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818 S. FLORES ST. ⓪ SAN ANTONIO, TEXAS 78204 ⓪ www.saha.org

Procurement Department

REQUEST FOR PROPOSALS

For

Pecan Hill Tree Removal and Sanitary Sewer Retrofit

For

HOUSING AUTHORITY OF THE CITY OF SAN ANTONIO, TEXAS AND AFFILIATED ENTITIES

RFP#: 1911-913-45-4982

Prepared by:

Department of Procurement
of
The San Antonio Housing Authority
818 South Flores Street
San Antonio, Texas 78204

President and CEO …….... David Nisivoccia

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Section A
Background Information and Evaluation

I. Background Information: The San Antonio Housing Authority d/b/a San Antonio Housing Authority ("SAHA") is a public housing agency created by resolution of the City of San Antonio in 1938 pursuant to the Texas Housing Authorities Law (now Chapter 392 of the Texas Local Government Code) and federal law. SAHA is a unit of government and its functions are essential governmental functions. The property of SAHA is used for essential public and governmental purposes and is exempt from all taxes, including sales tax on all its purchases of supplies and services.

SAHA enters into and executes contracts and other instruments that are necessary and convenient to the exercise of its powers. SAHA maintains contractual arrangements with United States Department of Housing and Urban Development (HUD) to manage and operate its low rent public housing program and administers the Section 8 Housing Assistance Payments Programs. SAHA programs are federally funded along with development and modernization grants and rental income.

Its primary activity is the ownership and management of over 6,300 public housing units. It also administers rental assistance for almost 12,000 privately owned rental units through the Section 8 program. It operates and manages its housing developments to provide decent, safe, sanitary and affordable housing to low income families, the elderly, and the disabled, and implements various programs designed and funded by HUD.

SAHA has created a number of affiliated public facility corporations ("PFCs") pursuant to Chapter 303 of the Texas Local Government Code (the Public Facility Corporation Act). In some instances, these PFCs own projects. In other cases, PFCs or other related entities serve as partners in partnerships that have been awarded low-income housing tax credits. SAHA's affiliated entities own and operate over 3,000 units of affordable housing.

SAHA staff also manages the San Antonio Housing Finance Corporation ("Finance Corporation"), which is primarily a conduit issuer of bonds for contractors of affordable housing projects. The Finance Corporation was created pursuant to Chapter 394 of the Texas Local Government Code (the Texas Housing Finance Corporations Act). When used herein, "SAHA" shall include its affiliated entities.

As a part of our social mission and federal mandate, SAHA is committed to providing economic, training and educational opportunities to the low income individuals in the communities we serve. All contractors are required to recruit and hire low income individuals for new positions and provide training & educational opportunities to the greatest extent feasible for these individuals.

SAHA is governed by a Board of Commissioners and managed on a day-to-day basis by its President and CEO. The SAHA Board of Commissioners, upon the advice of the President and CEO, approves all major policy and contractual decisions. The President and CEO is then charged with implementing these actions.

II. Property Improvement Opportunities:

At this time, The Housing Authority of the City of San Antonio and its affiliated entities (SAHA) invite proposals from qualified, experienced utility and site work construction companies to provide for tree removal and sanitary sewer retrofit and improvements at the Pecan Hill Apartments located at 1600 W. Lawndale, San Antonio, TX 78209 as further described in Exhibit A. The property is geographically located in the North Central quadrant of the City of San Antonio.

SAHA will consider proposals from responsible organizations or individuals currently engaged in the performance of property construction, rehabilitation and site improvement services who have competency in performing comparable on-site property improvements for similar properties, acceptable financial resources and personnel staffing to perform the services requested. The complex is currently approximately 95% occupied.

III. Timeline:

DATE ISSUED	December 13, 2019
NON-MANDATORY PRE-SUBMITTAL MEETING	December 19, 2019 at 10:00 A.M.
MANDATORY SITE VISIT	December 19, 2019 1:00 pm to 4:00 pm
LAST DATE FOR QUESTIONS	January 6, 2020
PROPOSAL DUE DATE	January 15, 2020 at 2:00 P.M. SAHA Procurement Dept. 818 S. Flores, San Antonio, TX 78204
ANTICIPATED APPROVAL BY THE BOARD	February/March 2020

SAHA reserves the right to modify this schedule at their discretion. Notification of changes in connection with this solicitation will be made available to all interested parties via an emailed Addendum and by posting on SAHA's website and other websites.

IV. Objectives:

The services to be provided include all aspects of tree removal, demolition, rehabilitation, site drainage and sewer improvements at the Pecan Hill Apartments including retaining wall repairs/modifications, fencing and other work consistent with the attached plans and specifications, and applicable regulatory compliance standards, codes, rules statutes, and reporting.

The goals of the tree removal and sewer improvements to this property are to enhance and improve the asset and to extend its useable life as a safe and desirable residential facility. Achievement of this goal will include, but not be limited to the:

- Improvement of resident safety;

- Reduction of maintenance costs; and
- Improvement of aesthetics and livability;

V. Desired Outcome:

A. The successful Contractor will assume full responsibility for the property improvements at a date and time reflected in a Notice to Proceed issued by the SAHA Construction Services Department. SAHA expects an approximate **240** days construction period.

VI. Evaluation: Each proposal submittal will be evaluated based upon the following information and criteria:

A. Initial Evaluation-Responsiveness: Each proposal received will first be evaluated for responsiveness (i.e., meeting the minimum requirements as stated in the RFP)

B. Evaluation-Responsibility: SAHA shall select a minimum of a three-person panel, using the criteria established below, to evaluate each of the proposals submitted in response to this RFP to determine the Respondent's level of responsibility. SAHA will consider capabilities or advantages that are clearly described in the proposal that may be confirmed by oral presentations, site visits, demonstrations, and references contacted by SAHA. All proposals will be evaluated as to their overall value to SAHA.

