent tests required to confirm and verify that the reconstructed backfill has been brought up to specified density shall be paid by CONTRACTOR. CONTRACTOR'S confirmation tests shall be performed in a manner acceptable to the ENGINEER. Frequency of confirmation tests for remedial Work shall be double that amount specified for initial confirmation tests.

D. Permits and Regulations:

1. Obtain all necessary permits for work in roads, rights-of-way, railroads, etc. Also, obtain permits as required by local, state and federal agencies for discharging water from excavations.

2. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

1.4 SUBMITTALS

A. Excavation Plan: Prior to start of excavation operations, submit written plan to demonstrate compliance with OSHA Standard 29 CFR Part 1926.650. As a minimum, excavation plan shall include:

1. Name of competent person.

2. Excavation method(s) or protective system(s) to be used.

3. Copies of "manufacturer's data" or other tabulated data if protective system(s) are designed

on the basis of such data.

B. CONTRACTOR shall prepare drawings for the following items:

1. Sheeting and bracing, or other protective system(s).
2. Underpinning.

Drawings shall be prepared by a Registered Professional Engineer recognized as expert in the specialty involved. Drawings shall be submitted to ENGINEER for record purposes only. Calculations shall not be submitted. Drawing submittals will not be checked and will not imply approval by ENGINEER of the Work involved. CONTRACTOR shall be solely responsible for designing, installing, operating and maintaining whatever system is necessary to satisfactorily accomplish all necessary sheeting, bracing, protection, underpinning and dewatering.

1.5 SHOP DRAWINGS: SUBMIT THE FOLLOWING:

1. Sheeting and bracing, or other protective system(s).
2. Underpinning.

Shop Drawings shall be prepared by a Registered Professional Engineer recognized as expert in the specialty involved. Also, submit for approval, calculations and all other pertinent information. CONTRACTOR, however, will be responsible for designing, installing, operating and maintaining the system(s) as required to satisfactorily accomplish all necessary sheeting, bracing, protection, underpinning and dewatering.

1.6 TEST REPORTS - BORROW, BACKFILL AND GRADING:

1. Testing laboratory shall submit copies of the following reports directly to ENGINEER, with copy to CONTRACTOR:
   a. Tests on borrow material.
   b. Tests on footing subgrade.
   c. Field density tests.
   d. Optimum moisture - maximum density curve for each soil used for backfill.
   e. Tests of actual unconfined compressive strength or bearing tests of each strata.

1.7 JOB CONDITIONS

A. Subsurface Information: Refer to Supplementary Conditions for Data on subsurface conditions. Data is not intended as a representation or warranty of continuity of conditions between soil borings nor of groundwater levels at dates and times other than date and time when measured. OWNER will not be responsible for interpretations or conclusions drawn there from by CONTRACTOR. Data is solely made available for the convenience of CONTRACTOR.

1. Additional test borings and other exploratory operations may be made by CONTRACTOR, at no additional cost to the OWNER.

B. Existing Structures: The Drawings show certain surface and underground structures adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of CONTRACTOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected from damage by CONTRACTOR. If they are broken or damaged, they shall be restored immediately by CONTRACTOR at his expense.

C. Existing Utilities: Locate existing underground utilities in the areas of the Work. If utilities are to remain in place, provide adequate means of protection during all operations.
   1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult piping or utility owner and ENGINEER immediately for directions as to procedure. Cooperate with OWNER and utility owner in keeping services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
   2. In general, service lines to individual houses and businesses are not shown; however, CONTRACTOR shall assume that a service exists for each utility to each house or business.

D. Use of Explosives:
   1. The use of explosives will not be permitted.

E. Protection of Persons and Property: Barricade open excavations occurring as part of the Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
   1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

F. Dust Control: Conduct all operations and maintain areas of activity, including watering of operations, sweeping and sprinkling of roadways, to minimize creation and dispersion of dust.

G. Roadways and Walks: Unless otherwise approved by ENGINEER, excavated material and materials of construction shall be so deposited, and the Work shall be so conducted, as to leave open and free for pedestrian traffic all crosswalks, and for vehicular traffic a roadway not less than ten feet in width. All hydrants, valves, fire alarm boxes, letter boxes, and other facilities which may require access during construction shall be kept accessible for use. During the progress of the Work, CONTRACTOR shall maintain such crosswalks, sidewalks, and roadways in satisfactory condition and the Work shall at all times be so conducted as to cause a minimum of inconvenience to public travel, and to permit safe and convenient access to private and public property along the line of the Work.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Backfill and Fill:
   1. Materials acceptable for use as backfill against walls, foundations, underground ductbanks, and other structures shall be stockpiled native sandy clay or granular soils obtained from on-site excavations and which are uniformly mixed, contain no organic matter, nor contain rocks or fragments greater than 4-inches in size, nor have greater than 40 percent passing the 200 sieve. The maximum expansion of on-site materials shall be 1.5 percent as performed on a sample remolded to approximately 95 percent of the maximum dry density as determined in accordance with ASTM D 698 at two percent below optimum moisture content under a 100 psf surcharge pressure.
   2. Backfill and fill materials from off-site sources shall consist of silty or clayey sand soils that are uniformly mixed contain no organic matter. The maximum particle size of imported soils shall be 4-inches or less, if required to satisfy trenching, landscaping, or other requirements. The maximum expansion of off-site materials shall be 1.5 percent as performed on a sample remolded to approximately 95 percent of the maximum dry density as determined in accordance with ASTM D 698 at two percent below optimum moisture content under a 100 psf surcharge pressure.

3. All materials for use as backfill and fill material shall be tested by the laboratory and approved by the ENGINEER.
4. If on-site material is unsuitable as determined by the ENGINEER, select backfill or approved off-site fill shall be used.
5. Fill adjacent to structures is classified as backfill to a distance measured horizontally from the structure that is equal to the depth from the finished grade. Outside these limits the fill is classified as embankments, unless otherwise specified.

B. Select Backfill:

1. Select Backfill for use beneath structures, concrete slabs and asphalt pavements (and where shown or specified below and around structures) shall consist of granular clayey, silty sands or sandy clayey, silty gravel mixtures, free of clay lumps, deleterious materials, organic material, vegetation, cobbles or boulders over 3 inches in nominal size. Select fill should have a liquid limit less than 35 and a plasticity index less than 12. The select fill shall also exhibit an optimum dry density of at least 120 pcf determined in accordance with ASTM D-1557. Select fill soils shall meet the gradation requirements below:

Sieve Sizes (Square Openings)	Percentage by Weight Passing Sieve
1-1/4-inch	100
No. 4	38 to 65
No. 8	25 to 60
No. 30	10 to 40
No. 200	3 to 12

C. Arroyo Slope Select Backfill (ASSB):

1. Arroyo Slope Select Backfill for use beneath concrete channel work within arroyos (and where shown or specified below and around structures) shall be placed in the final 12-inches of the arroyo slopes surface. ASSB shall consist of granular sands which are free of clay lumps, deleterious materials, organic material, vegetation, cobbles or boulders over 4-inches in nominal size and should have a liquid limit less than 40 and a plasticity index of 7 to 15. The ASSB shall also exhibit an optimum dry density of at least 125 pcf determined in accordance with ASTM D-1557. ASSB soils shall meet the gradation requirements below:

Sieve Sizes (Square Openings)	Percentage by Weight Passing Sieve
3-Inch	100
3/4 Inch	70 to 100
No. 4	40 to 100
No. 200	13 to 45

Blending of native soils with imported borrow soils or select fill soils may also be performed provided that these soils meet the specified requirements of ASSB soil materials.

D. Native Select Fill Soils / General Backfill:

1. Native Select Fill soils should only be utilized where approved by the engineer. Native Select Fill soil materials should consist of granular sandy soils or gravel mixtures, free of clay lumps, deleterious materials, organic material, cobbles or boulders over 3 inches in nominal size. The Native Select Fill soils should have a liquid limit less than 40 and a plasticity index less than 15. Native Select Fill soils should meet the gradation requirements below.

Sieve Sizes (Square Openings)	Percentage by Weight Passing Sieve
3-Inch	100
3/4 Inch	70 to 100
No. 4	45 to 100
No. 200	5 to 45

Native Select Fill soils classified in the following list according to the USCS may be considered satisfactory for use: SM, SW, SC, SP-SM, SP-SC, SC-SM, GW, GP, GM, GC, GP-GM and GP-GC, provided that these soils also meet the requirements above.

It is recommended that on-site soils classified as SP be blended with imported low-plasticity clayey sands or as appropriate to mitigate potential soil sloughing during excavations in these types of soils and to create a relatively stable blended soil material that exhibits adequate bearing capacity. The blended soils should meet the requirements of Select Fill above.

Soils classified as CH, CL, MH, ML, OH, OL and PT or a combinations of these under the USCS classification are not considered suitable for use as native Select Fill soils or Structural Fill soil materials.

PART 3 – EXECUTION

3.1 INSPECTION

E. Provide ENGINEER with sufficient notice and with means to examine the areas and conditions under which excavating, filling, and grading are to be performed. ENGINEER will notify CONTRACTOR, in writing, if conditions are found that may be detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 TEST PITS

F. General:

1. CONTRACTOR shall excavate and backfill, in advance of the construction, test pits to determine conditions or location of the existing utilities and structures. CONTRACTOR shall perform all the Work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, backfilling and replacing pavement for the test pits.
   a. CONTRACTOR shall be responsible for the definite location of each existing facility involved within the area of excavation for the Work under this Contract. Care shall be exercised during such location work to avoid damaging and/or disrupting the affected facility. CONTRACTOR shall be responsible for repairing, at his expense, damage to any

structure, piping, or utility caused by his Work.

G. No separate payment will be made for test pits shown.

3.3 EXCAVATION

H. Perform all excavation required to complete the Work as shown, specified and required. Excavations shall include earth, sand, clay, gravel, hardpan, boulders not requiring drilling and blasting for removal, decomposed rock, pavements, rubbish and all other materials within the excavation limits.

I. Excavations for structures shall be open excavations. Provide excavation protection system(s) required by ordinances, codes, law and regulations to prevent injury to workmen and to prevent damage to new and existing structures or pipelines. Unless shown or specified otherwise, protection system(s) shall be utilized under the following conditions.

1. Excavation Less Than Five Feet Deep: Excavations in stable rock or in soil conditions where there is no potential for a cave-in may be made with vertical sides. Under all other conditions, excavations shall be shielded or shored and braced.
2. Excavations Greater Than Five Feet Deep: Excavations in stable rock may be made with vertical sides. Under all other conditions, excavations shall be shielded or shored and braced.
3. Excavation protection system(s) shall be installed and maintained in accordance with drawings submitted under Article 1.4 of this Section.

J. Where the structure is to be placed below the ground water table, well points, cofferdams or other acceptable methods shall be used to permit construction of said structure or pipeline under dry conditions. Dry conditions shall prevail until concrete has reached sufficient strength to withstand earth and hydrostatic loads and until the pipelines are properly jointed, tested and backfilled. In addition, protect excavation from flooding until all walls and floor framing up to and including grade level floors are in place and backfilling has begun. Water level shall be maintained below top of backfill at all times.

K. Pumping of water from excavations shall be done in such a manner to prevent the carrying away of unsolidified concrete materials, and to prevent damage to the existing subgrade.

L. The elevation of the bottom of footings shown shall be considered as approximate only and ENGINEER may direct such changes in dimensions and elevations as may be required to secure a satisfactory footing. All structure excavations shall be hand-trimmed to permit the placing of full widths, and lengths of footings on horizontal beds. Rounded and undercut edges will not be permitted.

M. When excavations are made below the required grades, without the written order of ENGINEER, they shall be backfilled with compacted gravel or concrete, as directed by ENGINEER in writing, at the expense of CONTRACTOR.

N. Excavations shall be extended sufficiently on each side of structures, footings, etc., to permit setting of forms, installation of shoring or bracing or the safe sloping of banks.

O. Subgrades for roadways, structures and trench bottoms shall be firm, dense, and thoroughly compacted and consolidated; shall be free from mud, muck, and other soft or unsuitable materials; and shall remain firm and intact under all construction operations. Subgrades which are otherwise solid, but which become soft or mucky on top due to construction operations, shall be reinforced with crushed stone or gravel. The finished elevation of stabilized subgrades shall not be above subgrade elevations shown.

P. Material Storage: Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.

1. Locate and retain soil materials away from edge of excavations.
2. Dispose of excess soil material and waste materials as specified hereinafter.
3. Stockpiled excavated soils for use as subsequent fill shall be classified by laboratory as on-site granular or sandy clay soils. Use and placement of fill shall be performed as specified for each class.
4. Excess soil from excavations shall be disposed of off-site. Disposal shall be in accordance with state and local regulatory requirements.

Q. Where ENGINEER considers the existing material beneath the bedding material unsuitable, CONTRACTOR shall remove and replace it with select backfill.

3.4 UNAUTHORIZED EXCAVATION

A. All excavation outside the lines and grades shown, and which is not approved by ENGINEER, together with the removal and disposal of the associated material shall be at CONTRACTOR'S expense. Unauthorized excavations shall be filled and compacted with select backfill by CONTRACTOR at his expense.

3.5 EROSION CONTROL, DRAINAGE AND DEWATERING

A. Erosion Control:
1. In general, the construction procedures outlined herein shall be implemented to assure minimum damage to the environment during construction. CONTRACTOR shall take any and all additional measures required to conform to the requirements of applicable codes and regulations, and the requirements specified in the Stormwater Pollution Prevention Plan and Permit.
2. Whenever possible, access and temporary roads shall be located and constructed to avoid environmental damage. Provisions shall be made to regulate drainage, avoid erosion, and minimize damage to vegetation.
3. Where areas must be cleared for storage of materials or temporary structures, provisions shall be made for regulating drainage and controlling erosion, subject to the ENGINEER'S approval.
4. Temporary measures shall be applied to control erosion and to minimize the silting of the existing waterways, and natural ponding areas. Such measures shall include, but are not limited to, the use of berms, baled straw silt barriers, gravel or crushed stone, mulch, slope drains and other methods. These temporary measures shall be applied to erodible materials exposed by any activities associated with the construction of this Work.
    a. Special care shall be taken to eliminate depressions that could serve as mosquito pools.
    b. Temporary measures shall be coordinated with the construction of permanent drainage facilities and other Work to the extent practicable to assure economical, effective, and continuous erosion and silt control.
    c. CONTRACTOR shall provide special care in areas with steep slopes. Disturbance of vegetation shall be kept to a minimum to maintain stability.
5. Remove only those shrubs and grasses that must be removed for construction. Protect the remainder to preserve their erosion-control value.
6. Install erosion and sediment control practices where shown on the Drawings and according to

applicable standards, codes and specifications. The practices shall be maintained in effective working condition during construction and until the drainage area has been permanently stabilized.

7. Mulching shall be used for temporary stabilization.
   a. Suitable Materials for Mulching:
      1) Unrotted Straw or Salt Hay: 1-1/2 to 2 tons/acre.
      2) Asphalt Emulsion or Cutback Asphalt: 600 to 1200 gal./acre.
      3) Wood-fiber or Paper-fiber (hydroseeding): 1500 lbs./acre.
      4) Mulch netting (paper, jute, excelsior, cotton or plastic).
   b. Straw or salt hay mulches should be immediately anchored using peg and twine netting or a mulch anchoring tool or liquid mulch binders.
8. After stabilization, remove all straw bale dikes, debris, etc., from the Site.
9. In the event of any temporary Work stoppage, CONTRACTOR shall take steps any temporary or environmental damage to the area undergoing construction.
10. In the event CONTRACTOR repeatedly fails to satisfactorily control erosion and siltation, the OWNER reserves the right to employ outside assistance or to use its own forces to provide the corrective measures indicated. The cost of such work, plus engineering costs, will be deducted from monies due CONTRACTOR.
11. CONTRACTOR shall prevent blowing and movement of dust from exposed soil surfaces and access roads to reduce on and off-site damage and health hazards. Control may be achieved by irrigation in which the Site shall be sprinkled with water until the surface is moist. The process shall be repeated, as required.

3.6 SHEETING, SHORING AND BRACING

A. General:
   1. Used material shall be in good condition, not damaged or excessively pitted. All steel or wood sheeting designated to remain in place shall be new. New or used sheeting may be used for temporary work.
   2. All timber used for breast boards (lagging) shall be new or used, meeting the requirements for Douglas Fir Dense Construction grade with a bending strength not less than 1500 psi or Southern Pine No. 2 Dense.
   3. All steel work for sheeting, shoring, bracing, cofferdams etc., shall be designed in accordance with the provisions of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", of the AISC, except that field welding will be permitted.
   4. Steel sheet piling shall be manufactured from steel conforming to ASTM A 328. Steel for soldier piles, wales and braces shall be new or used and shall conform to ASTM A 36.
   5. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
   6. Unless otherwise shown, specified, or directed, all materials used for temporary construction shall be removed when Work is completed. Such removal shall be made in a manner not injurious to the structure or its appearance or to adjacent Work.
   7. Provide permanent steel sheet piling or pressure creosoted timber sheet piling wherever subsequent removal of sheet piling might permit lateral movement of soil under adjacent structures. Cut off tops, as required, and leave permanently in place.

8. The clearances and types of the temporary structures, insofar as they affect the character of the finished Work, and the design of sheeting to be left in place, will be subject to the approval of ENGINEER; but CONTRACTOR shall be responsible for the adequacy of all sheeting, shoring, bracing, coffer-damming, etc.
9. Safe and satisfactory sheeting, shoring and bracing shall be the entire responsibility of CONTRACTOR.
10. All municipal, County, State and Federal ordinances, codes, regulations and laws shall be observed.

B. Removal of Sheeting and Bracing:
   1. Remove sheeting and bracing from excavations, unless otherwise directed by ENGINEER, in writing. Removal shall be done so as to not cause injury to the Work. Removal shall be equal on both sides of excavation to ensure no unequal loads on pipe or structure.
   2. Defer removal of sheeting and bracing, where removal may cause soil to come into contact with concrete, until the following conditions are satisfied:
      a. Concrete has cured a minimum of seven days.
      b. Wall and floor framing, up to and including, grade level floors are in place.

3.7 TRENCH SHIELDS

A. Excavation of earth material below the bottom of a shield shall not exceed the limits established by ordinances, codes, laws and regulations.
B. When using a shield for pipe installation:
   1. Any portion of the shield that extends below the mid-diameter of an installed rigid pipe (e.g., PCCP) shall be raised above this point prior to moving the shield ahead for the installation of the next length of pipe.
   2. The bottom of the shield shall not extend below the mid-diameter of installed flexible pipe (e.g., Steel, DI, PVC, etc.) at any time.
C. When using a shield for the installation of structures, the bottom of the shield shall not extend below the top of the bedding for the structures.
D. When a shield is removed or moved ahead, extreme care shall be taken to prevent the movement of pipe or structures or the disturbance of the bedding for pipe or structures. Pipe or structures that are disturbed shall be removed and reinstalled as specified.

3.8 GENERAL REQUIREMENTS FOR BACKFILL AND COMPACTION

A. Furnish, place and compact all select backfill, backfill, fill and other materials required for structures, embankments, pipelines, duct banks and other requirements and required to provide the finished grades as shown and as described herein shall be furnished, placed and compacted by CONTRACTOR.
B. Backfill excavations as promptly as Work permits, but not until completion of the following:
   1. Acceptance by the ENGINEER of construction below finish grade, including damp proofing, waterproofing and perimeter insulation.
   2. Inspection, testing, approval, and recording of locations of underground ductbanks and utilities.
   3. Removal of concrete formwork.
   4. Removal of shoring and backfilling of voids with satisfactory materials.

5. Removal of trash and debris.
6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
7. Placement of settlement plates.

C. Fill containing organic materials or other unacceptable material shall be removed and replaced with approved fill material as specified.

D. Placement of Select Backfill, ASSB, Backfill, and Fill:

1. Select backfill shall be placed to the grades shown. Bring backfill around structures and piping up evenly on all sides. The lift thickness and compaction moisture content range given herein is approximate. These values shall be finally determined from the laboratory test results on the fill materials.
2. All select backfill shall be placed in horizontal loose lifts, not exceeding 8-inches in thickness, and shall be mixed and spread in a manner assuring uniform lift thickness after placing. Each lift shall be compacted by not less than two complete coverages of the specified compactor. Select backfill shall be placed to the underside of all concrete slabs. The fill material shall extend a minimum of two feet outside the face of each structure and be 12-inches below finished grade on all structures. The maximum slope of select backfill to the subgrade shall be one vertical to one horizontal.
3. Backfill and fill around and outside of structures and over select backfill shall be deposited in layers not to exceed 8-inches in un-compacted thickness and mechanically compacted, using platform type tampers. Compaction of structures backfilled by rolling will be permitted provided the desired compaction is obtained and damage to the structure is prevented. Compaction of select backfill and/or backfill by inundation with water will not be permitted. All materials shall be deposited as specified herein and as shown on the Drawings.
4. The material shall be placed at a moisture content and density as specified under Paragraph 3.9.I., below. CONTRACTOR shall provide equipment capable of adding measured amounts of water to the backfill and/or select backfill material to bring it to a condition within the range of the required moisture content. CONTRACTOR shall provide equipment capable of dicing, aerating, and mixing the soil to ensure reasonable uniformity of moisture content throughout the fill material and to reduce the moisture content of the borrow material by air drying, if necessary. If the subgrade or lift of earth material must be moisture conditioned before compaction, the fill material shall be sufficiently mixed or worked on the subgrade to ensure a uniform moisture content throughout the lift of material to be compacted. Materials at moisture content in excess of the specified limit shall be dried by aeration or stockpiled for drying.
5. Keep excavations dry during backfilling operations. No backfill or fill material shall be placed when free water is standing on the surface of the area where the fill is to be placed. No compaction of fill will be permitted with free water on any portion of the fill to be compacted. No fill shall be placed or compacted in a frozen condition or on top of frozen material. Any fill containing organic materials or other unacceptable material previously described shall be removed and replaced with approved fill material prior to compaction.
6. Compaction shall be performed with equipment suitable for the type of fill material being placed. CONTRACTOR shall select equipment that is capable of providing the minimum density required by these Specifications. Hand operated compacting equipment shall be used within a distance of ten feet from the wall of any completed below grade structure. Equipment shall be provided that is capable of compacting in restricted areas next to structures and around piping. The effectiveness of the equipment selected by CONTRACTOR shall be tested at the commencement of compacted fill Work by construction of a small section of fill

within the area where fill is to be placed. If tests on this section of fill show that the specified compaction is not obtained, CONTRACTOR shall increase the amount of coverages, decrease the lift thicknesses or obtain a different type of compactor.

7. Levels of backfill against concrete walls shall not differ by more than two feet on either side of walls, unless walls are adequately braced or all floor framing is in place up to and including grade level slabs. Particular care shall be taken to compact structure backfill, which will be beneath pipes, roads, or other surface construction or structures. In addition, wherever a trench passes through structure backfill, the structure backfill shall be placed and compacted to an elevation 12-inches above the top of the pipe before the trench is excavated. Compacted areas, in each case, shall be adequate to support the item to be constructed or placed thereon.
8. The compaction requirements specified are predicated on the use of normal materials and compaction equipment. In order to establish criteria for the placement of a controlled fill so that it will have compressibility and strength characteristics compatible with the proposed structural loadings, a series of laboratory compaction and/or compressive strength tests shall be performed on the samples of materials submitted by CONTRACTOR. From the results of the laboratory tests, the final values of the required percent compaction, the acceptable compaction moisture content range, and the maximum permissible lift thickness will be established for the fill material and construction equipment proposed.
9. Control the water content of fill material during placement within the range necessary to obtain the compaction specified. In general, the moisture content of the fill shall be within three percent of the optimum moisture content for compaction as determined by laboratory tests. Perform all necessary Work to adjust the water content of the material to within the range necessary to permit the compaction specified. Do not place fill material when free water is standing on the surface of the area where the fill is to be placed. No compaction of fill will be permitted with free water on any portion of the fill to be compacted.
10. Compact fill shall be compacted by at least two coverage's of all portions of the surface of each lift by compaction equipment. One coverage is defined as the condition obtained when all portions of the surface of the fill material have been subjected to the direct contact of the compactor.
11. If the specified densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly functioning compaction equipment, CONTRACTOR shall perform whatever Work is required to provide the required densities. This Work shall include complete removal of unacceptable fill areas, and replacement and re-compaction until acceptable fill is provided, at no additional cost to the OWNER.
12. CONTRACTOR shall repair, at his own expense, any after settlement that occurs. CONTRACTOR shall make all repairs and replacements required within 30 days after notice from ENGINEER or OWNER.

E. Backfill in Pipe Trenches:

1. Place all backfilling in pipe trenches which are below structures, other pipes, or paved areas, in horizontal layers not exceeding 6-inches in depth and thoroughly compact each before the next layer is placed. In other pipe trenches, compacted layers shall be 6-inches up to the pipe center line and 8-inches thereafter.
2. Where pipe is laid in rock excavation, of crushed stone or gravel fill shall be carefully placed and tamped over the rock before the pipe is laid. Depth of crushed stone or gravel shall be at least 6-inches for pipe 24-inches and smaller and 9-inches for pipe 30-inches and larger. After laying pipe, the balance of the backfill shall be placed as described herein.

3. Prior to the installation of pipes which are to be installed in fill sections, place the fill as described herein, until a minimum height of two feet above the soffit of the pipe is reached, unless otherwise required in other Sections. The fill for the trench width shall then be excavated and the pipe installed and backfilled. The remainder of the fill shall then be placed.
4. Pipeline trenches may be backfilled prior to pressure testing, but no structure shall be constructed over any pipeline until it has been tested.
5. All pipe, except plastic pipe, shall be placed on a minimum 6-inch thick layer of granular embedment material. The granular embedment material shall extend 12-inches above the top of the pipe. CPVC, PVC, HDPE pipes and FRP ducts shall be placed on a minimum 6-inch layer of sand. Sand shall extend to 12-inches above top of pipe and to the trench walls on each side of the pie, unless otherwise noted.
6. Embedment materials both below and above the bottom of the pipe, classes of embedment to be used, and placement and compaction of embedment materials shall conform to the following requirements:
    a. Granular embedment shall be spread and the surface graded to provide a uniform and continuous support beneath the pipe at all points between bell holes or pipe joints. It will be permissible to slightly disturb the finished subgrade surface by withdrawal of pipe slings or other lifting tackle. After each pipe has been graded, aligned, placed in final position on the bedding material and shoved home, sufficient pipe embedment material shall be deposited and compacted under and around each side of the pipe and back of the bell or end thereof to hold the pipe in proper position and to maintain alignment during subsequent pipe jointing and embedment operations. Embedment material shall be deposited and compacted uniformly and simultaneously on each side of the pipe to prevent lateral displacement. The embedment material shall then be placed and compacted to an elevation 12-inches above the top of pipe.
    b. Compacted backfill shall be required for the full depth of the trench above the granular pipe embedment material. Where the trench for one pipe passes beneath the trench for another pipe or electrical ductbank, the lower trench shall be compacted to the level of the bottom of the upper trench.
    c. Each layer of embedment material shall be compacted by at least two complete coverages of all portions of the surface of each lift using approved compaction equipment. One coverage is defined as the conditions reached when all portions of the fill lift have been subjected to the direct contact of the compacting surface of the compactor.
    d. The method of compaction and the equipment used shall be appropriate for the material to be compacted and shall not transmit damaging shocks to the pipe.
    e. The degree of compaction required for granular embedment is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 698.

F. Crushed Stone Placement:
    1. Crushed stone shall be placed where shown to the limits shown.
    2. Crushed stone shall be place in hand tamped lifts, not to exceed 6-inches.

G. Sand Placement:
    1. Sand shall be placed as an envelope around PVC and CPVC pipes, FRP ducts and all pipe 2-inches and smaller. Place and compact minimum 6-inches of sand all round pipes, in 6-inch lifts, to a level 6-inches above the top of pipe.

H. Compaction Density Requirements:

1. The degree of compaction required for all types of fills shall be as listed below. Material shall be moistened or aerated as necessary to provide the moisture content that will facilitate obtaining the specified compaction.

Material Thick.(in)	Required Minimum Density-Percent Compaction (ASTM D 698)	*Maximum Uncompacted Lift (inches)
Subgrade and Subbase Fill:		
Below concrete slabs on grade	95	8
Below base of footings or mats, structural slabs and tank floors	95	8
Below asphalt concrete paving	95	12
**Backfill:		
More than five feet below final grade	100	8
Less than five feet below grade	95	8
Select Backfill:		
Below concrete slabs or mats	95	8
Below asphalt paving	100	8
Trench Backfill, below and above ductbanks	95	12
Trench Backfill above pipe	95	12
Granular Pipe Embedment Material	95	6
Sand Embedment Material	95	6

* Where applicable.

** Backfill shall not be used for support of facilities which are susceptible to damage from differential settlement of the fill section relative to walls.

All fill must be wetted and thoroughly mixed to achieve optimum moisture content, ±three percent, with the following exceptions: On-site clayey soils optimum to plus three percent.

Natural undisturbed soils or compacted soil subsequently disturbed or removed by construction operations shall be replaced with materials compacted as specified above.

2. CONTRACTOR'S testing service shall perform tests required to provide data for selection of fill material and control of placement water content.
3. Field density tests, to ensure that the specified density is being obtained, shall be performed by CONTRACTOR'S testing service during each day of compaction Work.
4. If the tests indicate unsatisfactory compaction, CONTRACTOR shall provide the additional compaction necessary to obtain the specified degree of compaction. All additional compaction Work shall be performed by CONTRACTOR, at no additional cost to the OWNER, until the specified compaction is obtained. This Work shall include complete removal of unacceptable (as determined by the ENGINEER) fill areas and replacement and recompaction until acceptable fill is provided.

I. Replacement of Unacceptable Excavated Materials: In cases where over-excavation for the replacement of unacceptable soil materials is required, the excavation shall be backfilled to the required subgrade with select backfill material and thoroughly compacted as specified in Paragraph 3.9.I., above. Sides of the excavation shall be sloped in accordance to the maximum inclinations specified for each structure location.

3.9 GRADING

A. General: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth subgrade surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
   1. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 1-inch above or below the required subgrade elevation.
   2. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 1/2-inch above or below the required subgrade elevation.

B. Grading Surface of Fill Under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2-inch when tested with a ten foot straightedge.

C. Compaction:
   1. After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.10 DISPOSAL OF EXCAVATED MATERIALS

A. Material removed from the excavations which does not conform to the requirements for fill or is in excess of that required for backfill shall be hauled away from the Site by CONTRACTOR and disposed of in compliance with ordinances, codes, laws and regulations, at no additional cost to the OWNER.

3.11 TEMPORARY FENCING

A. Furnish and install a temporary fence surrounding excavations and work area. Fence shall have openings only at vehicular, equipment and worker access points.

B. The fence shall be a snow fence type enclosure, 48-inches high. Fence shall be constructed of vertical hardwood slats measuring 1-1/2 by 1/4-inch interwoven with strands of horizontal wire, or shall be of equivalent plastic construction. Posts shall be of steel, either U, Y, T or channel section, and shall have corrugations, knobs, notches or studs placed and constructed to engage a substantial number of fence line wire in the proper position. Posts shall have tapered anchors weighing 0.67 pounds or more, each firmly attached by means of welding, riveting or clamping. Posts shall have a nominal weight of 1/3 pound per linear foot exclusive of the anchor. Each post shall be furnished with a sufficient number of galvanized wire fasteners or clamps, of not less than 0.120-inch in diameter for attaching fence wire to the post.

3.12 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction: Testing service must inspect and approve subgrades and fill layers before construction Work is performed thereon. Tests of subgrades and fill layers shall be taken as follows:
   1. Foundation Wall Backfill: Take at least two field density tests, at locations and elevations as directed by the ENGINEER.

B. If testing service reports or inspections show subgrade or fills are below specified density, provide additional compaction and testing at no additional cost to the OWNER.

END OF SECTION

SECTION 31320

SITE CLEARING

PART 1 GENERAL

A. Scope of Work:
1. Contractor shall provide all labor, materials, equipment, and incidentals required to perform clearing and grubbing as shown and specified in the Contract Documents.
2. The Work includes removing from the Site and disposing of trees, stumps, brush, roots, shrubs, vegetation, logs, rubbish, and other objectionable material.
3. Pay all costs associated with transporting and disposing of debris resulting from clearing.
4. Limits of Clearing: Clear the areas shown or indicated on the Drawings.

B. Related Sections:
1. Section 31315, Excavation and Backfill
2. Section 31231 Trenching

1.2 QUALITY ASSURANCE

A. Regulatory Requirements:
1. State and local Laws and Regulations applying to the Work under this Section include:
a. City of Socorro
b. State of Texas

1.3 GUARANTEE

A. Contractor shall guarantee that Work performed under this Section will not permanently damage trees, shrubs, turf and plants designated to remain, or other adjacent work or facilities. If damage resulting from Contractor's operations becomes evident during the correction period, Contractor shall replace damaged items at no additional cost to Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PREPARATION

A. Protection:
1. Throughout the Project, protect existing site improvements, including streets, drives, and Underground Facilities to remain (if any), and adjacent property and structures. Repair damage caused by Contractor to original condition or replace in kind, to satisfaction of Engineer, at no additional cost to Owner.
2. Protect trees, shrubs, vegetation, and grassed areas to remain by providing temporary fencing, barricades, wrapping, or other methods shown, specified, or accepted by Engineer. Correct at Contractors expense damage caused by Contractor outside the limits of clearing Work.

3. Do not remove trees without approval of Engineer, unless shown or specified for removal.
4. Do not locate equipment or stockpiles within drip line of trees and vegetation to remain.

B. Site Preparation:
1. Obtain, pay costs associated with, and comply with applicable permits required for clearing Work.
2. Delineation of Clearing Limits:
a. Locate and clearly flag trees and vegetation to remain, and those to be relocated.
b. Provide flagging to delineate limits of areas to be cleared. Review at Site with Engineer before commencing removal of trees and vegetation.
c. Replace flagging that is lost, removed, or destroyed, until clearing Work is complete and Engineer allows removal of flagging.

3. Erosion and Sedimentation Controls:
a. Provide initial erosion and sedimentation controls before commencing clearing Work.

3.2 CLEARING AND GRUBBING

A. Remove and dispose of all trees, shrubs, stumps, roots, and brush within limits of clearing shown or indicated in the Contract Documents, unless otherwise shown or indicated.

B. Provide erosion and sedimentation controls as clearing Work progresses in accordance with the Contract Documents, applicable permits, and authorities having jurisdiction. Following completion of Work, stabilize and restore disturbed areas and remove erosion and sedimentation controls when acceptable to Engineer.

C. Dispose at appropriate off-Site location trees, stumps, and other cleared and grubbed material Do not use cleared or grubbed material as fill, backfill, or in embankments.

D. Do not burn clearing debris at the Site, unless approved by Owner and authorities having jurisdiction. If burning is permitted, comply with requirements of authorities having jurisdiction, Laws and Regulations, and Owner (if burning is at the Site).

E. Trees and shrubs to remain that have been damaged or require trimming shall be treated and repaired under the direction of a qualified arborist, or other professional acceptable to Engineer. Trees and shrubs intended to remain, that are damaged beyond repair or removed, shall be replaced by Contractor at no additional cost to Owner.

F. Control air pollution caused by dust and dirt, and comply with applicable permits, authorities having jurisdiction, and Laws and Regulations

END OF SECTION

SECTION 31371

GEOTEXTILE FILTER FABRIC - PYRAMAT

PART 1 GENERAL

1.1 GENERAL

This section of the specifications covers all of the work required for installing a needle-punched, non woven geo-synthetic fabric. The geotextile filter fabric shall be placed between the subgrade soils and all loose rock rip-rap. It will provide a separation layer that reduces the possibility of subgrade soils migrating into the rock bedding as well as serving as a weed barrier. Geotextile Filter Fabric for this project shall conform to the requirements of this section. The Contractor shall furnish all materials, equipment, tools, labor, superintendence, and incidentals necessary to perform the work in accordance with the drawings and these specifications.

1.2 REFERENCES

A. AASHTO Standards

1. 404

B. American Society for Testing and Materials (ASTM):

1. D4632
2. D4595
3. D4533
4. D4833
5. D6241
6. D4491
7. D4751
8. D4355
9. D5261
10. D5199

1.3 DEFINITIONS

Minimum Average Roll Value (MARV): Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.

1.4 SUBMITTALS

A. Submit the following:

1. Certification: The contractor shall provide to the Engineer a certificate stating the name of the manufacturer, product name, style number, chemical composition of the produce and other pertinent information to fully describe the geosynthetic. The certificate shall state that the geo-synthetic furnished meets MARV requirements of the specification as evaluated under the Manufacturer's quality control program.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Geotextile Filter Fabric labeling, shipment, and storage shall follow ASTM D 4873. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.

B. Each geosynthetic roll shall be wrapped with a material that will protect the geosynthetic form damage due to shipment, water, sunlight, and contaminants

C. Verify that survey benchmark and intended elevations for the Work are as indicated on Project Documents.

PART 2 MATERIALS

2.1 MATERIALS

The needle-punched non-woven geotextile filter fabric composed of 100% polypropylene staple fabrics shall be inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids. Geotextile filter fabric shall be specifically used for subsurface drainage and/or permanent erosion control applications. The geotextile filter fabric shall meet the requirements below:

Property	Numeric Value	Test Method
Grab Tensile Strength, lb.	202 or more	ASTM 4632
Grab Elongation at Break, percent	50 or less	ASTM 4632
Puncture Strength, lb.	78 or more	ASTM 4833
Trapezoidal Tear, lb.	78 or more	ASTM 4533
Apparent Opening Size, mm	0.22 or less	ASTM 4751
Permittivity, sec^{-1}	0.2 or more	ASTM 4491
Mass per Unit Area. $oz./yd.^2$	8 or more	ASTM 5261

All numeric values represent MARV in the specified direction.

PART 3 EXECUTION

3.0 PREPERATION

A. The installation site shall be prepared by clearing, grubbing, and excavation or filling the area to the design grade. This includes removal of topsoil and vegetation.

3.1 INSTALLATION

A. The geotextile filter fabric shall be laid smooth without wrinkles or folds on the prepared subgrade in the direction of water runoff. Adjacent geotextile rolls shall be overlapped by a minimum of 18 inches. On curves, the geosynthetic may be folded or cut to conform to the curves. The fold or overlap shall be in the direction of construction and held in place by pins, staples, or piles of fill or rock. Prior to covering, the geotextile filter fabric shall be inspected by the Engineer to ensure that the geotextile has not been damaged during installation. Damaged geosynthetic, as identified by the Engineer, shall be repaired immediately. Cover the damaged area with a geotextile filter fabric patch which extends and amount equal to the required overlap beyond the damaged area.

END OF SECTION

SECTION 31375
WELDED WIRE GABION

1. SCOPE

1.1. This specification covers gabions and gabion mattresses produced from metallic coated welded wire fabric, and metallic coated wire for spiral binders, lacing wire, and stiffeners used to assemble the product. The metallic coated fabric may be polyvinyl chloride (PVC) coated after fabrication. The spiral binders, lacing wire, and stiffeners may be polyvinyl chloride (PVC) coated after metallic coating. Polyvinyl chloride hereinafter will be designated as PVC.

1.2. Welded wire fabric for gabions and gabion mattresses is produced in five styles, based on kind of coating, as described in Section 4.

1.3. The values stated in inch-pound units are regarded as the standard. The SI values shown in parentheses are provided for information purposes only.

1.4. The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

2. REFERENCED DOCUMENTS

ASTM A 90/A 90 M	-	Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coating
ASTM A 185	-	Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM A 370	-	Mechanical Testing of Steel Products
ASTM A 428	-	Test Method for Weight of Coating on Aluminum Coated Iron and Steel Articles
ASTM A 641	-	Specification for Zinc Coated (Galvanized) Carbon Steel Wire
ASTM A 809	-	Specification for Aluminum Coated (Aluminized) Steel Wire
ASTM A 853	-	Specification for Steel Wire, Carbon, for General Use
ASTM A 856/A 856M	-	Specification for Zinc-5% Aluminum-Mischmetal Alloy-Coated Carbon Steel Wire
ASTM A 902	-	Terminology Relating to Metallic Coated Steel Products
ASTM B 117	-	Standard Practice for Operating Salt Spray (Fog) Testing Apparatus
ASTM D 638	-	Test Method for Tensile Properties of Plastics
ASTM D 746	-	Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
ASTM D 792	-	Test Method for Specific Gravity (Relative Density) and Density of Plastics by Displacement
ASTM D 1242	-	Test Methods for Resistance of Plastic Materials to Abrasion
ASTM D 1499	-	Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Plastics
ASTM D 2240	-	Test Method for Rubber Property-Durometer Hardness
ASTM G 23	-	Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials

3. TERMINOLOGY

3.1. Definitions - Refer to Terminology A 902 for general terminology relating to metallic-coated steel products.

3.2. Descriptions of Terms Specific to this Standard:

3.2.1. Gabion, n—a wire fabric container, uniformly partitioned, of variable size, interconnected with other similar containers and filled with stone at the site of use, to form flexible, permeable, monolithic structures such as retaining walls, sea walls, channel linings, revetments, and weirs for erosion control. Typical gabion sizes are shown in Table 2.

3.2.2. Gabion mattress, n—a gabion with relatively small height in relation to the lateral dimensions, generally used for lining channels. Typical gabion mattress sizes are shown in Table 3.

3.2.3. Lacing wire, n—for gabions and gabion mattresses, a metallic coated steel wire or metallic coated steel wire with PVC coating used to assemble and interconnect empty gabion units, and to close and secure stone filled units, used as an alternate to spiral binders.

3.2.4. Spiral binder, n—for gabions and gabion mattresses, a length of metallic coated steel wire or metallic coated steel wire with PVC coating preformed into a spiral, used to assemble and interconnect empty gabion units, and to close and secure stone filled units, used as an alternate to lacing wire.

3.2.5. Stiffener, n—for gabions, a length of metallic coated steel wire or metallic coated steel wire with PVC coating used for support by forming a diagonal brace across the corners, inside of the gabion container. Stiffeners are produced using lacing wire for on-site applications or shipped preformed using heavier wire gauge as shown in Table I.

3.2.6. Welded wire fabric, n—material composed of a series of longitudinal and transverse steel wires arranged substantially at right angles to each other, and welded together at the points of intersection by electrical resistance welding to form fabricated sheets.

4. CLASSIFICATION

4.1. Welded wire gabions are classified according to the coating as follows:

4.1.1. Style 1 consists of welded wire fabric made from wire which is zinc coated before being welded into fabric. Spiral binders, lacing wire, and stiffeners are produced from zinc-coated wire.

4.1.2. Style 2 consists of welded wire fabric which is made from uncoated wire and the fabric is subsequently zinc coated after fabrication. Spiral binders, lacing wire, and stiffeners are produced from zinc-coated wire.

4.1.3. Style 3 consists of welded wire fabric made from wire which is coated with zinc-5% aluminum-mischmetal alloy (Zn-5Al-MM) before being welded into fabric. Spiral binders, lacing wire, and stiffeners are also produced from zinc-5% aluminum-mischmetal alloy (Zn-5Al-MM).

4.1.4. Style 4 consists of welded wire fabric made from wire which is aluminum coated before being welded into fabric. Spiral binders, lacing wire, and stiffeners are also produced from aluminum coated (Aluminized) wire.

4.1.5. Style 5 consists of welded wire fabric, spiral binders, lacing wire, and stiffeners as Styles 1,

2, 3, or 4, and overcoated with PVC.

5. ORDERING INFORMATION

5.1. Orders for material to this specification should include the following information:

5.1.1. Quantity (number of units) as shown on plan

5.1.2. Gabions or Gabion Mattresses

5.1.2.1. Size (length x width x height)

5.1.3. Style of coating (Section 4). Give the specific style to be furnished, or list all acceptable styles.

5.1.4. ASTM designation and year of issue

5.1.5. Any special requirements (see 8.2.5 and Note 4)

5.1.6. Certification, if required (see 15.1)

6. MATERIAL AND MANUFACTURE

6.1. The wire used in the manufacture of welded wire fabric for use in gabions shall conform to the specification shown in 6.1.1 as appropriate for the style ordered, except the tensile strength shall conform to 7.1. The wire may be produced from any grade of steel listed in ASTM A 853.

6.1.1. Style 1 welded wire fabric shall be manufactured from zinc-coated steel wire conforming to Specification A641. Style 2 welded wire fabric shall be manufactured from uncoated steel wire conforming to ASTM A 853, and the fabric subsequently zinc coated by the hot-dip process. Style 3 welded wire fabric shall be manufactured from Zn-5Al-MM coated steel wire conforming to Specification A 856/A 856M. Style 4 welded wire fabric shall be manufactured from aluminum-coated steel wire conforming to Specification A 809.

6.2. Spiral binders, lacing wire, and stiffeners shall be made of wire having a tensile strength as stated in 7.1, having the same coating material as the welded wire fabric furnished on the order, and conforming to Specification A 641, A 856/A 856M, or A 809, as appropriate.

6.3. Wire for welded wire fabric shall be assembled by automatic machines or other suitable mechanical means which will assure accurate spacing and alignment of all members of the finished fabric. Longitudinal and transverse members of the welded wire fabric shall be connected at every intersection meeting the requirements of Section 7.2 by the process of electric resistance welding, which employs the principle of fusion combined with pressure.

6.4. PVC coating used in the manufacture of PVC coated gabions and gabion mattresses shall conform to the properties described in 8.2 and 8.3. PVC Coated welded wire fabric shall have the PVC coating fused and bonded onto the metallic-coated welded wire fabric after fabrication of mesh. No cutting of the panels closer than ¼" ± " (6 mm ± 3.18 mm) to the weld shall be permitted after fabrication in order to prevent exposure near the welds.

6.5. PVC-coated wire for spiral binders, lacing wire, and stiffeners shall have the PVC coating fused and bonded or extruded and adhered, onto the metallic-coated wire.

6.6. Gabions and gabion mattresses shall be manufactured with all components mechanically connected at the production facility with the exception of the mattress lid which is produced separately from the base. All gabion and gabion mattresses shall be supplied in the collapsed form, either folded and bundled or rolled, for shipping.

7. MECHANICAL PROPERTIES

7.1. Tensile Strength—The tensile strength of the wire used for the welded wire fabric, spiral binders, lacing wire, and stiffeners shall be soft or medium in accordance with the requirements of the specifications ASTM A 641(Style 1), ASTM A 856/A 856M (Style 3), and ASTM A 809 (Style 4) or Hard Drawn in accordance with ASTM A 853 (Style 2). The cross sectional area of the test specimen shall be based on the diameter of the metallic coated wire. All the wires used in the fabrication of gabions and gabion mattresses must use the same temper wire per given order.

7.2. Weld Shear Strength—The minimum average shear value in pounds-force shall be 70% of the breaking strength of the wire or as indicated in the table below, whichever is greater, when tested as described in 13.4 (reference ASTM A 185).

Typical minimum average shear strengths as specified are shown below:

Wire Diameter in. (mm)	Min. Avg. Shear Strength lbs (newtons)	Minimum Shear Strength lbs (newtons)
0.087 (2.2)	292 (1300)	225 (1000)
0.106 (2.7)	472 (2100)	360 (1600)
0.120 (3.05)	584 (2600)	450 (2000)

7.2.1. Conformance to Requirement —The material shall be deemed to conform with the requirements for weld shear strength if the average of the test results of the first four specimens tested complies with the value in 7.2, or if the average of the test results for all welds tested complies with the value in 7.2.

7.3. A.Panel to Panel Joint Strength—The minimum strength of the joined panels, when tested as described in Section 13.5, shall be as follows:

	Exterior Panels lbs per ft (kiloNewtowns per meter)	Diaphragm Panels lbs per ft (kiloNewtowns per meter)
Gabions	1400 (20.4)	600 (8.7)
Gabion Mattresses	600 (8.7)	300 (4.35)

8. PHYSICAL PROPERTIES

8.1. Metallic Coating—The coating weights shall conform to the requirements of Specification A 641 Class 3 for zinc coating (including the zinc coating on the Style 2 fabric) or Specification A 856/A 856M Class 3 for Zn-5Al-MM coating, or Specification A 809 for aluminum coating.

8.2. PVC for Coating—The initial properties of PVC coating material shall have a demonstrated ability to conform to the following requirements:

8.2.1. Specific Gravity —In the range of 1.20 to 1.40, when tested according to Test Method D 792.

8.2.2. Tensile Strength—Not less than 2,275 psi (15.7 MPa), when tested according to Test Method D 638.

8.2.3. Modulus of Elasticity—Not less than 1,980 psi (13.7 MPa) at 100 Strain, when tested according to Test Method D 638.

8.2.4. Hardness—Shore "A" not less than 75, when tested according to Test Method D 2240.

8.2.5. Brittleness Temperature—Not higher than 15°F (-9° C), or lower temperature when specified by the purchaser, when tested according to Test Method D 746.[1]

8.2.6. Resistance to Abrasion—The percentage of the weight loss shall be less than 12%, when tested according to Test Method D 1242, Method B at 200 cycles, CSI-A Abrader Tape, 80 Grit.

8.2.7. Salt Spray Exposure and Ultraviolet Light Exposure.

8.2.7.1. The PVC shall show no effect after 3,000 hours of salt spray exposure according to Standard Practice B 117.

8.2.7.2. The PVC shall show no effect of exposure to ultraviolet light with test exposure of 3,000 hours, using apparatus Type E and 63° C, when tested according to Practice D 1499 and Practice G 23.

8.2.7.3. Evaluation of Coating After Salt Spray and Ultraviolet Exposure Test—After the salt spray test and exposure to ultraviolet light as specified above, PVC coating shall not show cracks, blister, split, nor noticeable change of color. In addition, the specific gravity, tensile strength, modulus of elasticity and resistance to abrasion shall not change more than 6%, 25%, 25%, and 10% respectively from their initial values.

8.3. PVC Coating on Wire—The initial properties of the PVC coating on the wire and welded wire fabric shall have a demonstrated ability to conform to the following requirements:

8.3.1. Adhesion—The PVC coating shall adhere to the wire such that the coating breaks rather than separates from the wire when tested as described in 13.3.

8.3.2. Mandrel Bend—PVC coated wire when subjected to a single 360° bend at -0° F (-18°C) around a mandrel ten times the diameter of the wire, shall not exhibit breaks or cracks in the PVC coating.

9. DIMENSIONS AND TOLERANCES

9.1. The diameter of metallic coated wire shall conform to Table 1.

9.2. The minimum thickness of the PVC coating and the wire shall be as shown in Table 1.

9.3. Gabions shall have a mesh opening of 3 in. X 3 in. (76 mm X 76 mm). Gabion mattresses shall have a mesh opening of 1½ in. X 3 in. (38 mm X 76 mm). Mesh opening shall be considered to be center-to-center distance between two consecutive longitudinal or transverse wires. The permissible tolerance is ± 1/8 in. (3.2 mm) maximum.

9.4. Spiral binders shall have the maximum inside diameter of 2½" (63.5 mm) and a maximum pitch of 3" (76.2 mm).

9.5. The width, height, and length of the gabion as assembled shall not differ more than ± 5 % from the ordered size prior to filling.

9.6. The width and length of the gabion mattress as assembled shall not differ more than ± 5 % and the height shall not differ more than ± 10 % from the ordered size prior to filling.

10. WORKMANSHIP

10.1. Wire of proper grade and quality, when fabricated in the manner herein required, shall result in a strong, serviceable mesh-type product having substantially square or rectangular openings. It shall be fabricated and finished in a workmanlike manner, as determined by visual inspection and shall conform to this specification.

11. SAMPLING

11.1. Samples for determining the mechanical and physical properties of welded wire fabric shall be obtained by cutting from the finished fabric a full width section of sufficient length to perform the testing. Samples for determining the mechanical and physical properties of coated wire used for spiral binders, lacing wire, and stiffeners shall be selected at random in sufficient number to perform the testing.

12. NUMBER OF TESTS

12.1. Perform a minimum of four tests for conformance to tensile strength of metallic coated wire, weld shear strength, wire and fabric dimensions, metallic coating weight, PVC coating thickness, adhesion of PVC coating, and mandrel bend from each 200,000 sq. ft. (19,000 sq. m.) of fabric or remaining fraction thereof. Perform a minimum of four tests for conformance to tensile strength, wire dimensions, coating weight, PVC coating thickness, adhesion of PVC coating, and mandrel bend from the wire accessories used with each 200,000 sq ft (19,000 sq m) of fabric. Lot will be acceptable if the results of all four tests conform to the requirements.

13. TEST METHODS

13.1. Metallic Coating Weight—Perform coating weight tests as prescribed in Test Methods A 90/A 90M or A 428 as applicable. For coating weight tests on wire of the welded wire fabric, secure multiple lengths between welds, including both longitudinal and transverse wire, cut no closer than 1/4 in. (6.4 mm) from any weld. The combined length shall be 12 in. (305 mm) minimum, but preferably about 24 in. (610 mm).

13.2. PVC Coating Thickness:

13.2.1. The thickness of the PVC coating shall be determined on an individual piece of wire removed from the fabric.

13.2.2. Determine the diameter of the metallic coated wire after stripping the PVC coating by chemical means. Determine the thickness of the PVC coating by scraping the coating from one side of the wire and measuring the reduced diameter with a micrometer. The thickness of the coating at this point is the difference between the measurement thus obtained and the measured diameter of the metallic coated wire. Determine the thickness of the coating at right angles to the first determination in a similar manner. When removing the PVC coating by scraping, take care not to remove any of the metallic surface.

13.3. PVC Adhesion Test—Make two cuts parallel to the axis of the wire through the coating, approximately 1/16 in. (1.6 mm) apart, at least 1/2 in. (12.7 mm) long. With a knife peel back a section of the coating between 1/8 in. (3.2 mm) and 1/4 in. (6.4 mm) long to produce a tab. Attempt to remove the 1/16 in. (1.6 mm) strip of coating by pulling the tab. The lot shall be acceptable if the coating breaks rather than separates from the core wire on all four specimens.

13.4. Weld Shear Strength of Fabric:

13.4.1.1. Scope—This test method covers the procedure for determining the strength of welded intersections of welded wire fabric.

13.4.1.2. Significance and Use—The weld shear strength is a measure of the ability of welds in wire fabric to resist the forces imposed on the wires tending to pull them apart.

13.4.1.3. Apparatus—Use a testing fixture which is intended to stress the vertical wire close to its center line, and to prevent rotation of the horizontal wire. This fixture can be used in most tensile testing machines and should be hung in a ball and socket arrangement at the center of the machine. This or a similarly effective fixture designed on the same principle, is acceptable (reference ASTM A185).

13.4.1.4. Test Specimens—Test specimens shall be obtained by cutting, from the finished fabric, a full width section including at least two transverse wires.

13.4.1.4.1. The transverse wire of each specimen shall extend approximately 1 in. (25 mm) on each side of the longitudinal wire. The longitudinal wire of each test specimen shall be of such length below the transverse wire so as to be adequately engaged by the grips of the testing machine. It shall be of such length above the transverse wire that its end shall be above the center line of the upper bearing of the testing device.

13.4.1.4.2. A test specimen shall consist of four welds selected at random from one transverse wire for weld shear strength. If the width of the fabric is such as to not include four welds that are suitable for testing, additional welds shall be taken from a second transverse wire to total four. (Welds at the edge wire are excluded from testing as there is no overhang to permit proper testing). If the average weld shear strength from the four specimens does not conform to the requirement of 7.2, test all the welds across the width (excluding edge welds) on one transverse wire, or on two transverse wires if some of the initial specimens were from the second transverse wire.

13.4.1.5. Weld Shear Test Procedure —Insert the long end of the vertical wire through the notch in the anvil. The vertical wire shall be in contact with the surface of the free rotating rollers while the horizontal wire shall be supported by the anvil on each side of the slot. The bottom jaws of the testing machine shall grip the lower end of the vertical wire and the load shall be applied at a rate of stressing not to exceed 100,000 psi/min. (689 MPa/min.)

13.4.1.6. Report—Report the test results to the nearest 5 pounds-force (25 newtons) for both individual results and the average of all tests.

13.4.1.7. Precision and Bias—The precision and bias of this test method for measuring weld shear strength are as specified in the test method included in Specification A 185.

13.4.1.8. Panel to Panel Connection—A set of two (2) identical rectangular gabion panels, each with a width of 36" and a minimum length of 9", shall be joined by any of the following methods.

13.4.1.8.1. Lacing wire - lacing wire shall be alternately single and double looped with spacing not to exceed 6". Ends shall be secured with two (2) complete revolutions and finish with a half (½) hitch.

13.4.1.8.2. Spiral Binders - spiral binders shall pass through the openings and shall be securely tied at both ends to prevent unraveling when a load is applied per the minimum strength requirements of Section 7.3. Each of the two panels shall be mounted on a loading machine with grips or clamps such that panels are uniformly

secured along the full width. The grips or clamps shall be designed to transmit only tension forces. The load then will be applied at a uniform rate not exceeding 50 lbs per second until maximum load is obtained. The maximum load is reached when a drop of strength is observed with subsequent loading.

14. INSPECTION

14.1. Unless otherwise specified in the contract or purchase order, the producer is responsible for the performance of all inspection and test requirements of this specification. The producer may use his own or any other suitable facilities for the performance of the tests unless disapproved by the purchaser at the time the order is placed. The purchaser at their own expense shall have the right to perform any of the inspections and tests set forth in this specification when such tests are deemed necessary to assure that the material conforms to prescribed requirements.

15. CERTIFICATION

15.1. When specified in the purchase order or contract, a producer's or supplier's certification shall be furnished to the purchaser that the material was manufactured, sampled, tested, and inspected in accordance with this specification and has been found to meet the requirements. When specified in the contract or purchase order, a report of the test results shall be furnished.

TABLE 1

Wire Diameters

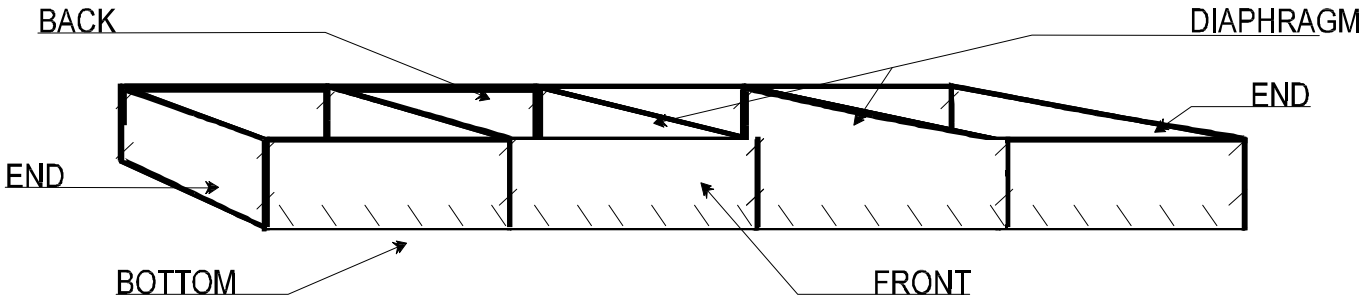
		Minimum Nominal Diameter Metallic Coated Wire in. (mm) A	Minimum Diameter PVC Coated Wire (Including Coating) in. (mm) B	Nominal Diameter PVC Coated Wire (Including Coating) in. (mm) C
Wire for PVC coated gabions		0.106 (2.7)	0.136 (3.5)	0.146 (3.7)
		0.120 (3.05)*	0.150 (3.8)*	0.160 (4.0)*
Wire for metallic coated gabions		0.120 (3.05)	N/A	N/A
Wire for gabion mattresses		0.087 (2.2)	0.117 (3.0)	0.127 (3.2)
Spiral binders for gabions				
	PVC coated	0.106 (2.7)	0.136 (3.5)	0.146 (3.7)
	Metallic coated	0.120 (3.05)	N/A	N/A
Spiral binders for gabion mattresses, metallic or PVC coated		0.087 (2.2)	0.117 (3.0)	0.127 (3.2)
Lacing wire		0.087 (2.2)	0.117 (3.0)	0.127 (3.2)
Stiffeners	A) lacing wire	0.087 (2.2)	0.117 (3.0)	0.127 (3.2)
	B) Preformed	0.120 (3.05)	0.150 (3.8)	0.160 (4.0)

*Option: Values designated by * indicate optional 11 gauge PVC coated wire

TABLE 2

Typical Gabion Mattress Sizes

Length Ft. (cm)	Width Ft. (cm)	Height Ft. (cm)	Number of Cells	Area Sq. Yds (Sq. m)
9' (274.3)	6' (182.9)	6" (15.2)	3	6.0 (5.2)
12' (365.8)	6' (182.9)	6" (15.2)	4	8.0 (6.69)
9' (274.3)	6' (182.9)	9" (22.9)	3	6.0 (5.2)
12' (365.8)	6' (182.9)	9" (22.9)	4	8.0 (6.69)



WELDED WIRE GABION

DIVISION 32

SECTION 32125
CONCRETE CHANNEL LINING

PART 1 SCOPE

1.1 This work shall consist of the construction of reinforced concrete channel lining, plain concrete ditch paving and reinforced concrete ditch paving of the dimensions, details, and sections presented in the Plans, stipulated in the Contract Documents, or as directed by the Owner. The construction shall be accomplished in accordance with these Specifications and in conformity with the lines, grades, cross-sections, and details shown on the Plans and directions furnished by the Owner. The work shall include such labor, material, and equipment required to successfully complete the work.

PART 2 MATERIALS AND EQUIPMENT

2.1 MATERIAL

A. New Material.
All materials shall be subject to sampling, testing, and approval or rejection by the Owner. Unless otherwise specified, all materials incorporated into the work shall be new and unused in previous construction. Used materials, acceptable to the Owner, may be used for trench bracing, forms, falsework, and similar uses.

B. Manufacturer's Qualifications.
The source of supply for each material to be supplied by the Contractor shall be subject to approval by the Owner before delivery.

C. Inspection and Testing.

1. Representative samples of materials intended for incorporation in the work shall be submitted for examination when so specified or requested by the Owner. All materials to be used in the work shall be sampled, inspected, and tested in accordance with current ASTM specifications, or other specified standard specifications. The Contractor shall furnish the Owner with three copies of certified reports from a reputable testing laboratory showing the results of the tests carried out on representative samples of materials delivered and to be used in the project. The performance or cost of all testing is incidental to the work and shall be done at no cost to the City.

2. The Contractor shall notify the Owner in advance of any deliveries of the materials and shall make whatever provisions are necessary, including the furnishing of such labor as may be required to aid the Owner in the examination, inspection and culling of the materials on the site prior to installation in the work.

3. All materials not conforming to the requirements of these Specifications shall be considered as defective and rejected for use and shall be removed from the site of the work.

D. Storage.
The Contractor shall provide such storage facilities and exercise such measures as will insure the preservation of the specified quality and fitness of materials to be incorporated in the work.

E. Concrete.
Channel lining and ditch paving shall be constructed of approved materials as defined in Specification Section 03300.

F. Steel Reinforcement.
Deformed steel reinforcing bar shall conform to ASTM A 615 for Grade 40 or Grade 60 and shall be of the grades, sizes, and dimensions and at the designated spacing's and locations shown on the Plans or as directed by the Owner. Welded wire fabric conforming to ASTM A 185 shall have a minimum yield strength of 65,000 psi and fabric conforming to ASTM A 497 shall have a minimum yield strength of 70,000 psi and shall be of the size, design, and weight and at the locations shown on the Plans or as directed by the Owner. All steel reinforcement and its storage and handling shall be as specified in Specification Section 03201.

G. Filter Cloth and Fasteners.
The filter cloth material and fasteners for weep hole drainage system shall conform to the requirements of Specification Section 31251.

H. Washed Gravel.
Washed gravel for weep hole drainage system shall conform to the requirements of Specification Section 32318.

I. Weep Hole Drain Pipe.
1. Perforated and non-perforated tubing and fittings for weep hole drainage system shall be of the diameter specified on the Design Standards or as directed by the Owner and of only one pipe material for the entire job.

2. Perforated and non-perforated polyethylene corrugated tubing and fittings shall meet the requirements of AASHTO M252 and M294

2.2 EQUIPMENT
All equipment required for the satisfactory performance of the work shall be on the project and approved before work will be permitted to begin.

PART 3 – CONSTRUCTION REQUIREMENTS

3.1 CONCRETE CHANNEL LINING.

A. General.
The requirements for concrete formwork, falsework, reinforcement, placing concrete, removal of forms and falsework, removal of defective concrete, and curing and protection of concrete as defined in "Division 3" of the project specifications shall apply to the construction of concrete channel lining except as modified in this section of the Specifications. Concrete materials, proportioning, mixing, and delivery shall conform to Specification Section 03300, "Cast-In-Place Concrete". The subgrade shall be carefully

shaped to the channel section shown on the Plans and compacted to provide a firm foundation for the structure in conformance with Specification Sections 31311 & 31315.

B. Weep Hole Drainage System.
The weep hole drainage system shall be constructed as shown on the Design Standards, or as directed by the Owner. The weep holes and weep hole drainage system shall be constructed in conformance with the requirements as specified on the plans.

C. Expansion Joints.
Transverse expansion joints shall be provided at 30 foot intervals. Expansion joints shall be constructed at right angles to the centerline of the channel, throughout channel bottom and sidewalls in conformance with Design Standards. Preformed expansion joint material shall be ¾ inch thickness and full depth of slab and walls.

D. Connecting Storm Drains (If Applicable).
Existing and new storm drains intercepted by the channel shall be formed into sidewalls and cut off flush and smooth with the inside face of the wall so as to not leave an obstruction along the wall. Channel sidewalls shall be poured monolithically around pipe sections. Intercepted drains shall be skewed in the direction of flow. The steel reinforcement shall be placed around each pipe end as it intersects the channel wall in accordance with the Design Standards. Existing pipes 12 inches in diameter or smaller intercepted by the channel shall be extended as required for proper connection at no additional compensation. Existing pipes larger than 12 inches in diameter shall be extended as required for proper connection and paid for at the appropriate price per linear foot for the pipe. Pipe extensions shall be of the same material as the existing pipe to which it is connected, except for pipe larger than 12 inches in diameter which shall be reinforced concrete pipe unless otherwise directed by the Owner.

E. Finish.
Sidewalls shall be given a Class 1 ordinary surface finish and the bottom slab shall be given a Class 3, float finish except for brushing as defined in Specification Section 03310 Paragraph 3.11. Sidewalls and slab shall be protected and cured in accordance with Specification Section 03390 Paragraph 3.4.

F. Invert.
The bottom slab and related invert elevations of the channel shall be constructed as shown on the Plans.

G. Fence Posts & Sleeves.
Fence Posts & sleeves are not permitted in the concrete, unless otherwise directed by the Owner.

H. Test Specimens.
The Contractor shall furnish the concrete necessary for casting test specimens in the field. The City will supply all molds and labor necessary to cast and test the specimens. The Owner will designate the frequency of sampling the fresh concrete. The method of making and curing test specimens will be in accordance with AASHTO Designation T 23. Test cores shall be drilled by the Contractor at his expense if required by the Owner at locations selected by the Owner.

I. Backfilling.
Full backfill shall not be placed until representative test samples of the concrete used in the channel lining attains a compressive strength of 3,000 pounds per square inch. In addition, the concrete shall have been placed a minimum of 7 days (not counting days of 24 hours each when the temperature is below 40 degrees F.) or 21 calendar days whichever comes first. Backfill shall be placed by means which insures proper compaction. Backfill above filter cloth closure shall be of suitable nonporous material. Placement and compaction of the backfill and final cleanup shall be in accordance with Specification Section 31315.

J. Access Ramp.
Access ramps for maintenance vehicles shall be constructed at the locations and to the details shown on the Plans. Location of contraction and expansion joints in channel lining shall be adjusted to fall outside of the ramp connection area. Longitudinal channel wall reinforcement shall be bent and tied to ramp wall reinforcement. Longitudinal ramp bottom reinforcement shall extend into the channel bottom area a minimum of 30 inches.

K. Channel Transitions.
Transitions in wall height and/or channel width shall be constructed within the limits shown on the Plans or as directed by the Owner. The full height of wall or width of channel, including the transition portion, shall be poured monolithically. Continuous vertical reinforcement as required in the Plans for the full wall height constructed shall be placed to insure structural adequacy for the higher wall segment. The transition from one wall height to another shall be accomplished with a smooth and uniform slope on the top of wall.

END OF SECTION

SECTION 32128
JOINT SEALERS

PART 1 - GENERAL

1.1 SCOPE

This Section covers the furnishing of material and installation including equipment, appliances necessary for and to properly complete all caulking and sealing for where indicated or specified herein. For pavement, sealer shall be used for asphalt to asphalt joints and/or cracks only.

1.2 GOVERNING REFERENCE SPECIFICATIONS

The latest editions of the following specifications and references govern the work in this Section and constitute minimum requirements. Where specific requirements of this Section are more stringent, they shall supersede the corresponding requirements of these Reference Specifications.

Federal Specifications TT-S-00227E.

American Society for Testing Materials – ASTM C-920.

PART 2 - PRODUCTS

2.1 MATERIALS

A two-component polyurethane elastomeric sealant, recommended by manufacturer for vertical use (a non-sag self-leveling consistency). Joint sealant to be Sikaflex-2c NS/SL or approved equal.

PART 3 – EXECUTION

3.1 The extent of each form and type of joint sealer in indicated on drawings and by provisions of this Section.

A. The applications for joint sealers as work of this Section include the following:

1. Asphalt joints and cracks.
2. Pre-cast unit to pre-cast unit joint.
3. Perimeter joints around abutment wall.
4. Slab and wall joints.
5. Channel walls and slabs.

B. This sealant shall not be used for concrete pavement joints or cracks or transverse sidewalk joints.

3.2 JOINT SEALERS

A. Provide materials for compatibility with joint surfaces and other indicated exposures, and except as otherwise indicated select modulus of elasticity and hardness of grade recommended by manufacturer for each application indicated. Where exposed to foot traffic, select marketing materials of sufficient strength and hardness to withstand stiletto heel traffic without damage or deterioration of sealer system.

B. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directions otherwise.

C. Clean joint surfaces immediately before installation of sealant or caulking compound. Joints shall be cleaned in accordance with Item 438 of the TxDOT Standard Specifications for Construction of Highways, Streets, and Bridges. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer.

D. Cure sealant and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength, and surface durability.

E. It shall be the responsibility of the contractor to provide an application test for observation and review by the City Engineer or his/her designated representative. This demonstration test shall be conducted prior to actual placement of permanent joint sealer. A product technical representative must also be present at the time of the test.

END OF SECTION

SECTION 32318
CRUSHED STONE AND GRAVEL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall furnish and place crushed stone and gravel of the types specified at locations shown and as directed by the ENGINEER.

B. Related Sections:
   1. Section 31315 - Excavation and Backfill.

1.2 REFERENCES

A. Standards referenced in this Section are listed below:
   1. American Society for Testing and Materials, (ASTM).
      a. ASTM C 131, Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
      b. ASTM C 136, Test Method for Sieve Analysis of Fine and Coarse Aggregates.
      c. ASTM D 75, Practice for Sampling Aggregates.
      d. ASTM D 448, Classification for Sizes of Aggregate for Road and Bridge Construction.

1.3 SUBMITTALS

A. Shop Drawings: Submit the following:
   1. Furnish representative samples of the crushed stone and gravel to the ENGINEER and advise of the source location.
   2. Test reports, including sieve analyses, showing material compliance with specified requirements.

B. Sampling and sieve analysis shall be performed in accordance with the requirements of ASTM D 75 and ASTM C 136.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Crushed Stone or Screened Gravel for Foundations:
   1. CONTRACTOR shall furnish and place crushed stone or screened gravel fill under pipe or structures, in addition to that required under other Sections. This material shall be placed at such locations as directed by the ENGINEER, in writing, to replace material unsuitable for the foundations of the pipe or structure or to increase the load carrying capacity of the pipe. It shall also be used to refill over excavations by CONTRACTOR.
   2. Crushed stone and gravel shall be clean, hard, sound, durable, uniform in quality, and free of any detrimental quantity of soft, friable, thin elongated, or laminated pieces, disintegrated material, organic matter, oil, alkali, or other deleterious substance.
   3. The loss by abrasion in the Los Angeles abrasion machine, determine as prescribed in ASTM C 131, Grading A, shall not exceed ten percent, by weight, after 100 revolutions nor 40 percent after 500 revolutions.

4. Crushed Stone:
   a. Crushed stone shall consist of the product obtained by crushing rock, stone, or gravel so that at least 50 percent by weight of aggregate retained on the No. 4 sieve for 3/4-inch or larger maximum sizes, and 50 percent retained on the No. 8 sieve for maximum sizes less than 3/4-inch shall consist of particles which have at least one rough, angular surface produced by crushing.
   b. The gradation of crushed stone shall comply with the requirements of ASTM D 448.
5. Gravel:
   a. Material designated herein as gravel shall be composed entirely of particles that are either fully or partially rounded and water-worn.
   b. Crushed rock obtained by crushing rock which exceeds ASTM D 448 maximum gradation sizes may be combined provided it is uniformly distributed throughout and blended with the gravel. The quality and gradation requirements shall be as stated in this Section.

B. Filter and Bedding Gravel:
1. CONTRACTOR shall furnish and place all material required for filter layers and riprap bedding as shown or directed by the ENGINEER, in writing. Graded gravel or layers of sand and gravel or crushed rock are required for filters or riprap bedding.
2. Filter and bedding gravel may be furnished either as a graded gravel conforming to the size distributions specified below or as a two layer filter consisting of layers of sand and crushed rock or gravel.
3. If a single layer is used, it shall consist of a mixed sandy and gravelly material well graded between the limits shown below:

Sieve Size	Percent Passing
3-inch	100
3/4-inch	75 to 85
No. 4	55 to 65
No. 60	10 to 20
No. 100	less than 5

4. If a two layer filter is used, it shall be composed of sand and gravel well graded between the limits shown.

Crushed Stone or Gravel

Sieve Size	Percent Passing
1-1/2-inch	95 to 100
3/4-inch	35 to 70
3/8-inch	10 to 30
No. 4	0 to 5

Sand

Sieve Size	Percent Passing
3/8-inch	100
No. 8	75 to 80
No. 60	10 to 20
No. 100	less than 5

5. All sand shall consist of clean, hard, durable particles free from organic or other deleterious matter. Crushed stone, crushed or uncrushed gravel shall be clean, hard, durable material of acceptable quality.

PART 3 - EXECUTION

3.1 PLACING

A. Crushed Stone, Gravel and other materials shall be spread in layers of uniform thickness not exceeding 8-inches and shall be thoroughly compacted with suitable power driven tampers or other power driven equipment. The placing of crushed stone or gravel shall conform to applicable requirements of Section 31315, Excavation and Backfill, except as noted above.

END OF SECTION

SECTION 32371
RIPRAP AND ROCK LINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Riprap placed loose.
B. Related Sections:
   1. Section 31311 - Rough Grading.
   2. Section 31315 - Excavation and Backfill
   3. Section 31231 - Trenching

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Riprap:
   1. Basis of Measurement: By square yard of riprap area; summing areas of individual layers, of riprap.
   2. Basis of Payment: Includes supply and placing riprap mix in sacks, moist cured.

1.3 SUBMITTALS

A. Product Data: Submit data for riprap bags, binder and geotextile fabric.
B. Samples: Submit, in air-tight containers, 10 lb (4.5 kg) sample of aggregate materials to testing laboratory.
C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.
B. Perform Work in accordance with Owner Standards.
C. Maintain one copy of each document on site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Furnish materials in accordance with Texas Department of Transportation Item 432.
B. Riprap: Irregular shaped rock, minimum size not less than 1/3 maximum dimension, 12 inch maximum size; solid and non-friable. (Unless noted otherwise in plans)
C. Aggregate Type: As specified in plans.
D. Geotextile Fabric: Non-biodegradable, woven; manufactured by MacTex Woven & 28 mil erosion control Geotextile weed barrier fabric. (Unless noted otherwise in plans)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of existing conditions before starting work.
B. Do not place riprap bags over frozen or spongy subgrade surfaces.

3.2 PLACEMENT

A. Place geotextile fabric over substrate, lap edges and ends.
B. Place riprap at culvert pipe ends, at embankment slopes, and as indicated on Drawings.
C. Remove foreign matter from surfaces.
D. Installed Thickness: As indicated on Drawings.
E. Place rock evenly and carefully over riprap to minimize voids; do not tear bag fabric, place bags and rock in one consistent operation to preclude disturbance or displacement of substrate.

3.3 SCHEDULES

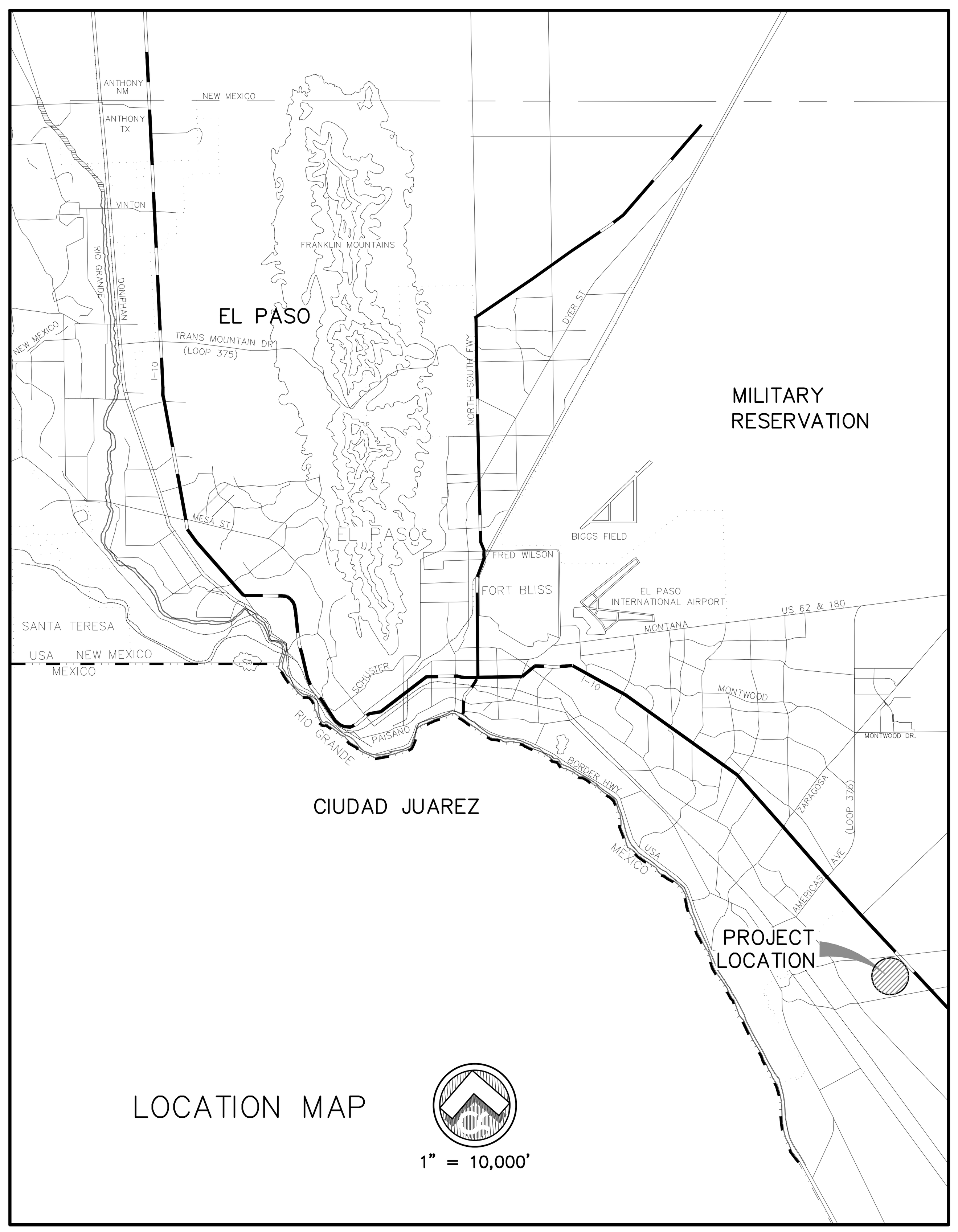
A. Gravel Trench for Concrete Channel: Individual riprap units, 12 inch (150 mm) thickness; placed prior to concrete pour; or as designated on plans.

END OF SECTION

Bid Set 6/28/16

SPARKS ARROYO DRAINAGE IMPROVEMENTS

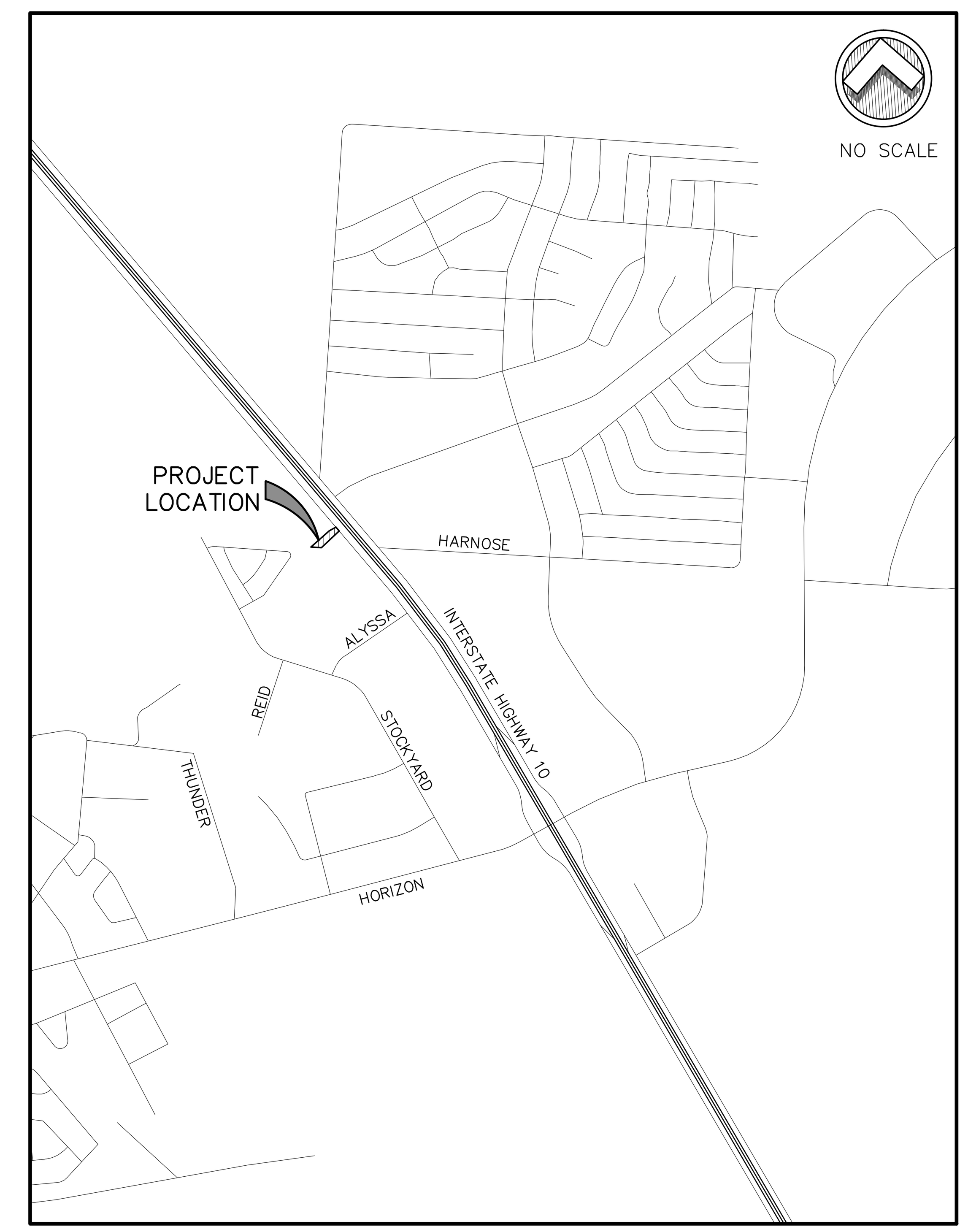
SOCORRO, TEXAS



LOCATION MAP

Drawing Index

SHEET NO.	DRAWING TITLE
	COVER SHEET
C1.0	EXISTING CONDITIONS
C2.0	SITE PLAN
C3.0	GRADING PLAN
C4.0	CROSS SECTIONS
C4.1	CROSS SECTIONS
C5.0	TYPICAL DETAILS
C5.1	CONCRETE WALL AND GABION MATTRESS DETAILS
C6.0	STORM WATER POLLUTION PREVENTION
C6.1	STORM WATER POLLUTION PREVENTION NOTES



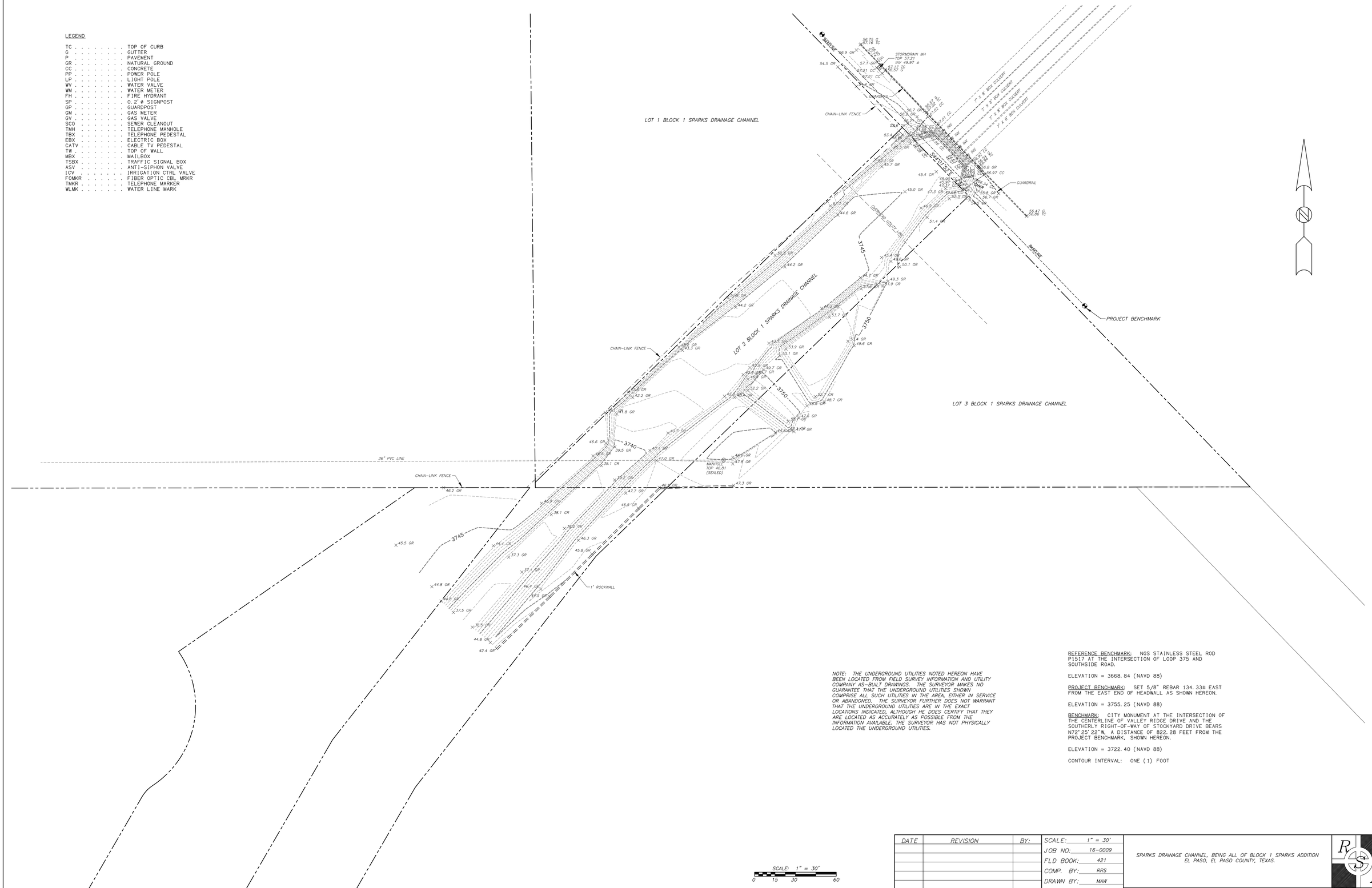
VICINITY MAP

csa design group, inc.
Texas Registered Engineering Firm F-9997
1845 Northwestern Dr. Ste C
El Paso, Texas 79912
tel [915] 877.4155
fax [915] 877.4334
www.csaengineers.com

1603 SPARKS ARROYO DRAINAGE IMPROVEMENTS

LEGEND

TC	TOP OF CURB
G	GUTTER
P	PAVEMENT
GR	NATURAL GROUND
CC	CONCRETE
PP	POWER POLE
LP	LIGHT POLE
WV	WATER VALVE
WM	WATER METER
FH	FIRE HYDRANT
SP	0.2' ø SIGNPOST
GP	GUARDPOST
GM	GAS METER
GV	GAS VALVE
SCO	SEWER CLEANOUT
TMH	TELEPHONE MANHOLE
TBX	TELEPHONE PEDESTAL
EBX	ELECTRIC BOX
CATV	CABLE TV PEDESTAL
TW	TOP OF WALL
MBX	MAILBOX
TSBX	TRAFFIC SIGNAL BOX
ASV	ANTI-SIPHON VALVE
ICV	IRRIGATION CTRL VALVE
FOMKR	FIBER OPTIC CBL MRKR
TMKR	TELEPHONE MARKER
WLMK	WATER LINE MARK



NOTE: THE UNDERGROUND UTILITIES NOTED HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND UTILITY COMPANY AS-BUILT DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES ARE IN THE EXACT LOCATIONS INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

REFERENCE BENCHMARK: NGS STAINLESS STEEL ROD P1517 AT THE INTERSECTION OF LOOP 375 AND SOUTHSIDE ROAD.

ELEVATION = 3668.84 (NAVD 88)

PROJECT BENCHMARK: SET 5/8" REBAR 134.33± EAST FROM THE EAST END OF HEADWALL AS SHOWN HEREON.

ELEVATION = 3755.25 (NAVD 88)

BENCHMARK: CITY MONUMENT AT THE INTERSECTION OF THE CENTERLINE OF VALLEY RIDGE DRIVE AND THE SOUTHERLY RIGHT-OF-WAY OF STOCKYARD DRIVE BEARS N72° 25' 22"W, A DISTANCE OF 822.28 FEET FROM THE PROJECT BENCHMARK, SHOWN HEREON.

ELEVATION = 3722.40 (NAVD 88)

CONTOUR INTERVAL: ONE (1) FOOT

SCALE: 1" = 30'
0 15 30 60

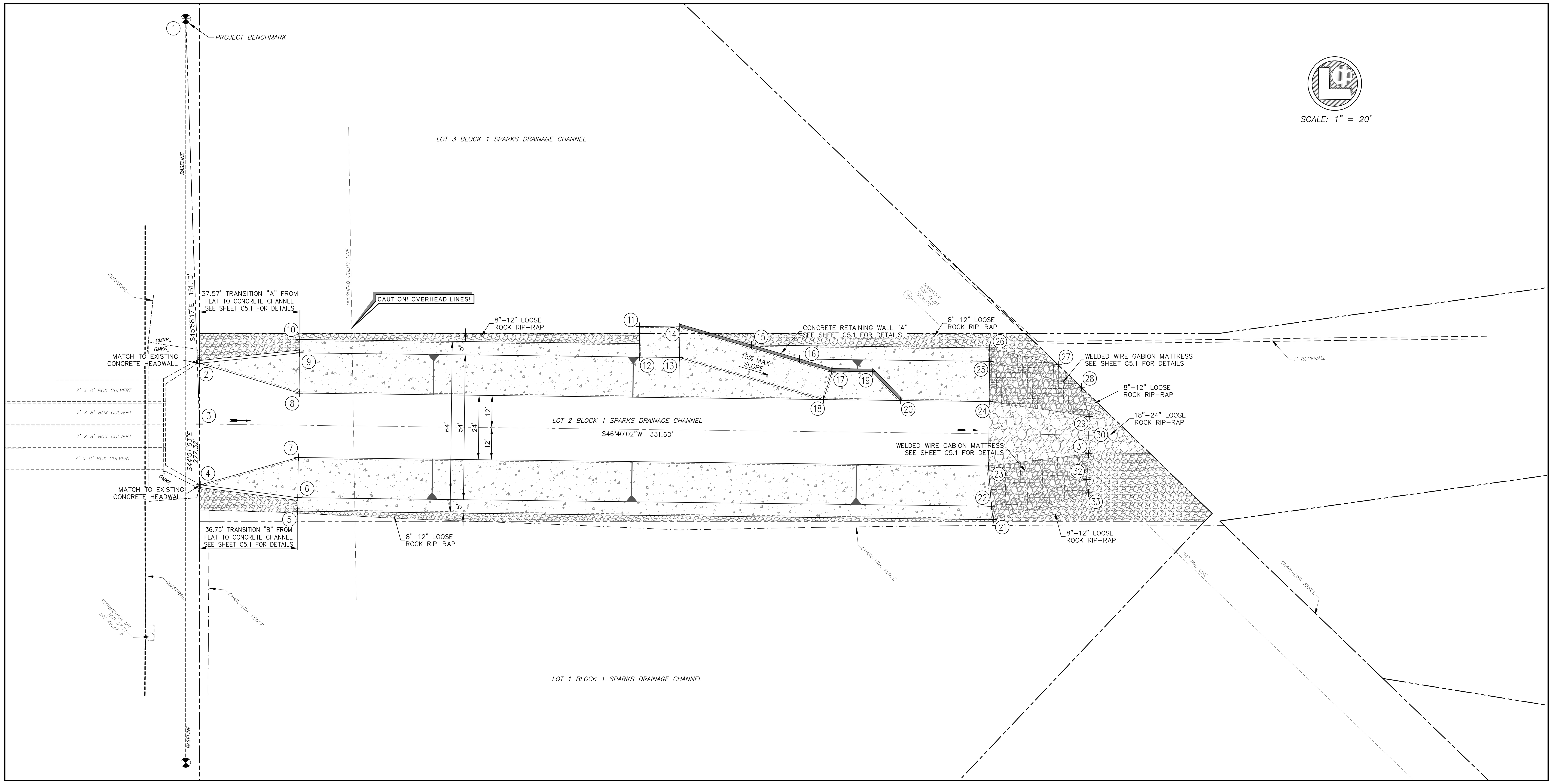
DATE	REVISION	BY:

TEXAS REG. SURVEYING FIRM 10060500

SCALE: 1" = 30'
JOB NO: 16-0009
FLD BOOK: 421
COMP. BY: RRS
DRAWN BY: MAW
CHK'D BY: FC
DWG. DATE: 04-07-16
SVY. DATE: 04-12-16

SPARKS DRAINAGE CHANNEL, BEING ALL OF BLOCK 1 SPARKS ADDITION
EL PASO, EL PASO COUNTY, TEXAS.

ROBERT SEIPEL ASSOCIATES, INC.
PROFESSIONAL LAND SURVEYORS
1845 NORTHWESTERN DR. SUITE C EL PASO, TX 79912 915-877-1928



COMPACTION REQUIREMENTS:

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UNDER STRUCTURES, BUILDING PADS, CURBS, STEPS AND PAVEMENTS:
CONTRACTOR SHALL COMPACT TOP TWELVE INCHES OF SUBGRADE AND EACH LAYER OF BACKFILL MATERIAL TO 95% MAXIMUM DRY DENSITY AS PER ASTM D-1557.

UNDER WALKWAYS:
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NOTE: THE COMPACTION REQUIREMENTS STATED ABOVE ARE MINIMUM COMPACTION REQUIREMENTS. THE CONTRACTOR SHALL ALSO PROVIDE COMPACTION AS REQUIRED BY GEOTECHNICAL INVESTIGATION REPORT.

DUST AND EROSION CONTROL NOTE:

CONTRACTOR SHALL MAKE PROVISIONS FOR TEMPORARY DUST AND EROSION CONTROL WHERE EXTENSIVE EARTH MOVING OR DUST PRODUCING OPERATIONS ARE PERFORMED. CONTRACTOR SHALL USE WATER SPRINKLING AND OTHER METHODS TO LIMIT DUST AND DIRT MIGRATION. CONTRACTOR SHALL COMPLY WITH GOVERNING REGULATIONS PERTAINING ENVIRONMENTAL PROTECTION.

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EL PASO ELECTRIC CO.	543-5720
AT&T	1-800-DIG-TESS
TEXAS GAS SERVICE	544-6300
EMERGENCY HOTLINE	562-8411/562-2003
PUBLIC SERVICE BOARD (WATER & SEWER)	1-800-DIG-TESS
TEXAS EXCAVATION SAFETY SYSTEM	1-800-344-8377
TIME WARNER COMMUNICATION	775-7414

WARNING !
BEFORE YOU DIG
CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND IMPROVEMENTS IN PROJECT AREA

Jun 27, 2016 - 12:58pm
S:\Draw\1603 Sparks Arroyo\1603 Bid Submittal-CURRENT\1603 Sht 2.0 Site.dwg
aontiveros

GENERAL NOTES:

1. ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH PROJECT REQUIREMENTS STATED ON THESE DRAWINGS AND THE PROJECT MANUAL CONTAINING SPECIFICATIONS AND PROPERTY AGREEMENTS.
2. LOCATIONS OF ALL UTILITIES SHOWN ON THIS PLAN ARE APPROXIMATE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT ALL UTILITY COMPANIES FOR THE EXACT LOCATION OF UNDERGROUND AND OVERHEAD UTILITIES INCLUDING UTILITIES NOT SHOWN ON PLANS. THE CONTRACTOR SHALL PROTECT ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES AND ANY UTILITIES NOT SHOWN ON THIS PLAN DURING CONSTRUCTION. THE CONTRACTOR WILL PERFORM ALL UTILITY INSTALLATION, REMOVAL AND RELOCATIONS AS PER LOCAL UTILITY CONSTRUCTION SPECIFICATIONS. ANY UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
3. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND ELEVATIONS ON SITE PRIOR TO CONSTRUCTION AND SHALL CONTACT THE DESIGN ENGINEER AND REPORT ANY DISCREPANCIES, OMISSIONS AND/OR ERRORS ON PLANS PRIOR TO COMMENCING WORK.
4. ALL CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH THE CITY OF SOCORRO STANDARD SPECIFICATIONS AND DETAILS.
5. CONTRACTOR SHALL PERFORM ALL EARTHWORK OPERATIONS IN ACCORDANCE WITH THE GEOTECHNICAL INVESTIGATION REPORT.
6. ALL ORGANIC MATERIAL SHALL BE CLEARED AND GRUBBED TO A DEPTH OF A MINIMUM OF SIX (6) INCHES AND REMOVED FROM THE SITE. NO SCREENING OF THIS MATERIAL WILL BE ALLOWED FOR RE-USE ON THE SITE UNLESS RE-VEGETATION IS PROPOSED AS AN ANTI-EROSION MEASURE UPON COMPLETION OF THE GRADING OPERATIONS.
7. GRADING SHALL BE PERFORMED WITHOUT MAJOR ALTERATION OF WATERSHEDS AND DRAINAGE PATTERNS UNLESS APPROPRIATE AND ADEQUATE MEANS OF STORM WATER RETENTION OR CONTROL ARE UTILIZED AND SHOWN OF THE GRADING PLAN.
8. NO GRADING OPERATION SHALL EXCAVATE OR FILL SO AS TO CAUSE FALLING ROCKS, SOILS, OR OTHER DEBRIS IN ANY FORM TO FALL, SLIDE, OR FLOW ON TO ADJACENT PROPERTIES.
9. EMBANKMENTS AND SLOPES SUPPORTING OCCUPIED BUILDINGS, STREETS, AND ROADWAYS SHALL HAVE A SAFETY FACTOR OF NOT LESS THAN 1.5.
10. NO ON-SITE PROCESSING OF MATERIAL FOR COMMERCIAL OR RETAIL SALES SHALL BE ALLOWED. ON-SITE PROCESSING OF MATERIALS TO BE USED FOR PREPARATION OR CONSTRUCTION IMPROVEMENTS WITHIN THE SITE COVERED BY THE GRADING PERMIT SHALL BE ALLOWED.
11. WORK SHALL BE CONDUCTED IN A MANNER THAT PRESERVES AND DOES NOT OBSTRUCT, IMPEDE, OR INTERFERE WITH THE FLOW OF STORM WATER IN NATURAL DRAINAGE WAYS, UNIMPROVED CHANNELS OR WATERCOURSES, OR IMPROVED DITCHES, CHANNELS, OR CANALS IN SUCH A MANNER AS TO CAUSE FLOODING WHERE IT WOULD NOT OTHERWISE OCCUR.
12. MATERIAL STOCKPILING SHALL BE LIMITED TO FOUR (4) FEET HIGH WHEN GRADING OPERATIONS ARE IDLE FOR MORE THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS. STOCKPILING SHALL BE LIMITED TO TEN (10) FEET HIGH WHEN GRADING OPERATIONS ARE BEING CONDUCTED.
13. A TRAFFIC CONTROL PERMIT SHALL BE REQUIRED IF GRADING OPERATIONS WILL IMPACT TRAFFIC. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ACQUIRE SAID PERMIT. TRAFFIC CONTROL SHALL ADHERE TO ALL CITY OF SOCORRO REQUIREMENTS.
14. ANY USE OF VIBRATORY EQUIPMENT SHALL BE APPROVED IN WRITING BY THE CITY ENGINEER IN ADVANCE OF SUCH USE.
15. THE CITY ENGINEER MUST BE NOTIFIED NO LATER THAN 4:00 PM ONE DAY PRIOR TO ANY GRADING WORK, BACKFILL DENSITIES, INSPECTIONS AND/OR CONSTRUCTION OPERATIONS SUCH AS PLACEMENT OF CURB AND GUTTER, PAVEMENT, AND STORM SEWER STRUCTURES. ADDITIONAL ACTIVITY REQUIREMENTS/RESTRICTIONS MAY BE SPECIFIED BY THE DESIGN ENGINEER OF RECORD.
17. A COPY OF ALL CURRENT PERMITS REQUIRED FOR CONSTRUCTION SHALL BE MAINTAINED ON-SITE. THESE PERMITS MUST BE DISPLAYED IN A COMMON AND INCONSPICUOUS LOCATION ON THE JOB SITE.
18. NO GRADING OF ANY KIND WILL BE CONDUCTED ON LEGAL HOLIDAYS OR WEEKENDS (7:00 PM FRIDAY THROUGH 7:00 AM ON THE FOLLOWING MONDAY) UNLESS THE CITY OF SOCORRO HAS NOTIFIED THE CITY'S ENGINEERING DEPARTMENT BY NOON THE DAY BEFORE THE HOLIDAY, OR BY NOON ON FRIDAY. GRADING SHALL NOT BE PERMITTED WITHIN THREE HUNDRED (300) FEET OF A RESIDENTIALLY ZONED AREA BEFORE 7:00 AM OR AFTER 7:00 PM ON WEEKENDS OR HOLIDAYS.
19. INSTALLATION OF A TRENCH SAFETY SYSTEM IS REQUIRED FOR ALL TRENCHES EXCEEDING A DEPTH OF FIVE FEET (5') AND MUST CONFORM TO THE CITY OF SOCORRO DESIGN STANDARDS AS WELL AS OSHA REQUIREMENTS.
20. POSITIVE DRAINAGE SHALL BE PROVIDED BY CONTRACTOR DURING ALL PHASES OF CONSTRUCTION AND GRADING.
21. THE OWNER SHALL BE RESPONSIBLE FOR THE PREPARATION AND SUBMITTAL OF ALL PERMITTING NECESSARY FOR EARTHWORK OPERATIONS AND STORM WATER POLLUTION CONTROL.
22. WHERE A DRAINAGE WAY WILL BE CROSSED BY CONSTRUCTION VEHICLES REGULARLY DURING CONSTRUCTION, A TEMPORARY CROSSING SHALL BE CONSTRUCTED.
23. ALL CONCRETE JOINTS INCLUDING EXPANSION, CONSTRUCTION CONTROL, AND SAWCUT WILL CONFORM TO ACI 302.IR-89 & 360R-92 CODE. EXPANSION JOINTS SHOULD BE SEALED WITH A POLYURETHANE SEALANT SO THAT MOISTURE INFILTRATION INTO THE SUBGRADE SOILS AND RESULTANT CONCRETE DETERIORATION AT THE JOINT IS MINIMIZED.
24. FILLS SHALL BE PLACED AND COMPACTED TO PRODUCE A STRUCTURALLY STABALIZED SLOPE IN ACCORDANCE WITH DESIGN STANDARDS OF THE CITY OF SOCORRO AND THE GEOTECHNICAL INVESTIGATION REPORT.
26. CONSTRUCTION EQUIPMENT SHALL BE KEPT OUT OF WATERCOURSES EXCEPT WHEN NECESSARY TO PERFORM WORK ON THE APPROVED PLANS. WHERE IN-CHANNEL WORK IS DESIGNATED ON THE APPROVED PLANS, PRECAUTIONS SHALL BE TAKEN TO STABILIZE THE WORK AREA DURING CONSTRUCTION TO MINIMIZE EROSION AS SHOWN ON THE PLANS. THE CHANNEL, INCLUDING THE BED AND THE BANKS, SHALL ALWAYS BE RE-STABILIZED IMMEDIATELY AFTER THE IN-CHANNEL WORK IS COMPLETED.

FLOOD ZONE DESIGNATION: ACCORDING TO FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP PANEL 480212-0237B, DATED SEPTEMBER 4, 1991, THIS PROPERTY LIES IN FLOOD HAZARD ZONE "AE" BASE FLOOD ELEVATIONS DETERMINED.

LEGAL DESCRIPTION: SPARKS DRAINAGE CHANNEL, BEING ALL OF LOT 2, BLOCK 1 SPARKS ADDITION
EL PASO, EL PASO COUNTY, TEXAS.

LEGEND

TC	TOP OF CURB
G	GUTTER
P	PAVEMENT
GR	NATURAL GROUND
CC	CONCRETE
PP	POWER POLE
LP	LIGHT POLE
WV	WATER VALVE
WM	WATER METER
FH	FIRE HYDRANT
SP	0.2'ø SIGNPOST
GP	GUARDPOST
GM	GAS METER
GV	GAS VALVE
SCO	SEWER CLEANOUT
TMH	TELEPHONE MANHOLE
TBX	TELEPHONE PEDESTAL
EBX	ELECTRIC BOX
CATV	CABLE TV PEDESTAL
TW	TOP OF WALL
MBX	MAILBOX
TSBX	TRAFFIC SIGNAL BOX
ASV	ANTI-SIPHON VALVE
ICV	IRRIGATION CTRL VALVE
FOMKR	FIBER OPTIC CBL MRKR
TMKR	TELEPHONE MARKER
WLMK	WATER LINE MARK
——— — — ———	PROPERTY LINE
←—	DIRECTION OF DRAINAGE FLOW
——◀	TOE OF SLOPE

COORDINATE TABLE

No.	NORTHING	EASTING	No.	NORTHING	EASTING
1	−541.98	10964.55	18	−605.26	10694.96
2	−453.24	10871.65	19	−625.29	10689.18
3	−436.94	10855.89	20	−624.85	10674.20
4	−420.83	10839.94	21	−617.00	10618.41
5	−439.08	10806.99	22	−620.14	10622.36
6	−442.72	10810.42	23	−630.15	10633.61
7	−453.63	10820.71	24	−647.60	10650.08
8	−471.09	10837.18	25	−658.51	10660.38
9	−482.00	10847.48	26	−662.15	10663.81
10	−485.63	10850.91	27	−675.34	10641.11
11	−577.16	10763.24	28	−675.36	10629.15
12	−568.86	10755.41	29	−669.59	10619.49
13	−579.15	10744.50	30	−664.49	10614.69
14	−587.45	10752.33	31	−659.39	10609.90
15	−601.19	10728.42	32	−652.09	10603.72
16	−609.89	10711.91	33	−648.92	10599.78
17	−614.99	10700.09			

BID SET

REFERENCES — BENCH MARKS

DATE	REVISIONS	BY
6/28/16	Bid Set	JCK
5/9/16	1st City Submittal	JCK

FIRM'S NAME
csa design group, inc.
1845 Northwestern Dr. Ste C
El Paso, Texas 79912
tel (915) 877.4155
fax (915) 877.4334
www.csaengineers.com

FIRM'S SEAL
STATE OF TEXAS
JOHN C. KARLSRUHER
53878
REGISTERED PROFESSIONAL ENGINEER
06/28/16

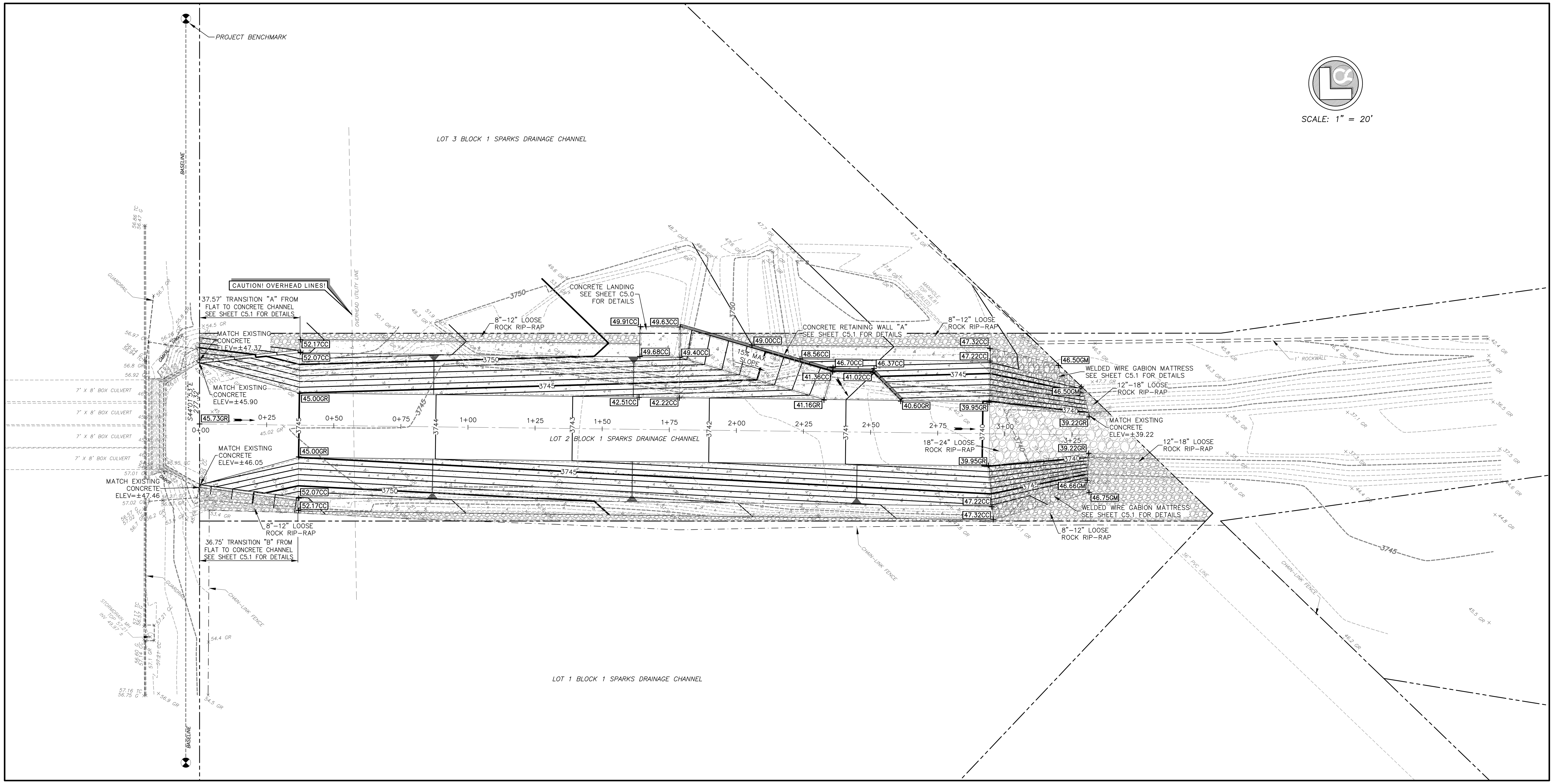
SCALE
Horiz. 1"=20'
Vert. N/A
Date 5/9/16
Design by DG
Drawn by DG
Chkd. by AHO/JCK
Appd. by JCK

PROJECT NAME
SPARKS ARROYO
DRAINAGE IMPROVEMENTS

Planning and Zoning Department

SHEET TITLE
SITE PLAN

SHEET NUMBER
SHT.C2.0 OF 9
SEQUENCE



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TEXAS EXCAVATION SAFETY SYSTEM	1-800-344-8377
TIME WARNER COMMUNICATION	775-7414

WARNING !
BEFORE YOU DIG
CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND IMPROVEMENTS IN PROJECT AREA

Texas811
Know what's below. Call before you dig.

Jun 27, 2016 – 1:00pm
S:\Draw\1603 Sparks Arroyo\1603 Bid Submittal-CURRENT\1603 Sht 3.0 Grading.dwg
aontiveros

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10. NO ON-SITE PROCESSING OF MATERIAL FOR COMMERCIAL OR RETAIL SALES SHALL BE ALLOWED. ON-SITE PROCESSING OF MATERIALS TO BE USED FOR PREPARATION OR CONSTRUCTION IMPROVEMENTS WITHIN THE SITE COVERED BY THE GRADING PERMIT SHALL BE ALLOWED.
11. WORK SHALL BE CONDUCTED IN A MANNER THAT PRESERVES AND DOES NOT OBSTRUCT, IMPEDE, OR INTERFERE WITH THE FLOW OF STORM WATER IN NATURAL DRAINAGE WAYS, UNIMPROVED CHANNELS OR WATERCOURSES, OR IMPROVED DITCHES, CHANNELS, OR CANALS IN SUCH A MANNER AS TO CAUSE FLOODING WHERE IT WOULD NOT OTHERWISE OCCUR.
12. MATERIAL STOCKPILING SHALL BE LIMITED TO FOUR (4) FEET HIGH WHEN GRADING OPERATIONS ARE IDLE FOR MORE THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS. STOCKPILING SHALL BE LIMITED TO TEN (10) FEET HIGH WHEN GRADING OPERATIONS ARE BEING CONDUCTED.
13. A TRAFFIC CONTROL PERMIT SHALL BE REQUIRED IF GRADING OPERATIONS WILL IMPACT TRAFFIC. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ACQUIRE SAID PERMIT. TRAFFIC CONTROL SHALL ADHERE TO ALL CITY OF SOCORRO REQUIREMENTS.
14. ANY USE OF VIBRATORY EQUIPMENT SHALL BE APPROVED IN WRITING BY THE CITY ENGINEER IN ADVANCE OF SUCH USE.
15. THE CITY ENGINEER MUST BE NOTIFIED NO LATER THAN 4:00 PM ONE DAY PRIOR TO ANY GRADING WORK, BACKFILL DENSITIES, INSPECTIONS AND/OR CONSTRUCTION OPERATIONS SUCH AS PLACEMENT OF CURB AND GUTTER, PAVEMENT, AND STORM SEWER STRUCTURES. ADDITIONAL ACTIVITY REQUIREMENTS/RESTRICTIONS MAY BE SPECIFIED BY THE DESIGN ENGINEER OF RECORD.
17. A COPY OF ALL CURRENT PERMITS REQUIRED FOR CONSTRUCTION SHALL BE MAINTAINED ON-SITE. THESE PERMITS MUST BE DISPLAYED IN A COMMON AND INCONSPICUOUS LOCATION ON THE JOB SITE.
18. NO GRADING OF ANY KIND WILL BE CONDUCTED ON LEGAL HOLIDAYS OR WEEKENDS (7:00 PM FRIDAY THROUGH 7:00 AM ON THE FOLLOWING MONDAY) UNLESS THE CITY OF SOCORRO HAS NOTIFIED THE CITY'S ENGINEERING DEPARTMENT BY NOON THE DAY BEFORE THE HOLIDAY, OR BY NOON ON FRIDAY. GRADING SHALL NOT BE PERMITTED WITHIN THREE HUNDRED (300) FEET OF A RESIDENTIALLY ZONED AREA BEFORE 7:00 AM OR AFTER 7:00 PM ON WEEKENDS OR HOLIDAYS.
19. INSTALLATION OF A TRENCH SAFETY SYSTEM IS REQUIRED FOR ALL TRENCHES EXCEEDING A DEPTH OF FIVE FEET (5') AND MUST CONFORM TO THE CITY OF SOCORRO DESIGN STANDARDS AS WELL AS OSHA REQUIREMENTS.
20. POSITIVE DRAINAGE SHALL BE PROVIDED BY CONTRACTOR DURING ALL PHASES OF CONSTRUCTION AND GRADING.
21. THE OWNER SHALL BE RESPONSIBLE FOR THE PREPARATION AND SUBMITTAL OF ALL PERMITTING NECESSARY FOR EARTHWORK OPERATIONS AND STORM WATER POLLUTION CONTROL.
22. WHERE A DRAINAGE WAY WILL BE CROSSED BY CONSTRUCTION VEHICLES REGULARLY DURING CONSTRUCTION, A TEMPORARY CROSSING SHALL BE CONSTRUCTED.
23. ALL CONCRETE JOINTS INCLUDING EXPANSION, CONSTRUCTION CONTROL, AND SAWCUT WILL CONFORM TO ACI 302.IR-89 & 360R-92 CODE. EXPANSION JOINTS SHOULD BE SEALED WITH A POLYURETHANE SEALANT SO THAT MOISTURE INFILTRATION INTO THE SUBGRADE SOILS AND RESULTANT CONCRETE DETERIORATION AT THE JOINT IS MINIMIZED.
24. FILLS SHALL BE PLACED AND COMPACTED TO PRODUCE A STRUCTURALLY STABALIZED SLOPE IN ACCORDANCE WITH DESIGN STANDARDS OF THE CITY OF SOCORRO AND THE GEOTECHNICAL INVESTIGATION REPORT.
26. CONSTRUCTION EQUIPMENT SHALL BE KEPT OUT OF WATERCOURSES EXCEPT WHEN NECESSARY TO PERFORM WORK ON THE APPROVED PLANS. WHERE IN-CHANNEL WORK IS DESIGNATED ON THE APPROVED PLANS, PRECAUTIONS SHALL BE TAKEN TO STABILIZE THE WORK AREA DURING CONSTRUCTION TO MINIMIZE EROSION AS SHOWN ON THE PLANS. THE CHANNEL, INCLUDING THE BED AND THE BANKS, SHALL ALWAYS BE RE-STABILIZED IMMEDIATELY AFTER THE IN-CHANNEL WORK IS COMPLETED.

LEGEND

TC	TOP OF CURB
G	GUTTER
P	PAVEMENT
GR	NATURAL GROUND
CC	CONCRETE
PP	POWER POLE
LP	LIGHT POLE
WV	WATER VALVE
WM	WATER METER
FH	FIRE HYDRANT
SP	0.2'ø SIGNPOST
GP	GUARDPOST
GM	GAS METER
GV	GAS VALVE
SCO	SEWER CLEANOUT
TMH	TELEPHONE MANHOLE
TBX	TELEPHONE PEDESTAL
EBX	ELECTRIC BOX
CATV	CABLE TV PEDESTAL
TW	TOP OF WALL
MBX	MAILBOX
TSBX	TRAFFIC SIGNAL BOX
ASV	ANTI-SIPHON VALVE
ICV	IRRIGATION CTRL VALVE
FOMKR	FIBER OPTIC CBL MRKR
TMKR	TELEPHONE MARKER
WLMK	WATER LINE MARK
	PROPERTY LINE
	DIRECTION OF DRAINAGE FLOW
3720	EXISTING CONTOUR ELEVATION
3725	PROPOSED CONTOUR ELEVATION
	TOE OF SLOPE
47.22CC	PROPOSED CONCRETE ELEVATION
39.95GR	PROPOSED GROUND ELEVATION
46.66GM	PROPOSED GABION MATTRESS ELEVATION

FLOOD ZONE DESIGNATION: ACCORDING TO FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP PANEL 480212-0237B, DATED SEPTEMBER 4, 1991, THIS PROPERTY LIES IN FLOOD HAZARD ZONE "AE" BASE FLOOD ELEVATIONS DETERMINED.

LEGAL DESCRIPTION: SPARKS DRAINAGE CHANNEL, BEING ALL OF LOT 2, BLOCK 1 SPARKS ADDITION
EL PASO, EL PASO COUNTY, TEXAS.

BID SET

REFERENCE BENCHMARK: NGS STAINLESS STEEL ROD P1517 AT THE INTERSECTION OF LOOP 375 AND SOUTHSIDE ROAD. ELEVATION = 3668.84 (NAVD 88)

PROJECT BENCHMARK: SET 5/8" REBAR 134.33± EAST FROM THE EAST END OF HEADWALL AS SHOWN HEREON. ELEVATION = 3755.25 (NAVD 88)

REFERENCES -- BENCH MARKS

BENCHMARK: CITY MONUMENT AT THE INTERSECTION OF THE CENTERLINE OF VALLEY RIDGE DRIVE AND THE SOUTHERLY RIGHT-OF-WAY OF STOCKYARD DRIVE BEARS N72°25'22"W, A DISTANCE OF 822.28 FEET FROM THE PROJECT BENCHMARK, SHOWN HEREON..
ELEVATION = 3722.40 (NAVD 88)

DATE	REVISIONS	BY
6/28/16	Bid Set	JCK
5/9/16	1st City Submittal	JCK

FIRM'S NAME
csa design group, inc.
Texas Registered Engineering Firm F-9997
1845 Northwestern Dr. Ste C
El Paso, Texas 79912
tel [915] 877.4155
fax [915] 877.4334
www.csaengineers.com

FIRM'S SEAL
STATE OF TEXAS
JOHN C. KARLSRUHER
53878
REGISTERED PROFESSIONAL ENGINEER
06/28/16

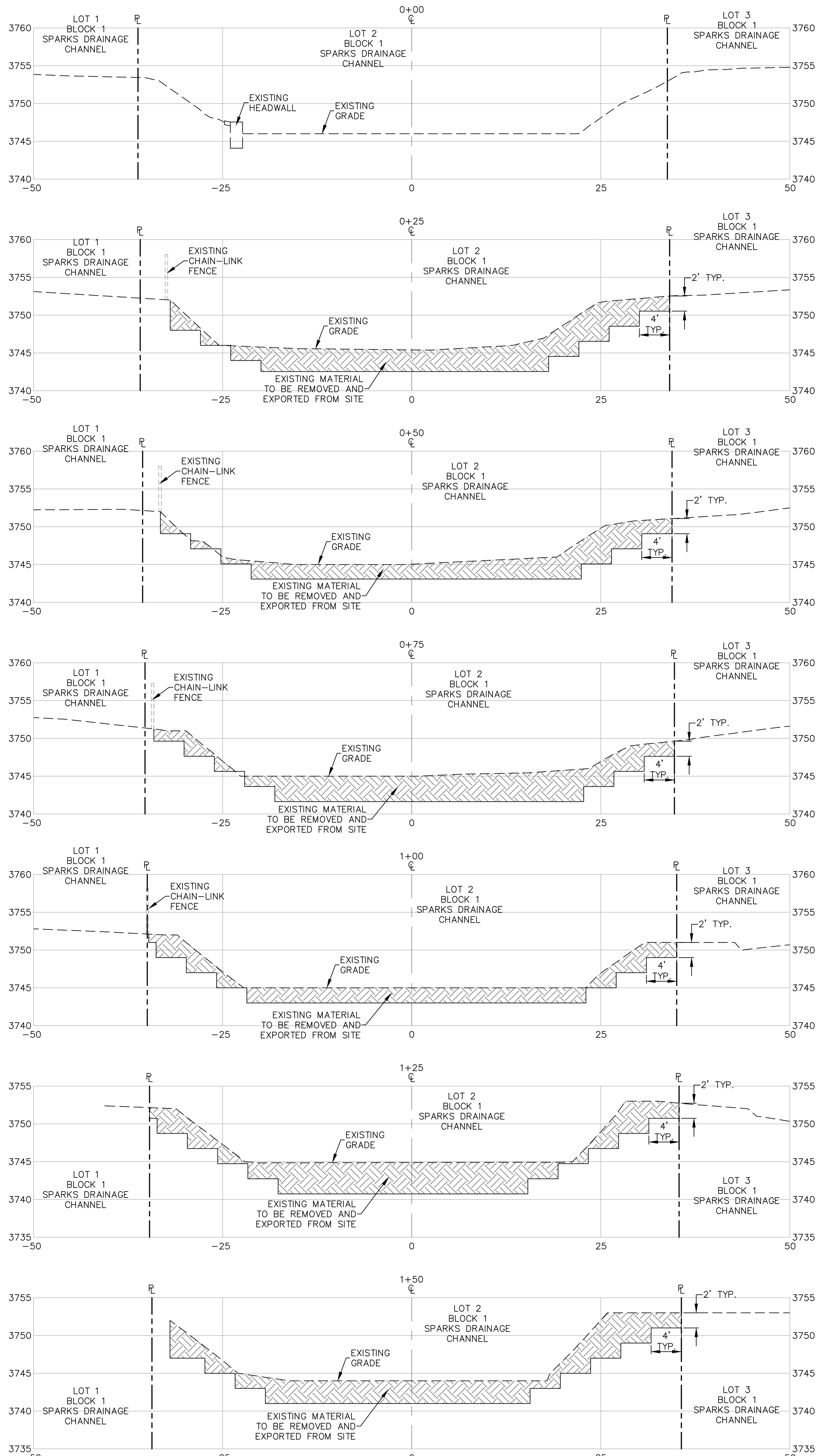
SCALE
Horiz. 1"=20'
Vert. N/A
Date 5/9/16
Design by DG
Drawn by DG
Chkd. by AHO/JCK
Appd. by JCK

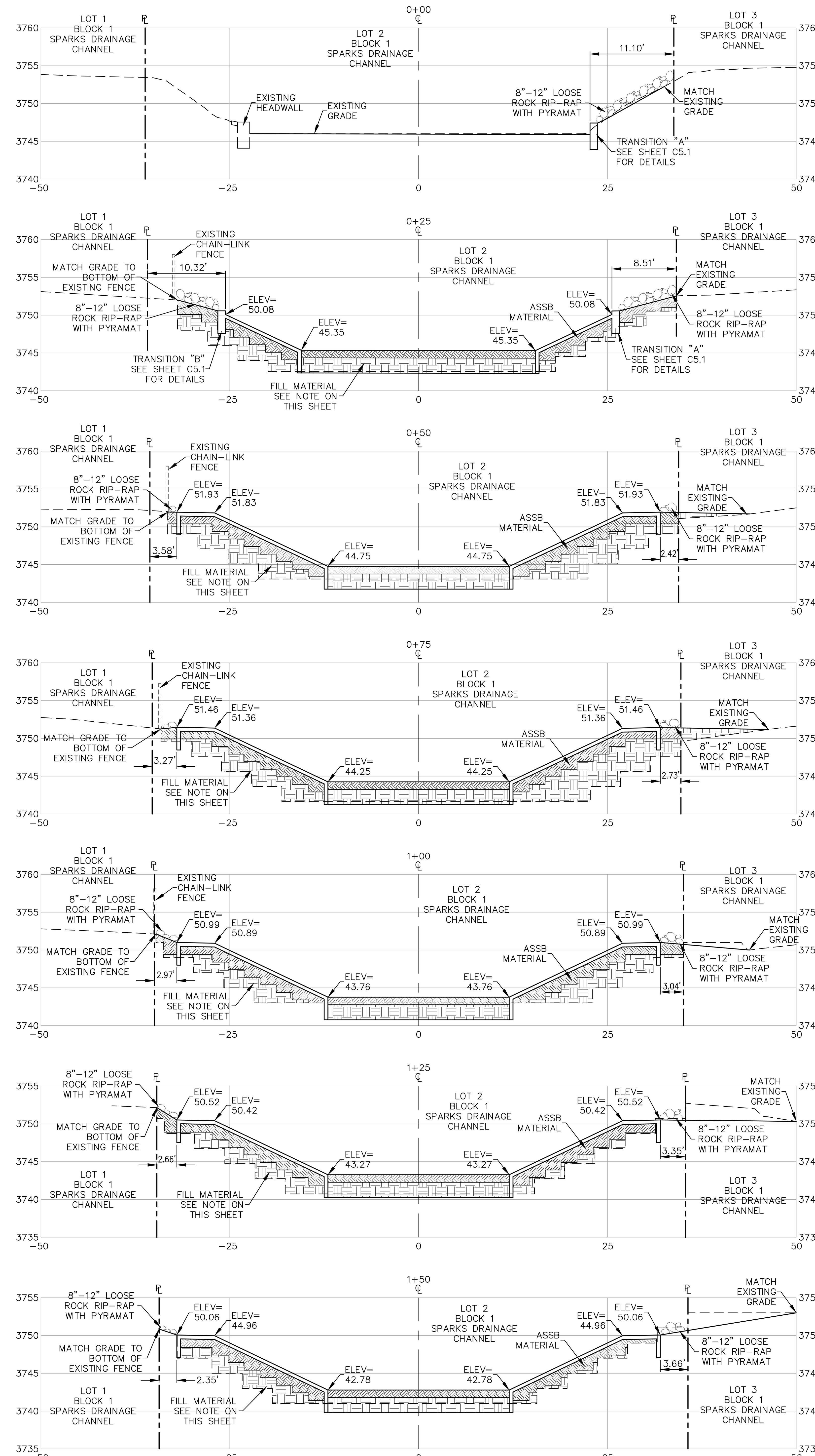
PROJECT NAME
SPARKS ARROYO
DRAINAGE IMPROVEMENTS

Planning and Zoning Department
860 N. Rio Vista Socorro, Texas 79927 Tel. (915)872-8531 Fax (915) 872-8673

SHEET TITLE
GRADING PLAN

SHEET NUMBER
SHT. C3.0 OF 9
SEQUENCE





WARNING ! BEFORE YOU DIG
CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND IMPROVEMENTS IN PROJECT AREA

Know what's below. Call before you dig.

GENERAL BACKFILL SOIL MATERIALS FOR INITIAL ROUGH GRADING AND FILLING TO FORM ARROYO SLOPES SHALL BE IMPORTED FROM A BORROW PIT TO BE DESIGNATED BY THE CITY OF SOCORRO AND INSTALLED IN 8" COMPACTED LIFTS

SEE SHEET C5.0-C5.2 FOR DETAILS

BID SET

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FIRM'S SEAL
STATE OF TEXAS
JOHN C. KARLSRUHER
53878
REGISTERED PROFESSIONAL ENGINEER
6/28/16

SCALE
Horiz. 1"=10'
Vert. N/A
Date 5/9/16
Design by DG
Drawn by DG
Chkd. by AHO/JCK
Appd. by JCK

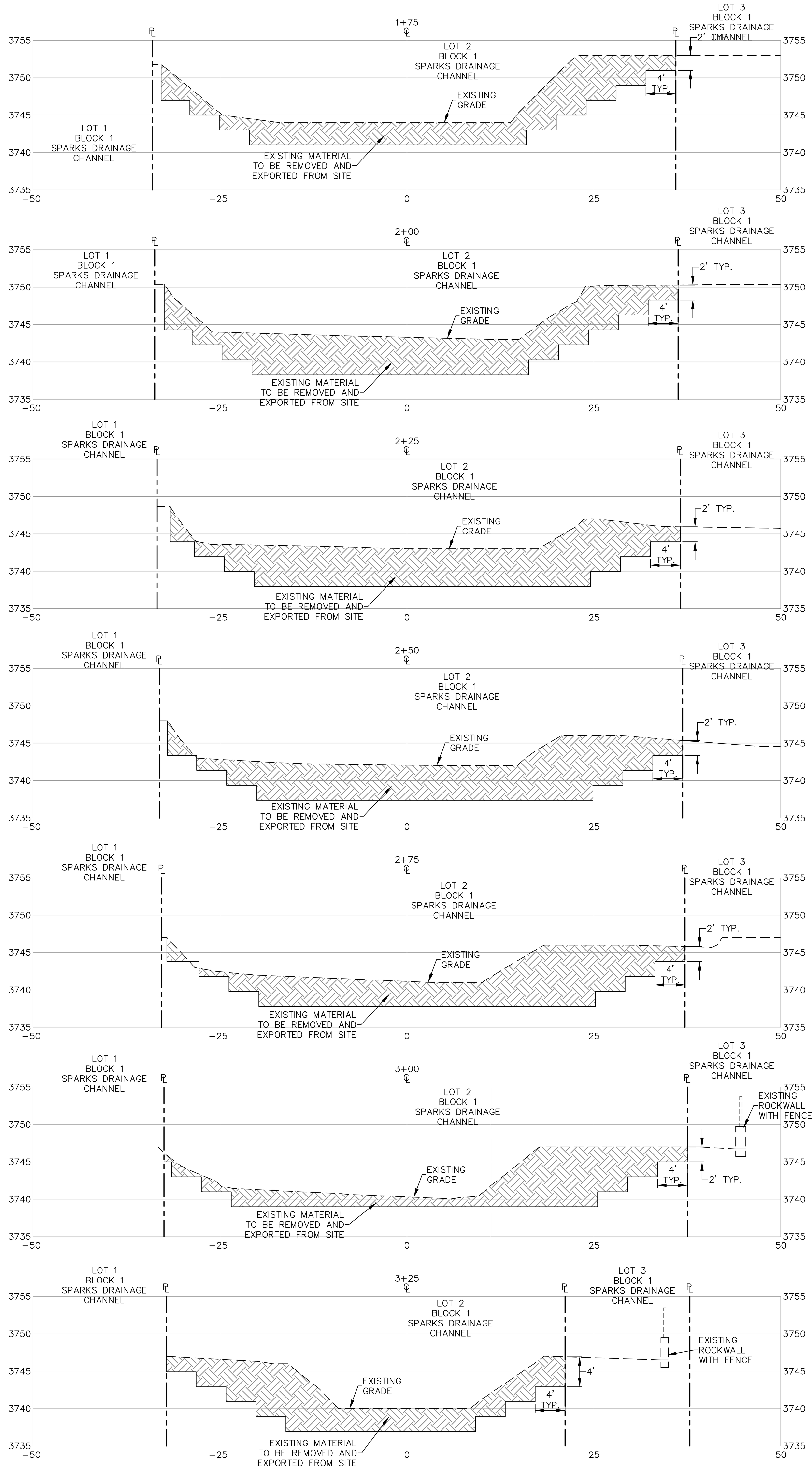
PROJECT NAME
SPARKS ARROYO DRAINAGE IMPROVEMENTS

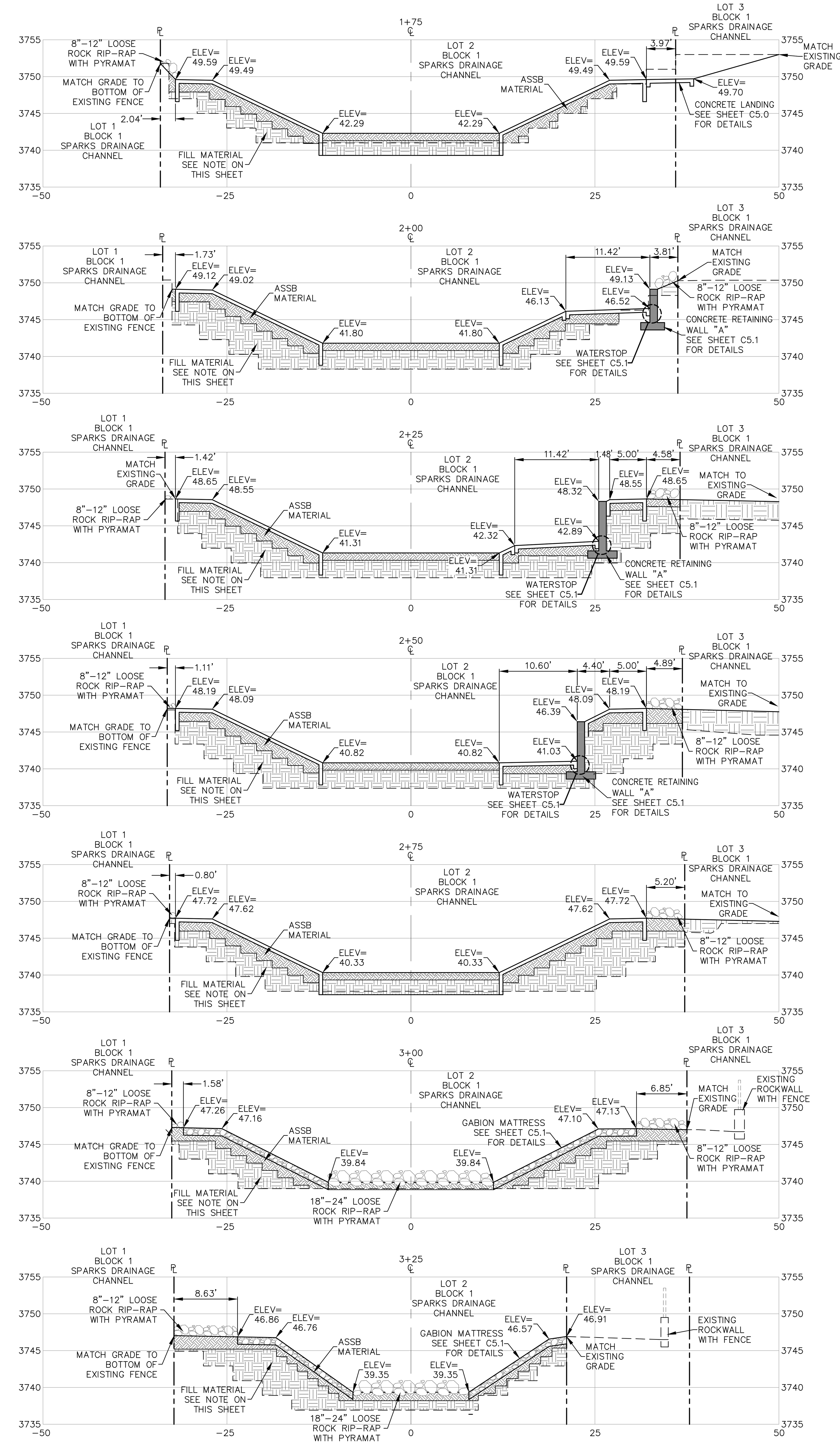
Planning and Zoning Department
860 N. Rio Vista Socorro, Texas 79927 Tel. (915)872-8531 Fax (915) 872-8673

CITY OF SOCORRO, TEXAS 1691 A CITY WITH A MISSION

SHEET TITLE
CROSS SECTIONS

SHEET NUMBER
SHT.C4.0 OF 9
SEQUENCE





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Texas811
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JOHN C. KARLSRUHER 53878 REGISTERED PROFESSIONAL ENGINEER

SCALE
Horiz. 1"=10'
Vert. N/A
Date 5/9/16
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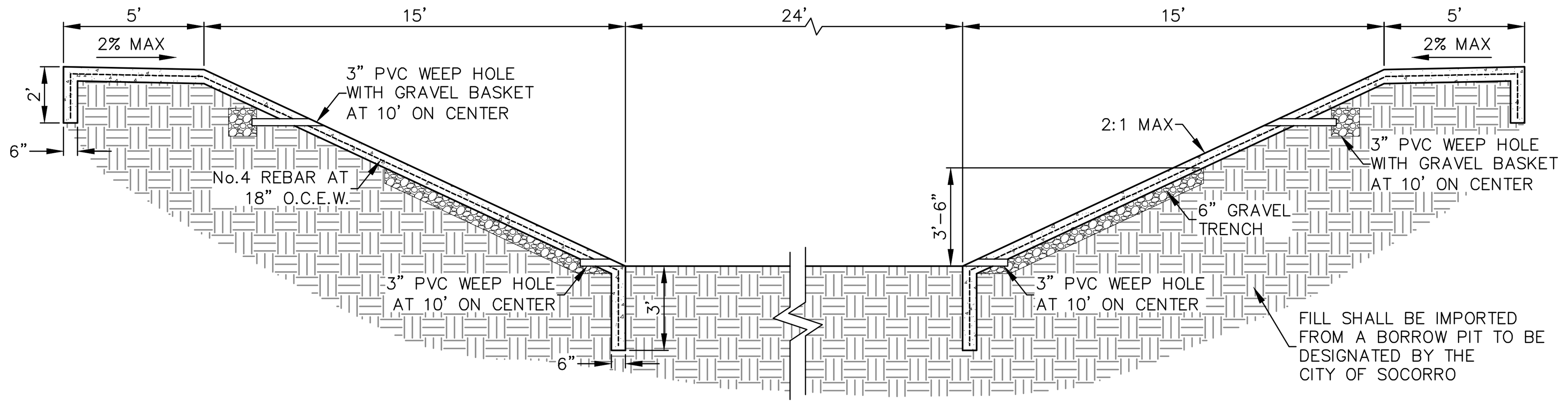
PROJECT NAME
SPARKS ARROYO DRAINAGE IMPROVEMENTS

Planning and Zoning Department

SHEET TITLE
CROSS SECTIONS

SHEET NUMBER
SHT. C4.1 OF 9
SEQUENCE



CONCRETE LINED CHANNEL DETAIL

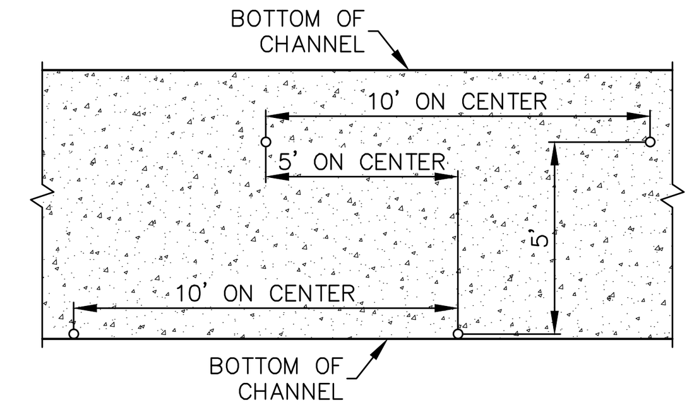
SCALE: 1/2" = 1'-0"

NOTES:

1. CONCRETE TO HAVE COMPRESSIVE STRENGTH OF 3,300 PSI AT 28 DAYS.
2. CONCRETE SHALL HAVE TRANSVERSE JOINTS AT WEEPHOLE LOCATIONS. REDWOOD EXPANSION JOINTS ARE REQUIRED A MAXIMUM OF EVERY 200 FEET.
3. ADDITIONAL LAYER OF WEEP HOLES WILL BE REQUIRED WHERE RIP-RAP IS GREATER THAN 5' VERTICAL HEIGHT. WEEPHOLES SHALL BE STAGGERED 5' ON CENTER.
4. CONTINUOUS GRAVEL TRENCH 6" THICK SHALL BE WRAPPED IN 28 MIL GEOTEXTILE FABRIC OR APPROVED EQUAL. DRAINAGE MATERIAL TO CONSIST OF GRAVEL GRADED WITHIN THE FOLLOWING LIMITS:

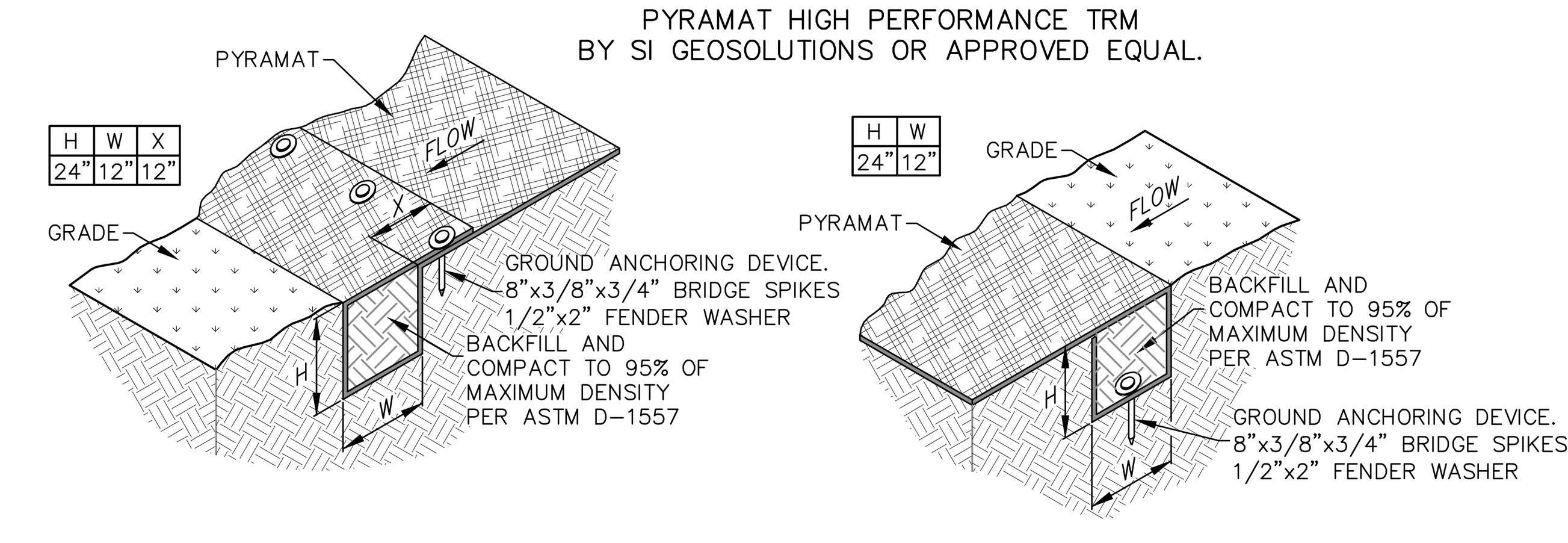
SIEVE SIZE	% BY WEIGHT PASSING
1 INCH	100
3/4 INCH	90–100
3/8 INCH	20–55
No. 4	0–5

5. FENCE POSTS ARE NOT PERMITTED IN THE CONCRETE.
6. THE UP AND DOWNSTREAM ENDS SHALL HAVE A 3' DEEP TOE WALL, UNLESS CONNECTING TO ANOTHER STRUCTURE. THE TOE SHALL EXTEND FROM THE TOP OF BANK TO THE BOTTOM OF THE RIP-RAP.



WEEP HOLE DETAIL

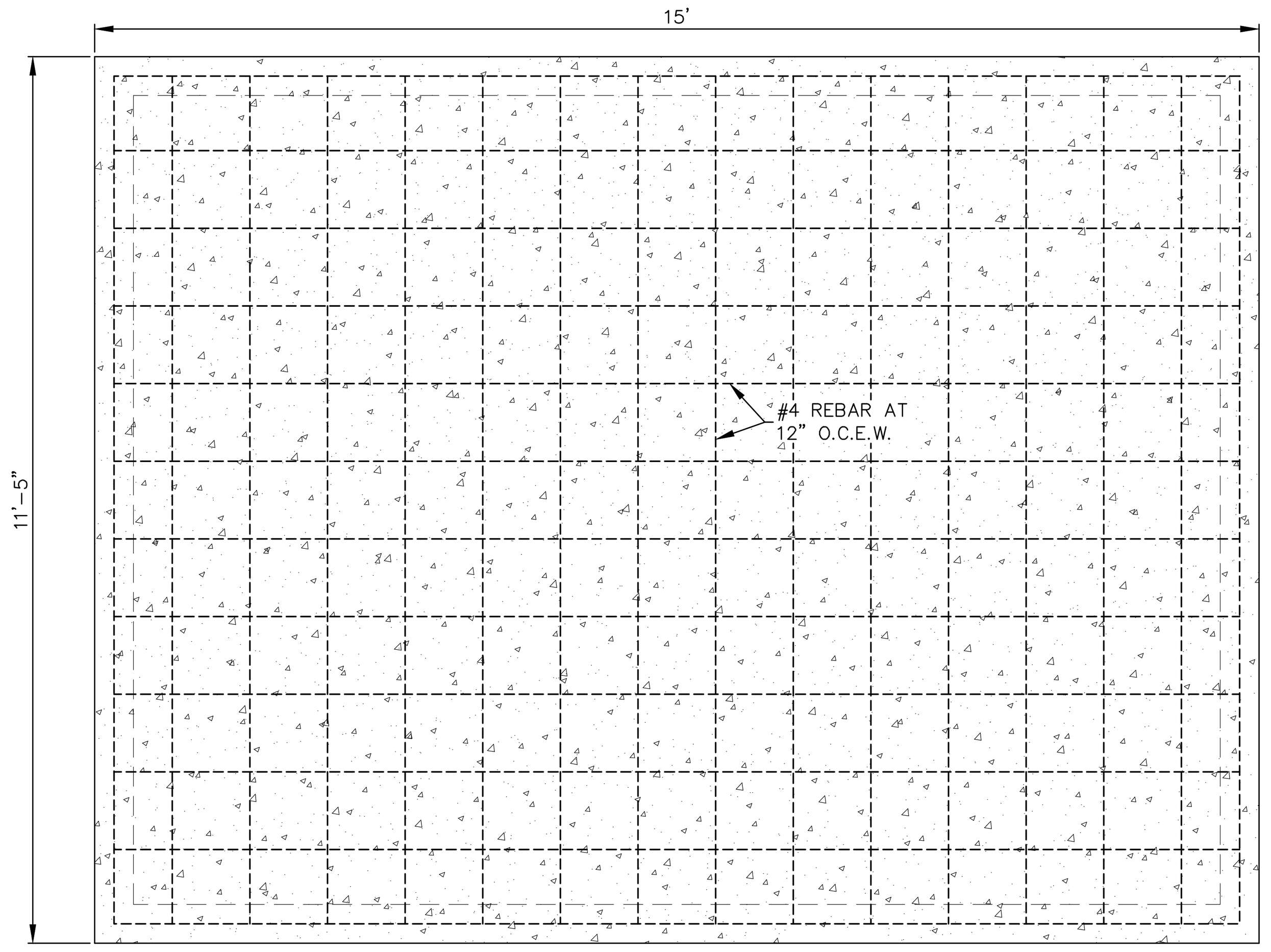
SCALE: 1/2" = 1'-0"

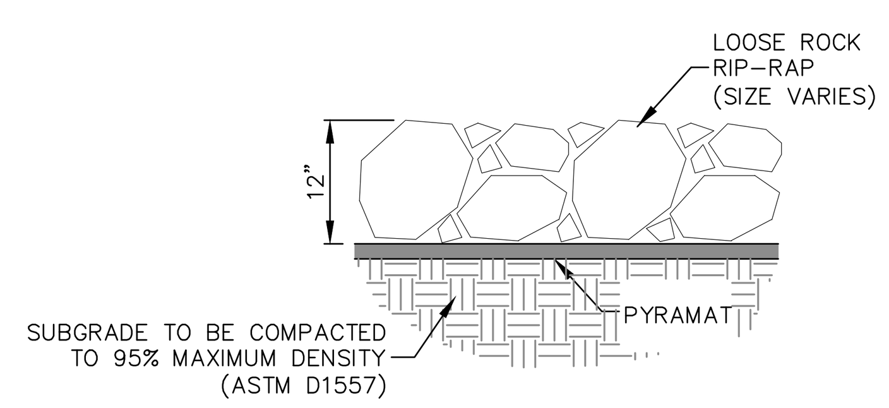


1. PRIOR TO INSTALLATION, SUBGRADE SHALL BE UNIFORM AND SMOOTH. REMOVE ALL ROCKS, CLODS, VEGETATION OR OTHER OBJECTS SO THE INSTALLED MAT WILL HAVE DIRECT CONTACT WITH SOIL SURFACE. SURFACE TO RECEIVE MAT SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% PER ASTM D-1557.
2. EXCAVATE FOOTING TRENCH AS SHOWN IN DETAIL AND INSTALL TOP END OF MAT INTO TRENCH AND SECURE TO BOTTOM USING GROUND ANCHORING DEVICES SPACED EVERY 12 INCHES MINIMUM. BACKFILL AND COMPACT SOIL INTO TRENCH.
3. OVERLAPS SHALL BE 12" MINIMUM AND ANCHORED EVERY 18 INCHES ALONG THE OVERLAP. SECURE USING GROUND ANCHORING DEVICES. OVERLAPS ARE SHINGLED AWAY FROM PREVAILING WINDS.
4. UNROLL MAT IN A MANNER TO MAINTAIN DIRECT CONTACT WITH SOIL. SECURE MAT TO GROUND SURFACE USING GROUND ANCHORING DEVICES.
5. ONCE MAT IS PINNED INTO PLACE, 4" RESERVED TOPSOIL FROM CLEARING AND GRUBBING OPERATIONS WITH 3" MAX DIAMETER SCREENED COBBLE FROM MATERIALS ON-SITE, PLACED ON TOP OF EROSION CONTROL FABRIC AND COMPACTED TO 85% MAXIMUM DENSITY PER ASTM D-1557.

EROSION CONTROL FABRIC INSTALLATION

N.T.S



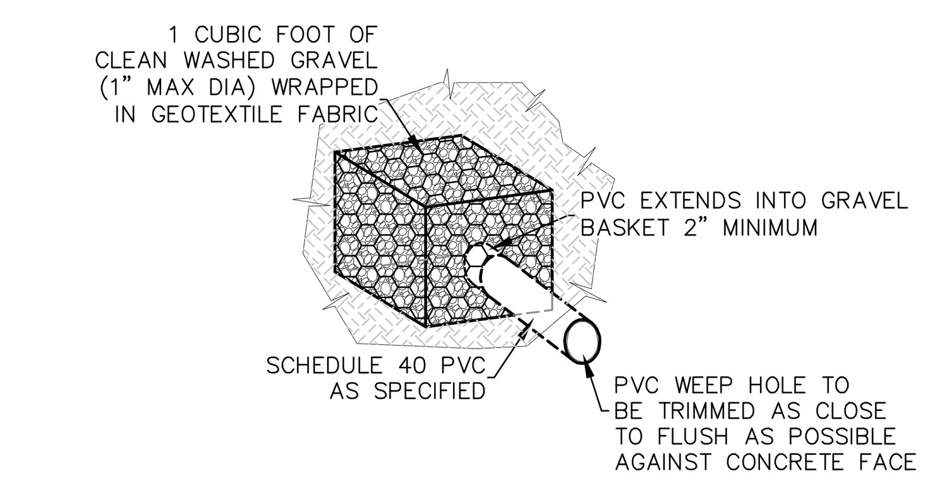


NOTES:

1. SMALLER STONES TO BE USED TO FILL IN GAPS.
2. RIP-RAP TO BE EXTENDED TO AND INTO INVERT OF BASIN TO PROTECT FROM EROSION.
3. PYRAMAT HIGH PERFORMANCE TRM BY SI GEOSOLUTIONS OR APPROVED EQUAL.

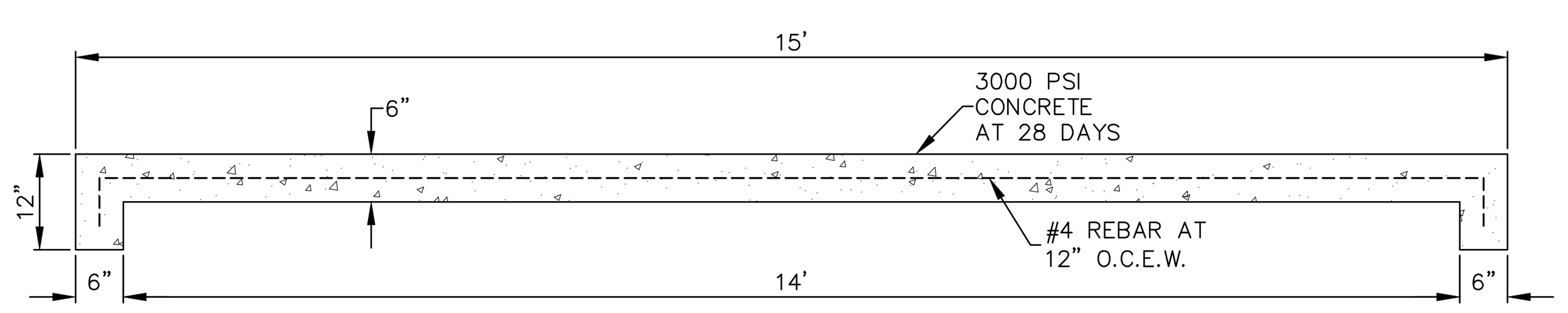
RIP-RAP DETAIL

SCALE: 1"=1'-0"



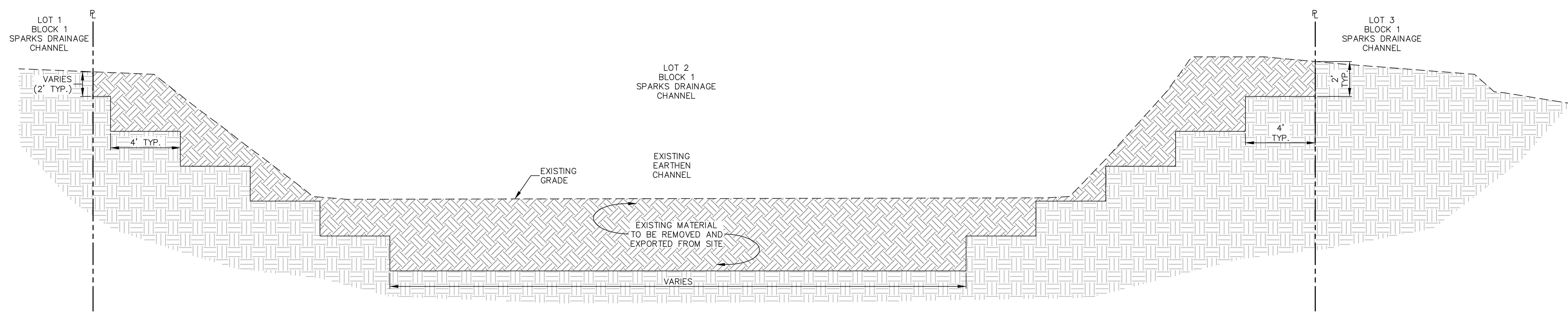
WEEP HOLES WITH GRAVEL BASKET

N.T.S.



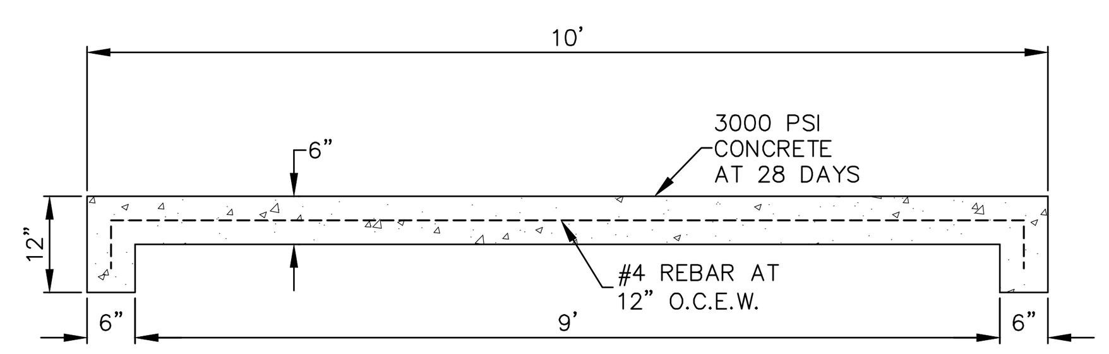
CONCRETE LANDING

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



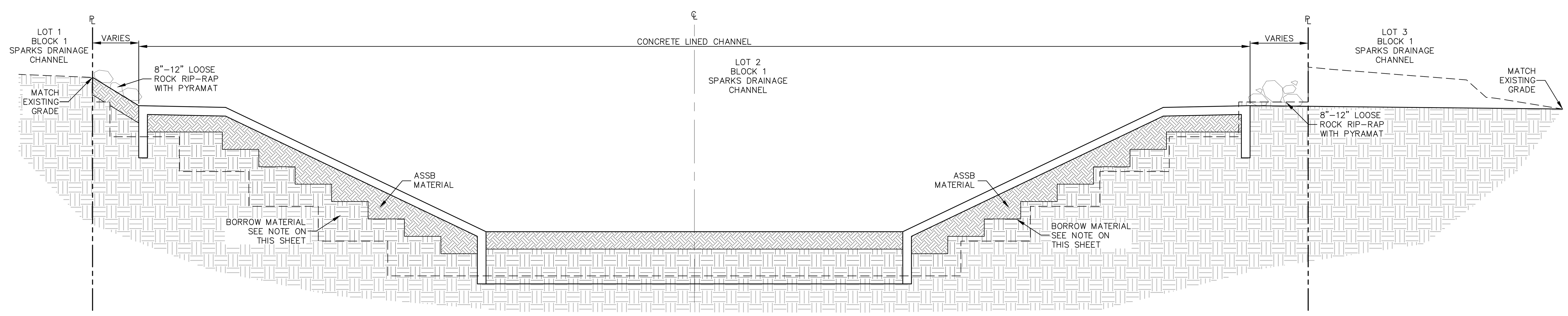
BENCHING/NOTCHING DETAIL

SCALE: 1"=1'-0"



CONCRETE RAMP

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



BACKFILL NOTES:

1. ALL FILL SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% PER ASTM D-1557
2. FOR RECOMMENDATIONS REFER TO THE GEOTECHNICAL INVESTIGATION REPORT.
3. IMMEDIATELY PRIOR TO PLACEMENT OF FILL, THE ENTIRE EARTH SURFACE ON OR AGAINST WHICH FILL IS TO BE PLACED SHALL BE THOROUGHLY SCARIFIED TO A DEPTH OF 6 INCHES.
4. ALL FILLING, COMPACTION, NOTCHING, SCARIFYING AND BREAKING OF GROUND SURFACE SHALL BE DONE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT BEING CONSTRUCTED.
5. GENERAL BACKFILL SOIL MATERIALS FOR INITIAL ROUGH GRADING AND FILLING TO FORM ARROYO SLOPES SHALL BE IMPORTED FROM A BORROW PIT TO BE DESIGNATED BY THE CITY OF SOCORRO AND INSTALLED IN 8" COMPACTED LIFTS.

ASSB MATERIAL NOTES:

1. THE FINAL 12 INCHES OF THE ARROYO SLOPES SURFACE SHALL BE FORMED WITH APPROVED SLOPE SELECT BACKFILL (ASSB) SOILS.
2. BLENDING OF NATIVE SOILS WITH IMPORTED BORROW SOILS OR SELECT FILL SOILS MAY BE ALSO PERFORMED PROVIDED THAT THESE SOILS MEET THE SPECIFIED REQUIREMENTS OF ASSB SOIL MATERIALS.
3. ASSB SHALL CONSIST OF GRANULAR SANDS WHICH ARE FREE OF CLAY LUMPS, DELETERIOUS MATERIALS, ORGANIC MATERIAL, COBBLES OR BOULDERS OVER 4 INCHES IN NOMINAL SIZE.
4. ASSB SHALL HAVE A LIQUID LIMIT LESS THAN 40 AND A PLASTICITY INDEX OF 7 TO 15.
5. ASSB SHALL EXHIBIT A MAXIMUM DRY DENSITY OF AT LEAST 125 PCF.
6. ASSB SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% PER ASTM D-1557.

ARROYO SLOPE SELECT BACKFILL (ASSB)	
GRADATION REQUIREMENTS	
SIEVE SIZE (SQUARE OPENING)	% PASSING BE WEIGHT
3 INCHES	100
3/4 INCHES	70–100
No. 4	40–100
No. 200	13–45

BACKFILL DETAIL

SCALE: 1"=1'-0"

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BID SET

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STATE OF TEXAS
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6/28/16

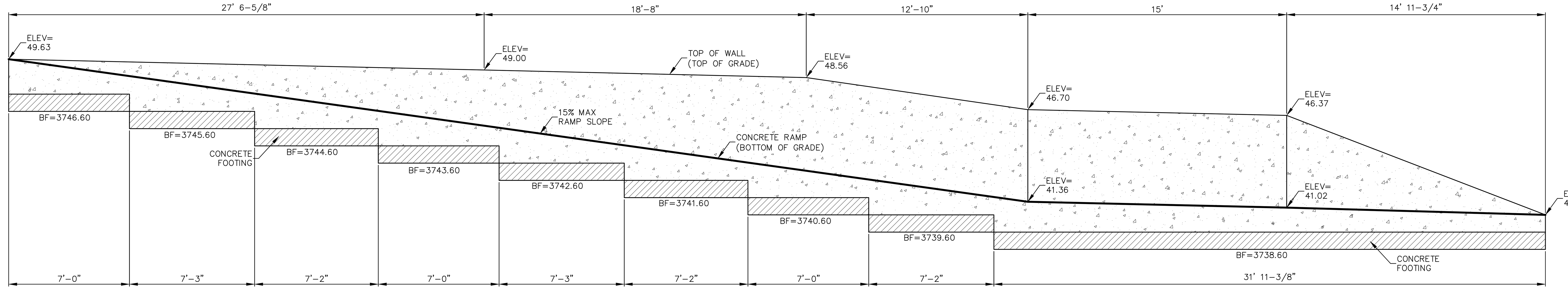
SCALE
Horiz. AS NOTED
Vert. N/A
Date 5/9/16
Design by DG
Drawn by DG
Chkd. by AHO/JCK
Appd. by JCK

PROJECT NAME
SPARKS ARROYO DRAINAGE IMPROVEMENTS

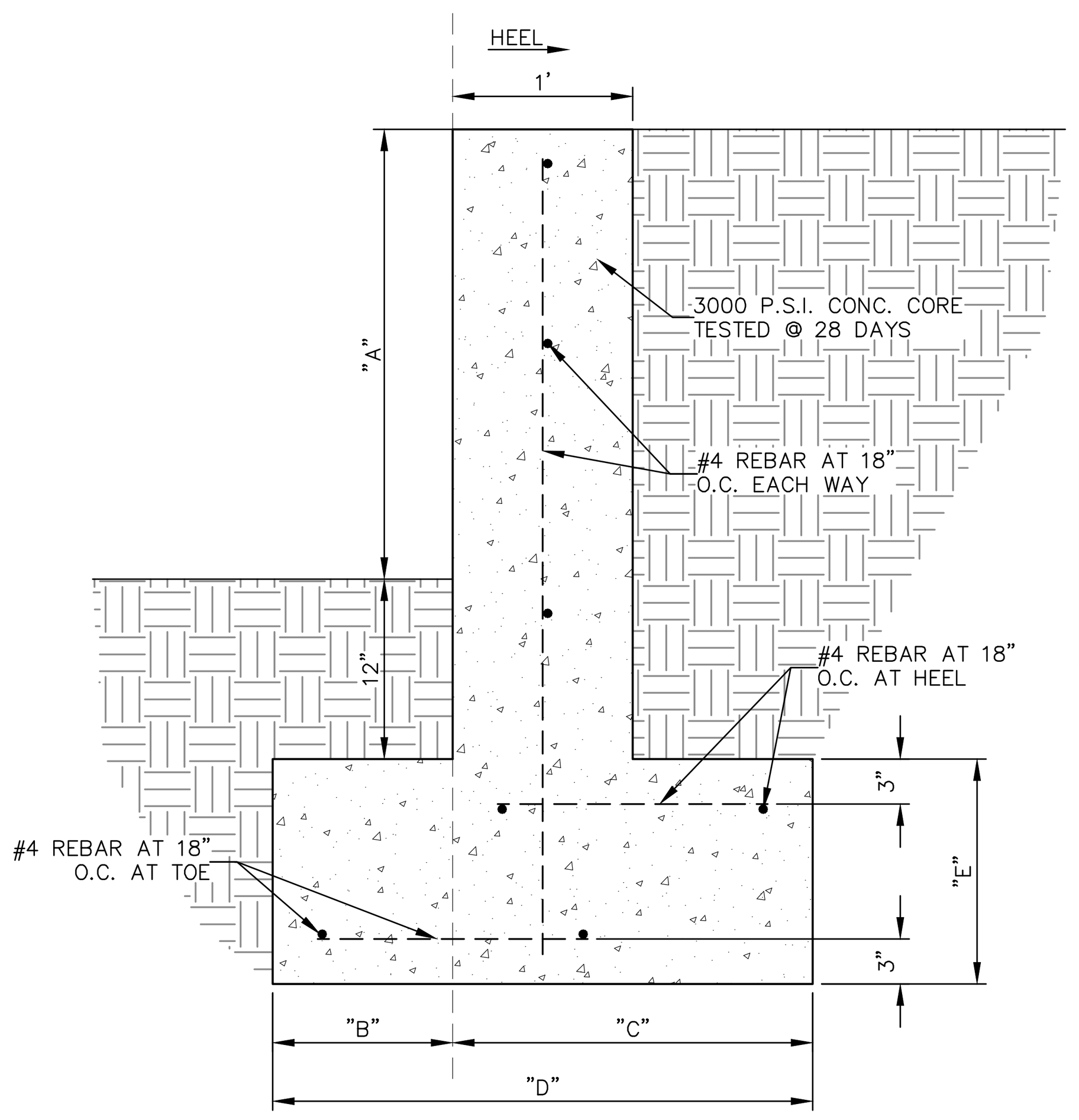
Planning and Zoning Department

SHEET TITLE
TYPICAL DETAILS

SHEET NUMBER
SHT. C5.0 OF 9
SEQUENCE

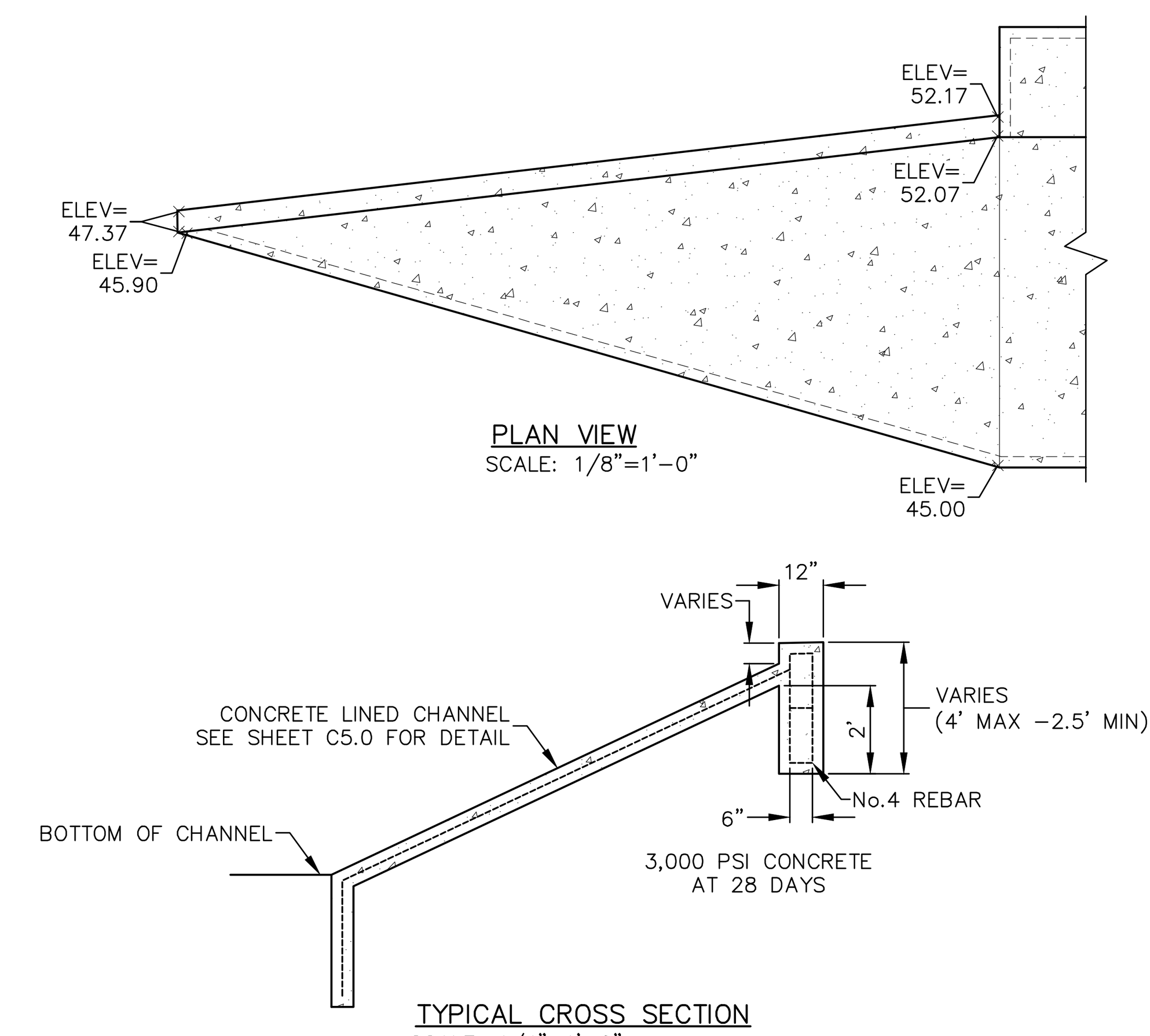


CONCRETE RETAINING WALL "A" PROFILE
SCALE: 1/4"=1'-0"

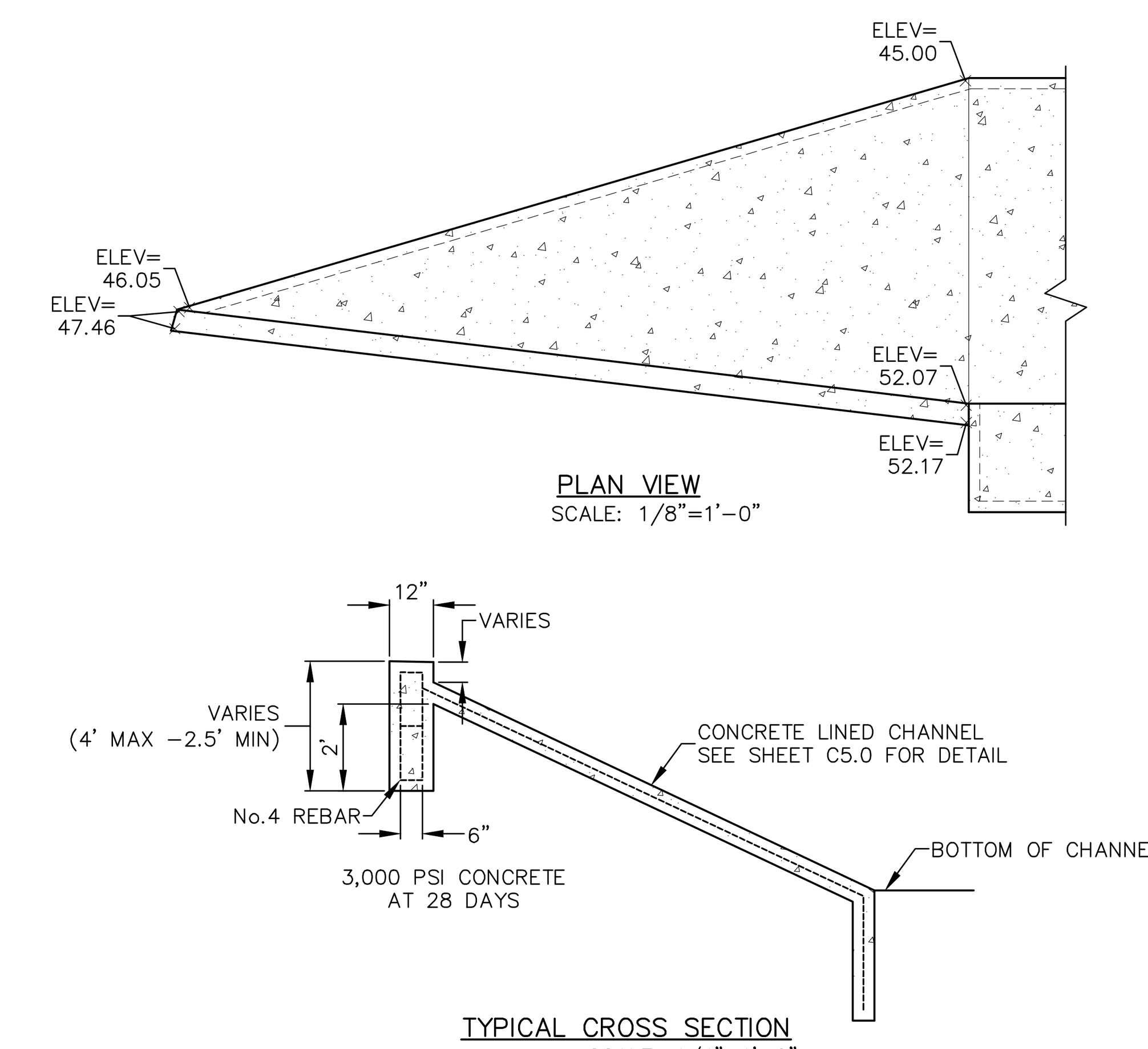


"A"	"B"	"C"	"D"	"E"
0'-0" TO 1'-0"	0'-0"	1'-0"	1'-0"	1'-0"
1'-0" TO 2'-0"	0'-9"	1'-6"	2'-3"	1'-0"
2'-0" TO 3'-0"	0'-9"	1'-6"	2'-3"	1'-0"
3'-0" TO 4'-0"	1'-0"	1'-9"	2'-9"	1'-0"
4'-0" TO 5'-0"	1'-3"	2'-0"	3'-3"	1-0"
5'-0" TO 6'-0"	1'-6"	2'-6"	4'-0"	1'-0"

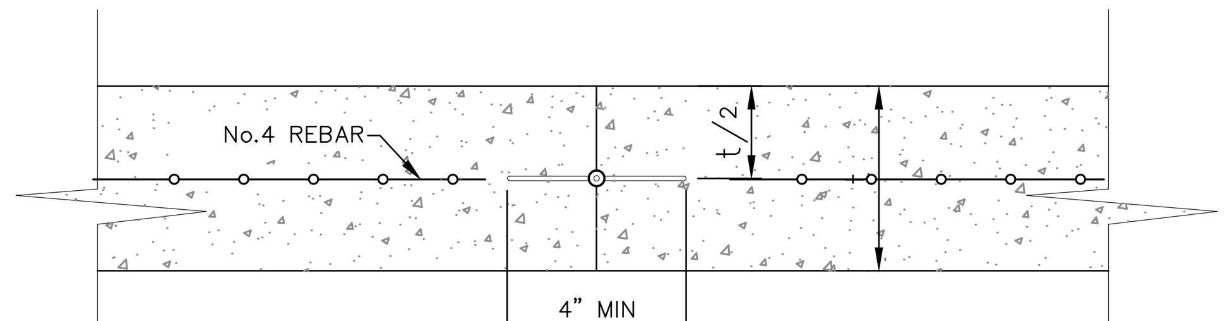
CONCRETE RETAINING WALL "A" DETAIL
SCALE: 1"=1'-0"



TRANSITION "A"
SCALE: AS NOTED

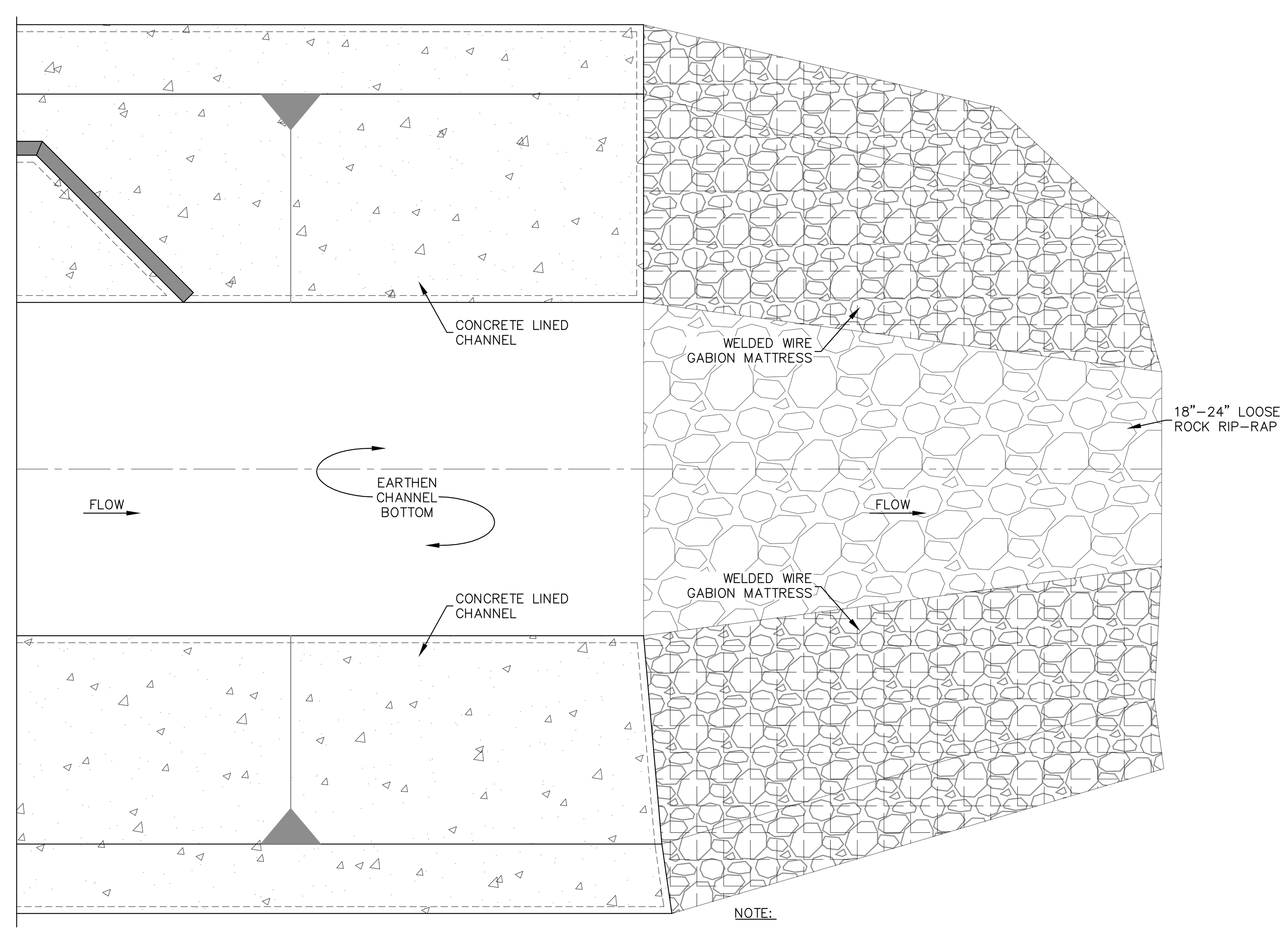


TRANSITION "B"
SCALE: 1/8"=1'-0"



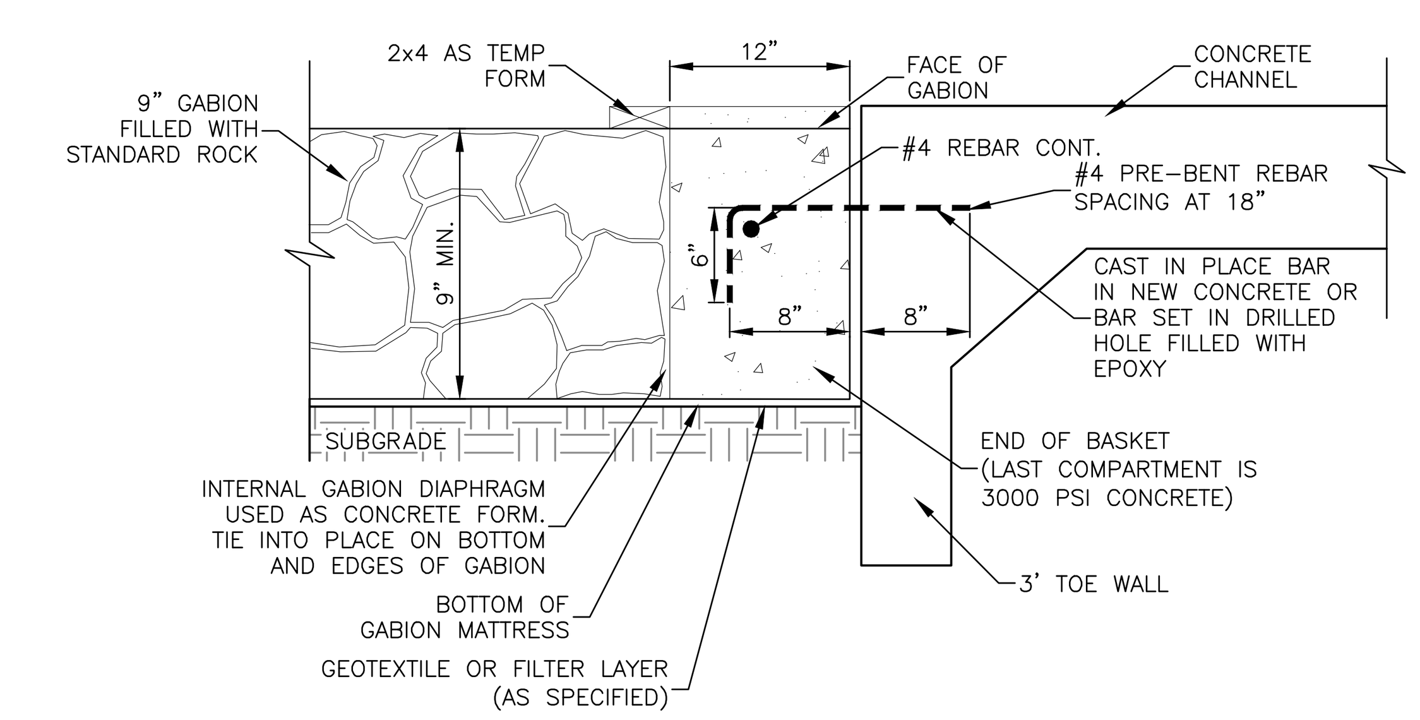
WATERSTOP SHALL BE GREENSTREAK PVC MATERIAL, SPECIFICATIONS GRADE, 6" x 1/8" AND SERRATED WITH CENTERBULB OR APPROVED SUBSTITUTION BY ENGINEER

WATERSTOP DETAIL
N.T.S.



CONCRETE LINED CHANNEL WITH GABION MATTRESS
SCALE: 1/2" = 1'-0"

NOTE:
REFER TO TECHNICAL SPECIFICATIONS No. 31375 OF THE CONTRACT DOCUMENTS FOR REQUIRED GABION MATTRESSES.



GABION MATTRESS TO CONCRETE ATTACHMENT DETAIL
SCALE: NTS

WARNING ! BEFORE YOU DIG
CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND IMPROVEMENTS IN PROJECT AREA

REFERENCE BENCHMARK: NGS STAINLESS STEEL ROD P1517 AT THE INTERSECTION OF LOOP 375 AND SOUTHSIDE ROAD. ELEVATION = 3668.84 (NAVD 88)

PROJECT BENCHMARK: SET 5/8" REBAR 134.33± EAST FROM THE EAST END OF HEADWALL AS SHOWN HEREON. ELEVATION = 3755.23 (NAVD 88)

REFERENCES — BENCH MARKS
BENCHMARK: CITY MONUMENT AT THE INTERSECTION OF THE CENTERLINE OF VALLEY RIDGE DRIVE AND THE SOUTHERLY RIGHT-OF-WAY OF STOCKYARD DRIVE BEARS N72°25'22"W, A DISTANCE OF 822.28 FEET FROM THE PROJECT BENCHMARK, SHOWN HEREON. ELEVATION = 3722.40 (NAVD 88)

DATE	REVISIONS	BY
6/28/16	Bid Set	JCK
5/9/16	1st City Submittal	JCK

FIRM'S NAME
csa design group, inc.
Texas Registered Engineering Firm F-9997
1845 Northwestern Dr. Ste C
El Paso, Texas 79912
tel (915) 877.4155
fax (915) 877.4334
www.csaengineers.com

FIRM'S SEAL
STATE OF TEXAS
JOHN C. KARLSRUHER
53878
REGISTERED PROFESSIONAL ENGINEER
6/28/16

SCALE
Horiz. AS NOTED
Vert. N/A
Date 5/9/16
Design by DG
Drawn by DG
Chkd. by AHD/JCK
Appd. by JCK

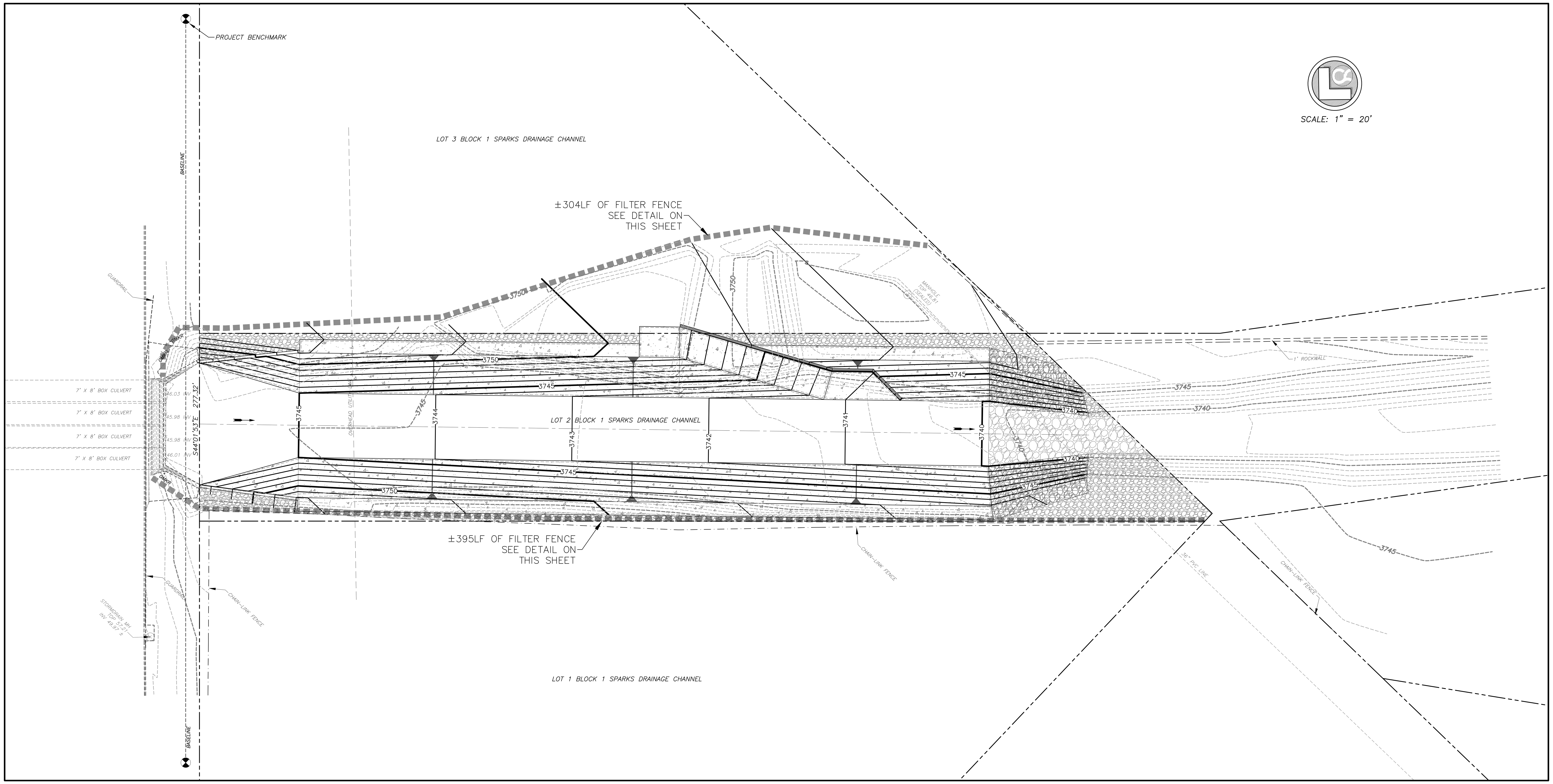
PROJECT NAME
SPARKS ARROYO DRAINAGE IMPROVEMENTS

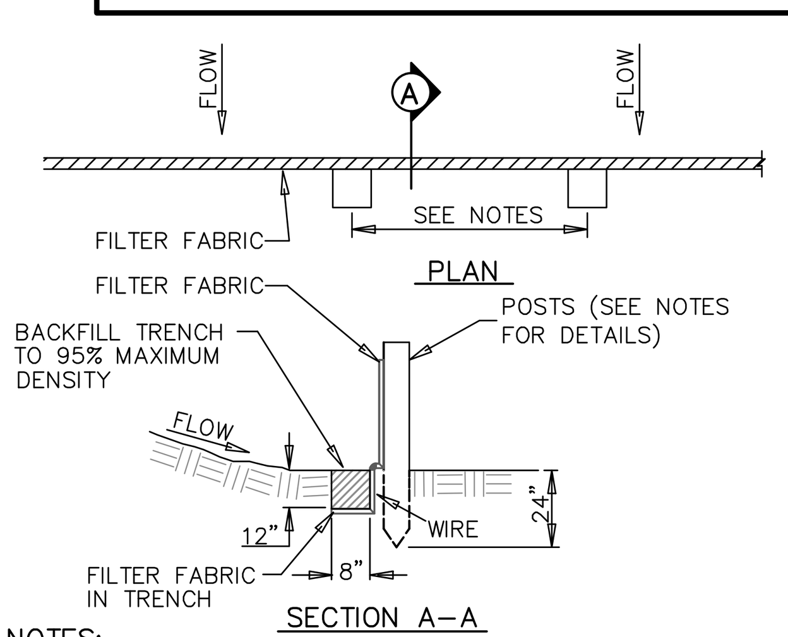
Planning and Zoning Department
860 N. Rio Vista Socorro, Texas 79927 Tel. (915)872-8531 Fax (915) 872-8673

SHEET TITLE
CONCRETE WALL AND GABION MATTRESS DETAILS

SHEET NUMBER
SHT. C5.1 OF 9
SEQUENCE

BID SET





NOTES:

1. THE FENCE REQUIRES FREQUENT INSPECTION AND PROMPT MAINTENANCE TO MAINTAIN ITS EFFECTIVENESS.
2. INSPECT THE FENCE AFTER EACH RAINFALL.
3. CHECK FOR AREAS WHERE RUN-OFF HAS ERODED A CHANNEL BENEATH THE FENCE, OR WHERE THE FENCE WAS CAUSED TO SAG OR COLLAPSE.
4. ALL NEEDED REPAIRS SHALL BE PERFORMED IMMEDIATELY.
5. REMOVE AND PROPERLY DISPOSE OF SEDIMENT WHEN IT IS ONE-THIRD TO ONE-HALF THE HEIGHT OF THE FENCE OR AFTER EACH STORM.
6. 4' MIN. STEEL OR WOOD POSTS SPACED AT 6' O.C. SOFTWOOD POSTS SHALL HAVE A 3" MIN. DIAMETER OR NOMINAL 2"x4". HARDWOOD POSTS SHALL HAVE A MINIMUM CROSS SECTION OF 1.5"x1.5"

FILTER FENCE

SCALE: 1" = 5'-0"

WARNING ! BEFORE YOU DIG
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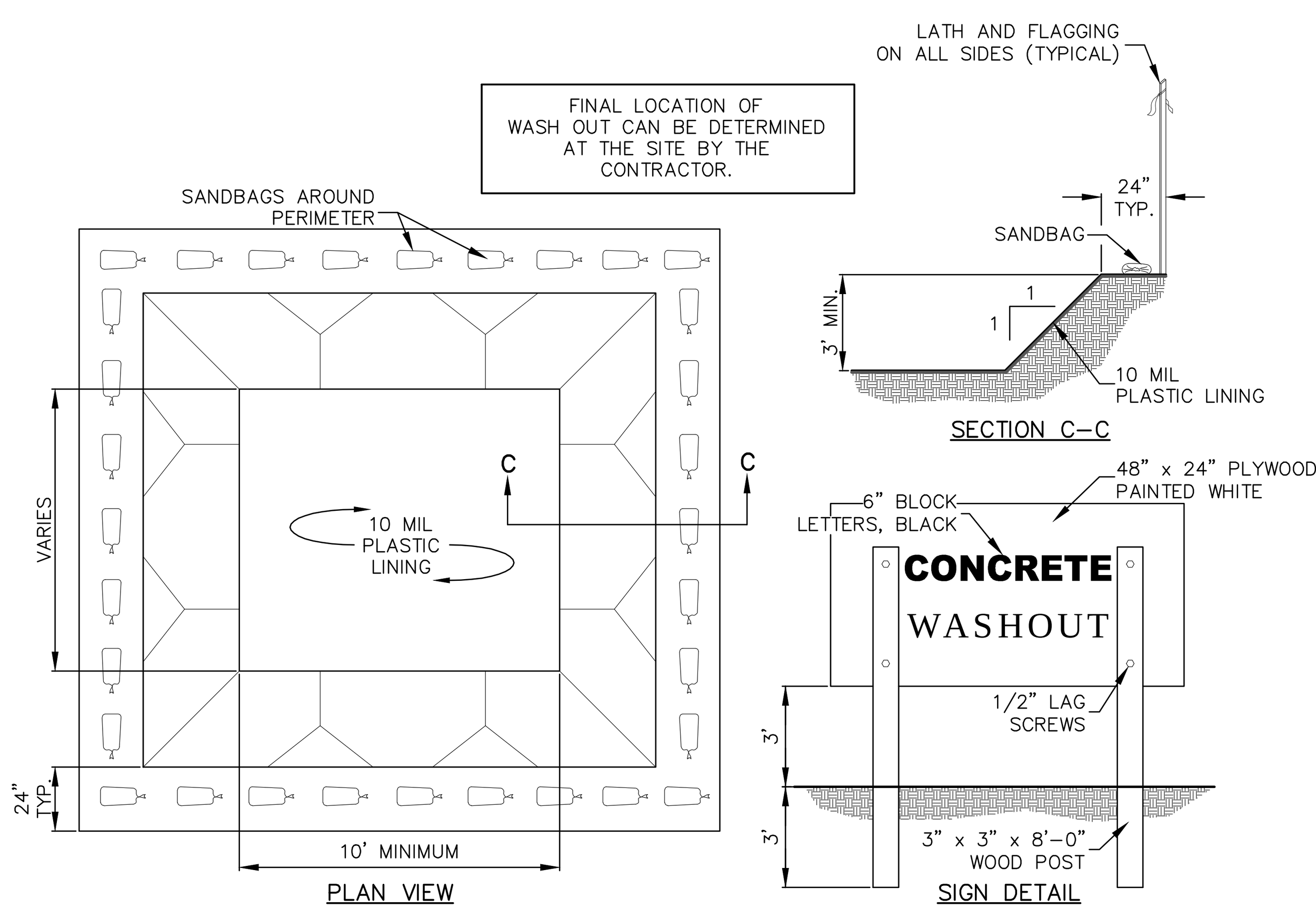
Texas811 Know what's below. Call before you dig.

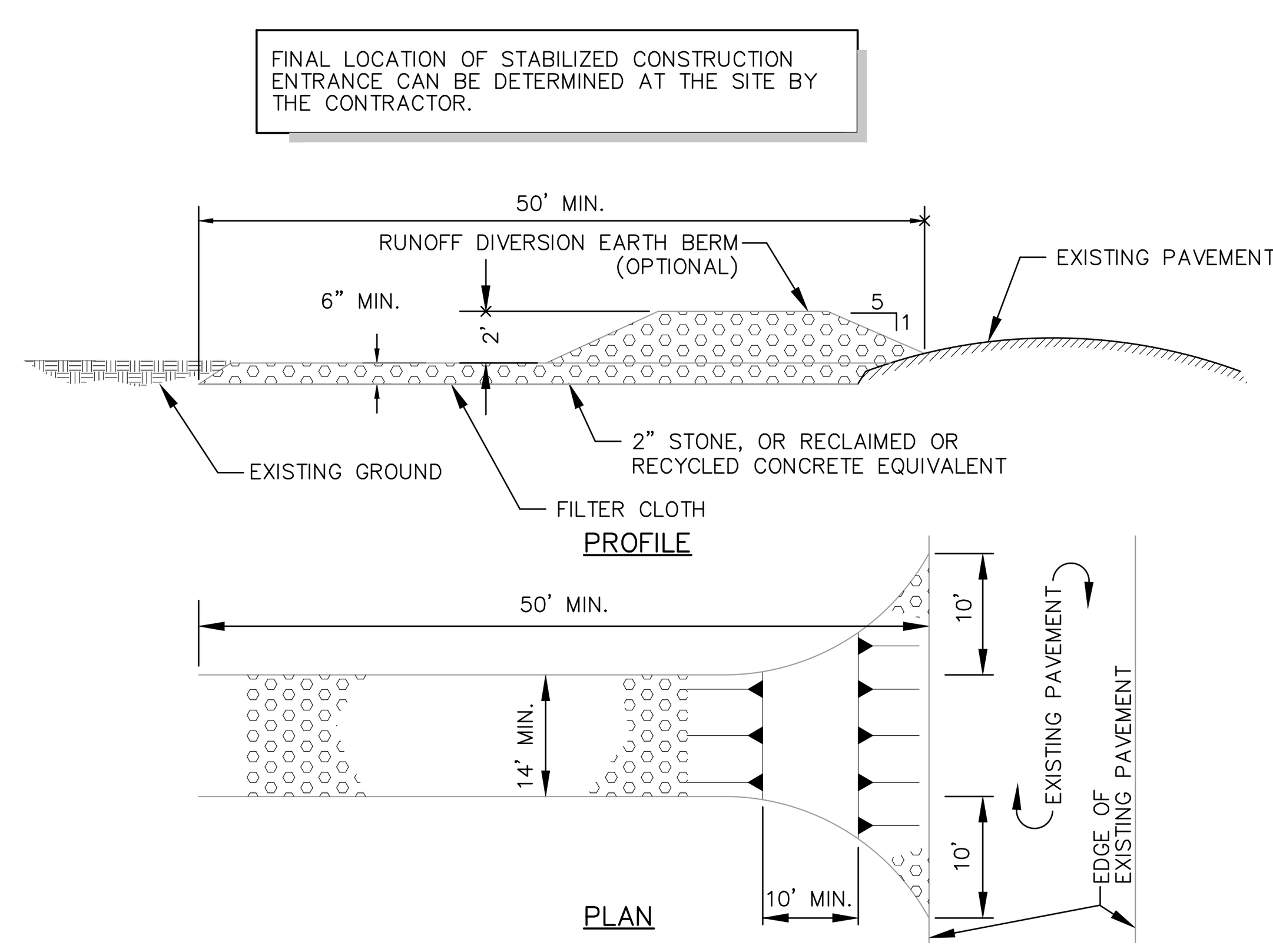


ACTUAL LAYOUT TO BE DETERMINED BY THE CONTRACTOR IN THE FIELD. WASHOUT SHALL BE INSTALLED PRIOR TO ANY CONCRETE WORK.

SIGN SHALL BE LOCATED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

CONCRETE WASHOUT

N.T.S.

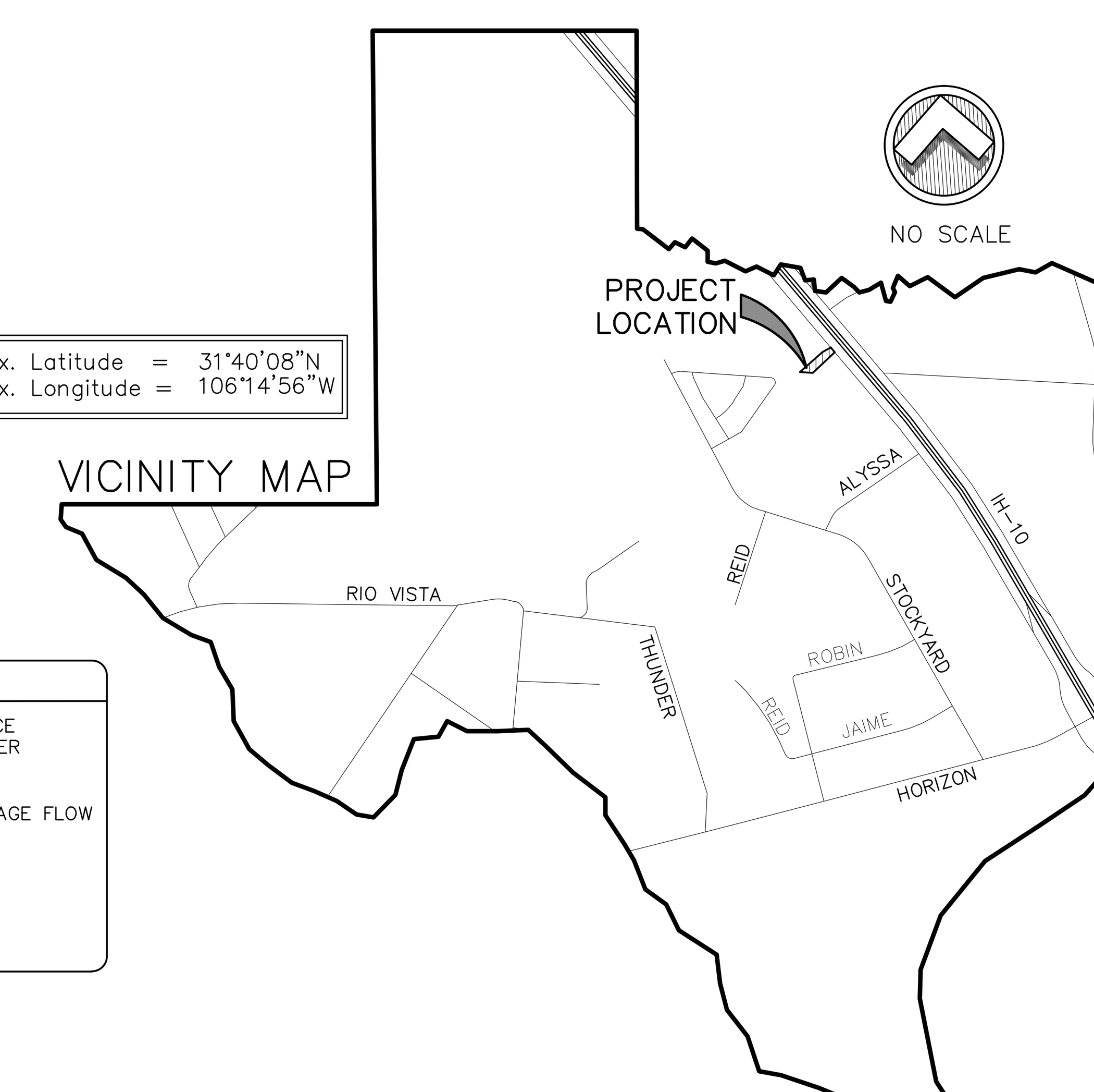


STABILIZED CONSTRUCTION ENTRANCE

N.T.S.

LEGEND	
▬ ▬ ▬	PROPOSED SILT FENCE OR HAY BALE BARRIER
←	DIRECTION OF DRAINAGE FLOW
—(25)—	PROPOSED CONTOUR
----3920----	EXISTING CONTOUR

Approx. Latitude = 31°40'08"N
Approx. Longitude = 106°14'56"W



VICINITY MAP

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fax [915] 877.4334
www.csaengineers.com

FIRM'S SEAL: STATE OF TEXAS, JOHN C. KARLSRUHER, 53878, REGISTERED PROFESSIONAL ENGINEER, 06/28/16

SCALE
Horiz. 1"=20'
Vert. N/A
Date 5/9/16
Design by DG
Drawn by DG
Chkd. by AHD/JCK
Appd. by JCK

PROJECT NAME: SPARKS ARROYO DRAINAGE IMPROVEMENTS

Planning and Zoning Department
801 N. Rio Vista Socorro, Texas 79927

SHEET TITLE: STORM WATER POLLUTION PREVENTION PLAN

SHEET NUMBER: SHT. C6.0 OF 9
SEQUENCE

BID SET

Jun 27, 2016 - 1:06pm S:\Dwg\1603 Sparks Arroyo\1603 Bid Submittal-CURRENT\1603 Sht 6.0-6.1 SW3P.dwg

LEGAL DESCRIPTION

SPARKS DRAINAGE CHANNEL, BEING ALL OF LOT 2,
BLOCK 1 SPARKS ADDITION
EL PASO, EL PASO COUNTY, TEXAS.

EROSION AND SEDIMENT CONTROL

SOIL STABILIZATION PRACTICES

- ______ TEMPORARY SEEDING
- ______ PERMANENT PLANTING, SODDING, OR SEEDING
- ______ MULCHING
- ______ SOIL RETENTION BLANKET
- ______ BUFFER ZONES
- ______ PRESERVATION OF NATURAL RESOURCES

OTHER: ______

STRUCTURAL PRACTICES: (P–PERMANENT T–TEMPORARY)

- T SILT FENCES
- T HAY BALES
- ______ ROCK BERMS
- ______ DIVERSION, INTERCEPTOR, OR PERIMETER BERMS
- ______ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- ______ DIVERSION DIKE AND SWALE COMBINATIONS
- ______ PIPE SLOPE DRAINS
- ______ CONCRETE FLUMES
- T ROCK BEDDING AT CONSTRUCTION EXIT
- ______ TIMBER MATTING AT CONSTRUCTION EXIT
- P CHANNEL LINERS
- ______ SEDIMENT TRAPS
- ______ SEDIMENT BASINS
- ______ STORM INLET SEDIMENT TRAP
- ______ STONE OUTLET STRUCTURES
- ______ CURBS AND GUTTERS
- ______ STORM DRAINS
- ______ VELOCITY CONTROL DEVICES
- P NATURAL SWALES & NATURAL DEPRESSIONS

OTHER: ______

POST CONSTRUCTION CONTROLS

A CONCRETE LINED CHANNEL WILL BE CONSTRUCTED AND RIP–RAP LINED ON THE LAND–SLIDE OF THE EMBANKMENT TO HELP CONTROL POLLUTANTS ASSOCIATED TO STORM DISCHARGE

ESTIMATED TOTAL SIZE, DISTURBED AREA

PROJECT SITE APPROX. **0.55** ACRES
ESTIMATED DISTURBED AREA **0.75** ACRES.

CONSTRUCTION START DATE: JUL 2016 CONSTRUCTION END DATE: JUL 2017

NARRATIVE – SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

1. BEGIN CONSTRUCTION/MOBOLIZATION.
2. INSTALL INITIAL STORMWATER POLLUTION PREVENTIONS (SWPP) MEASURES AS INDICATED ON SWPP PLAN.
3. CLEAR AND GRUB.
4. SITE GRADING.
5. CONSTRUCTION OF CONCRETE LINING FOR CHANNEL.
6. INSTALLATION OF PYRAMAT AND RIP–RAP BEDDING.
7. END OF CONSTRUCTION – FINAL STABALIZATION, DEMOBOLIZATION, REMOVAL OF SWPPP CONTROLS, AND CLOSURE OF SWPPP PERMIT.

GENERAL CONTRACTOR CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT I UNDERSTAND THE TERMS AND CONDITIONS OF THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM (TPDES) GENERAL PERMIT THAT AUTHORIZES STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY FROM THE CONSTRUCTION SITE IDENTIFIED AS PART OF THIS CERTIFICATION.

SIGNED: ______ COMPANY: ______
NAME: ______ ADDRESS: ______
TITLE: ______ TELEPHONE: ______
DATE: ______

SUB – CONTRACTOR CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT I WILL COORDINATE, EITHER THROUGH THE GENERAL CONTRACTOR, OWNER, OR DIRECTLY, WITH THE CONTRACTOR(S) AND/OR SUBCONTRACTOR(S) IDENTIFIED IN THE POLLUTION PREVENTION PLAN HAVING RESPONSIBILITY FOR IMPLEMENTING STORM WATER CONTROL MEASURES TO MINIMIZE ANY IMPACT MY ACTIONS MAY HAVE ON THE EFFECTIVENESS OF THESE STORM WATER CONTROLS MEASURES.

SIGNED: ______ SIGNED: ______
NAME: ______ NAME: ______
TITLE: ______ TITLE: ______
COMPANY: ______ COMPANY: ______
ADDRESS: ______ ADDRESS: ______
TELEPHONE: ______ TELEPHONE: ______
DATE: ______ DATE: ______

SOIL CONDITIONS

AS THE EXPLORATORY BORINGS INDICATE, THE SOIL UNDERLYING THE SITE CONSISTED OF INTERBEDDED SAND, SILT, GRAVEL AND COBBLE.

ENDANGERED SPECIES ACT

NOT LIKELY TO ADVERSELY AFFECT ANY CURRENTLY LISTED FEDERAL THREATENED OR ENDANGERED SPECIES.

HISTORIC PROPERTY SITE

NO KNOWN SITES ELIGIBLE FOR HISTORIC RECORD

AUTHORIZED STORM WATER DISCHARGES

1. STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY.
2. DISCHARGES OF STORM WATER ASSOCIATED WITH CONSTRUCTION SUPPORT ACTIVITIES INCLUDING CONCRETE AND ASPHALT BATCH PLANTS, EQUIPMENT STAGING AREAS, MATERIAL STORAGE YARDS, MATERIAL BORROW AREAS, AND EXCAVATED MATERIAL DISPOSAL AREAS MAY BE AUTHORIZED AS PER TPDES PERMIT NO. TXR1500000, PART II, SECTION A.

AUTHORIZED NON–STORM WATER DISCHARGES

THE FOLLOWING NON–STORM WATER DISCHARGES AREA AUTHORIZED AS PER TPDES PERMIT NO. TXR150000, PART II, SECTION A.

1. DISCHARGES FROM FIRE FIGHTING ACTIVITIES.
2. FIRE HYDRANT FLUSHING.
3. WATER USED TO CONTROL DUST.
4. WATER LINE FLUSHING.
5. VEHICLE, EXTERNAL BUILDING AND PAVEMENT WASH WATER, FREE OF DETERGENTS AND SOAPS.
6. AIR CONDITIONING CONDENSATE.

BEST MANAGEMENT PRACTICES

1. STRUCTURAL MEASURES SHALL BE MAINTAINED THROUGHOUT THE LIFE OF THE PROJECT IN EFFECTIVE OPERATING CONDITION.
2. DOCUMENTATION OF MAINTANENCE ACTIVITIES INCLUDING FREQUENCY, LOT DESIGNATION, INSPECTION OF STRUCTURAL CONTROLS, MAT'L STORAGE AREAS VEHICLES ENTRANCE AND EXISTS: ACTIONS TAKEN AND INSPECTORS NAME.
3. CONSTRUCTION SITE NOTICE WILL BE MAINTAINED ON SITE.
4. COPY OF SWPPP SHALL BE KEPT ON SITE.
5. PERIMETER MUST RETAIN THE SWPS NOI AND INSPECTION LOG FOR A MINIMUM OF 3 YEARS FROM THE TERMINATION AND FINAL STABILIZATION OF PROJECT.

I WASTE MATERIALS:

ALL WASTE MATERIALS, INCLUDING CONSTRUCTION DEBRIS, SHALL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER. NO CONSTRUCTION WASTE MATERIAL SHALL BE BURIED ON SITE. THE TRANSIT DUMPSTER SHALL COMPLY WITH ORDINANCE 18.52.010 (ENCLOSURE & REMOVAL OF WASTE MATERIALS DURING CONSTRUCTION). THE DUMPSTER SHALL BE EMPTIED AS NECESSARY OR AS REQUIRED BY ORDINANCE 9.04 (SOLID WASTE MANAGEMENT) AND THE TRASH SHALL BE HAULED TO A LICENSED LANDFILL.

II HAZARDOUS WASTE:

AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES SHALL BE CONSIDERED HAZARDOUS: PAINT, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SPILL STABILIZATION, CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE CONTRACTOR SHALL TAKE IMMEDIATE ACTION AND CONTACT THE FIRE DEPT. AND TNRCC.

III SANITARY WASTE:

ALL SANITARY WASTE SHALL BE COLLECTED FROM THE CONSTRUCTION PORTABLE UNITS AS NECESSARY OR AS REQUIRED, CHAPTER 18.08 (BUILDING CODE), BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR. ALL WASTE MATERIAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

IV SPILL PREVENTION:

THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURES OF MATERIALS TO STORM WATER RUNOFF.

V GOOD HOUSEKEEPING:

A. STORE ONLY ENOUGH PRODUCTS REQUIRED TO DO THE JOB
B. NEATLY STORE MATERIALS ON–SITE IN AN ORDERLY MANNER
C. KEEP PRODUCTS IN THEIR ORIGINAL CONTAINER
D. DO NOT MIX SUBSTANCES WITH ONE ANOTHER, UNLESS OTHERWISE RECOMMENDED BY THE MANUFACTURER
E. USE ENTIRE CONTENTS OF A PRODUCT BEFORE DISPOSING THE CONTAINER
F. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL

VI HAZARDOUS PRODUCTS:

PRACTICES USED TO REDUCE RISKS:

A. KEEP PRODUCTS IN THEIR ORIGINAL CONTAINER IF AT ALL POSSIBLE
B. RETAIN ORIGINAL LABELS, PRODUCT INFORMATION AND MATERIAL SAFETY DATA SHEETS (MSDS)
C. DISPOSE SURPLUS PRODUCT IN ACCORDANCE WITH MANUFACTURER'S OR LOCAL & STATE RECOMMENDED METHODS

POSSIBLE POLLUTANTS ON–SITE

A. GAS TANK CONTAINERS
   1. INSPECT CONTAINERS FOR LEAKS AND ENSURE LIDS AND CAPS ARE PROPERLY SEALED. DAMAGED TANKS OR CONTAINERS SHALL BE PROPERLY REMOVED/REPLACED AND DISPOSED OF.
B. LUBRICATING GREASE CONTAINERS
   1. ALL ON–SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTATIVE MAINTENANCE TO REDUCE CHANCE OF LEAKAGE; DRIP PANS SHALL BE UTILIZED FOR LEAKING VEHICLES AND FOR FLUID DRAINING.
C. CEMENT DISCHARGE INTO EXISTING STORM SYSTEM
   1. ONSITE INSPECTIONS OF CONCRETE POUR AREAS SHALL BE DONE TO ENSURE THAT CEMENT DOES NOT RUNOFF AND DISCHARGE INTO EXISTING STORM SEWER SYSTEM.

VII PETROLEUM PRODUCTS:

ALL ON–SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT SUBSTANCES USED ON–SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION.

VIII SPILL CONTROL PRACTICES:

A. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES:
B. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON–SITE:
C. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY
D. SPILL AREA SHALL BE WELL VENTILATED AND APPROPRIATE CLOTHING WILL BE WORN:
E. ANY SPILL SHALL BE REPORTED TO THE APPROPRIATE GOVERNMENTAL AGENCY
F. MEASURES SHALL BE TAKEN TO PREVENT A SPILL FROM REOCCURRING

BEST MANAGEMENT PRACTICES CONTROLS

IX MAINTENANCE AND INSPECTION PROCEDURES:

ALL POLLUTION PREVENTION MEASURES SHALL BE INSPECTED AT LEAST ONCE EVERY 7 DAYS OR WITHIN 24–HOURS PRIOR TO ANTICIPATED STORM EVENT AND FOLLOWING A STORM EVENT OF 0.5 INCHES OR MORE. INSPECTION IN FINAL STABILIZED AREAS OR DURING ARID PERIODS WILL BE CONDUCTED BI–WEEKLY. BEST MANAGEMENT PRACTICES AND POLLUTION CONTROL PROCEDURES SHALL BE INSPECTED FOR ADEQUACY. A REPORT SUMMARIZING THE SCOPE OF INSPECTION SHALL BE DONE & RETAINED ALONG WITH THE SDPCP.

X REMARKS:

DISPOSAL AREAS, STOCKPILES, AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, WATERBODY OR STREAMBED. CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS. ALL WATERWAYS SHALL BE CLEANED AS SOON AS PRACTICABLE OF TEMPORARY EMBANKMENT, TEMPORARY BRIDGES, MATTING, FALSEWORK, PILING DEBRIS OR OTHER OBSTRUCTIONS PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT A PART OF THE FINISHED WORK.

XI OFFSITE VEHICLE TRACKING:

IN ADDITION TO THE STABILIZED CONSTRUCTION ENTRANCES, THE FOLLOWING MEASURES SHALL BE OBSERVED DURING CONSTRUCTION:

- X –HAUL ROADS SHALL BE DAMPENED FOR DUST CONTROL
- X –LOADED HAUL TRUCKS SHALL BE COVERED WITH TARPAULIN
- X –EXCESS DIRT ON ROAD SHALL BE REMOVED IMMEDIATELY
- X –STABILIZED CONSTRUCTION ENTRANCE
- X –OTHER: ______

MATERIALS WITH CONSTRUCTION SITE:

- ______ HAS BATCH PLANT WITH PROJECT
- ______ HAS ASPHALT PLANT WITH PROJECT
- X DOES NOT HAVE BATCH PLANT WITH PROJECT
- X DOES NOT HAVE ASPHALT PLANT WITH PROJECT

OWNER CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

______
OWNER : SIGNED DATE

______
OWNER : NAME DATE

______
TITLE DATE

GENERAL NOTES

1. CONTRACTOR TO PROVIDE A CONSTRUCTION SIGN ONSITE, CONSPICUOUSLY NEAR MAIN ENTRANCE, WITH A COPY OF N.O.I. POSTED.
2. CONTRACTOR TO DESIGNATE A QUALIFIED COMPETENT PERSON TO INSPECT AND RECORD SW3P AND BMP INSPECTION IN ACCORDANCE TO SITE INSPECTION REPORT.
3. CONTRACTOR TO KEEP ORIGINAL N.O.I. AND INSPECTION REPORTS ON SITE AT ALL TIMES.
4. CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN A CLEAN WORK SITE.
5. CONTRACTOR MUST KEEP RECORD OF IMPORTANCE DATES SUCH AS, BUT NOT LIMITED TO, MAJOR GRADING ACTIVITIES, CONSTRUCTION TEMPORARILY OR PERMANENTLY WORK CEASED, STABILIZATION MEASURES INITIATED.

NOTE:
CONTRACTOR SHALL ENSURE COMPLIANCE WITH SW3P AND TPDES PERMIT TXR 15000. PERMIT TXR 15000 IS LOCATED AND CAN BE VIEWED WITH THE CIVIL ENGINEER – CSA DESIGN GROUP, INC., 1845 NORTHWESTERN DR, SUITE C, EL PASO, TX. 79912.

WARNING ! BEFORE YOU DIG
CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND IMPROVEMENTS IN PROJECT AREA

Texas 811
Know what's below. Call before you dig.

Jun 27, 2016 – 1:07pm
S:\Draw\1603 Sparks Arroyo\1603 Bid Submittal–CURRENT\1603 Sht 6.0–6.1 SW3P.dwg
aontiveros

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FIRM'S SEAL
STATE OF TEXAS
JOHN C. KARLSRUHER
53878
REGISTERED PROFESSIONAL ENGINEER
6/28/16

SCALE
Horiz. N/A
Vert. N/A
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Chkd. by AHO/JCK
Appd. by JCK

PROJECT NAME
SPARKS ARROYO DRAINAGE IMPROVEMENTS

Planning and Zoning Department
860 N. Rio Vista Socorro, Texas 79927 Tel. (915)872-8531 Fax (915) 872-8673

CITY OF SOCORRO, TEXAS 1691 MISSION A CITY WITH A

SHEET TITLE
STORM WATER POLLUTION PREVENTION PLAN NOTES

SHEET NUMBER
SHT. C6.1 OF 9
SEQUENCE

BID SET