C. Restrictions: All persons having familial (including in-laws) and/or employment relationships (past or current) with principals and/or employees of a Respondent will be excluded from participation on SAHA's evaluation panel. Similarly, all persons having ownership interest in and/or contract with a Respondents will be excluded from participation on SAHA's evaluation panel.

D. Evaluation Criteria: The evaluation panel will use the following criteria to evaluate each proposal:

5 Excellent
4 Above Average
3 Average
2 Below Average
1 Poor
0 Non Responsive

Continues on next page.

No.	Points	Weight	CRITERION DESCRIPTION
1	0-5	25%	**Experience in affordable, mixed-income and multi-story construction, rehabilitation and site improvements:** Depth and breadth of Respondent's experience and qualifications beyond the Minimum Qualifications; familiarity with tree removal, sewer and utility work and site improvements at existing low-rise multi-story multifamily buildings. Proven record of accomplishment in working on similar projects with other private and governmental entities, including housing authorities, Non Profits, and multifamily industry.
2	0-5	20%	**Project Management:** Respondent's proposed project approach and draft plan for this project including any use of technology in the plan to control risks and schedule slippage.
3	0-5	10%	**Capacity/Financial Viability:** Respondent's financial and staffing capacity to support a project of this size and scope. Current number of active projects which may affect project manpower and schedules.
4	0-5	10%	**Construction Plan**: Clarity and sufficiency of proposed Plan; Capacity to execute to proposed plan and complete construction in a timely and on budget manner. Proposed plan schedule and timeline for completion. Number and type of sub-contractors utilized vs. self-performed work.
5	0-5	5%	**Strength of the Contractor's S/W/MBE Utilization Plan**
7	0-5	30%	**Price proposal:** Competitive fee structure offered that's within SAHA's expected costs and available funding. Must provide a supporting schedule of values/build of materials.
		100%	**Total Points for Criteria**

E. Competitive Range: Once a competitive range is established from the proposals submitted, SAHA reserves the right to require Respondents within the competitive range to make a presentation to the evaluation committee. Presentations, if requested, shall be a factor in the award recommendation.

VII. Minimum Qualifications: Respondents must meet the following criteria:

A. Type of Organization: Firms or joint ventures of firms with a demonstrated record of expertise in one or more of the following:

- Construction and completion of two or more projects within the past 5 years of a similar nature, size and scope as contemplated herein.
- Completion of two or more projects in the past 5 years reflecting Respondent's experience in utility, sewer and site improvements of affordable multifamily housing properties.
- Continuous operation for three (3) or more years as a construction firm or 10 or more years' experience of principals collectively in the construction, rehabilitation and modernization of multi-family residential housing.
- Valid Contractor's license to do business in the State of Texas.
- Project Manager shall have a minimum of 10 years of project management experience in the rehabilitation and site improvements of low-rise, multi-story, multi-family construction rehabilitation and improvement projects.
- Proven ability to adhere to project budgets and schedules.
- No material litigation matters within the past five (5) years.

End Section A

Section B
Instructions to Respondents

I. **Point of Contact**: The point of contact for purposes of obtaining the Request for Proposal and to submit responses is:

POINT OF CONTACT	Charles Bode, Assistant Director of Procurement San Antonio Housing Authority 818 S. Flores San Antonio, TX 78204 Phone: (210) 477-6703 E-mail: charles_bode@saha.org

The Request for Proposals can be obtained by calling 210-477-6059 or online at

www.saha.org

http://nahro.economicengine.com

http://www.publicpurchase.com

All Addenda will be posted on SAHA's website www.saha.org, http://nahro.economicengine.com and www.publicpurchase.com. Any changes that are issued before the proposal submission deadline shall be binding upon all prospective Respondents.

Respondents shall address all communication and correspondences pertaining to this RFP process to only the Contact person identified above. Respondents must not inquire or communicate with any other SAHA staff member or official (including members of the Board of Commissioners) pertaining to this RFP. Failure to comply with this requirement is cause for a proposal to be disqualified. During the RFP solicitation process, SAHA will not conduct any ex parte conversations which may give one prospective Respondent an advantage over other prospective Respondents.

II. **Prohibitions:** Contact with members of the SAHA Board of Commissioners, or SAHA officers and employees other than the contact person listed herein**,** by any prospective Respondent, after publication of the RFP and prior to the execution of a contract with the successful Respondent(s) could result in disqualification of your proposal. In fairness to all prospective Respondent(s) during the RFP process, if SAHA meets in person with anyone representing a potential provider of these services to discuss this RFP other than at the pre-submittal meeting, an addendum will be issued to address all questions so as to insure no Respondent has a competitive advantage over another. This does not exclude meetings required to conduct business not related to the RFP, or possible personal presentations after written proposals have been received and evaluated.

III. Non-Mandatory Pre-Proposal Conference: A pre-proposal conference will be held at the SAHA Central Office, located at 818 S. Flores, San Antonio, Texas 78204 as indicated herein. The purpose of this conference is to assist Respondents in understanding the RFP documents and required submittal documents. At this conference, SAHA will conduct an overview of the RFP documents, including attachments. Any questions must be submitted in writing (e-mail is acceptable) to the contact person listed herein and will be answered in an addendum.

IV. Mandatory Site Visit: Prospective Proposers must visit the site during the date and time established for the site visit and sign in on the provided registration sheets. Proposals from firms not registered on the site sign in sheets will be rejected and not considered as responsive.

V. SAHA'S Reservation of Rights:

SAHA reserves the right, without liability, to:

- reject any or all proposals, to waive any informality in the RFP process, or to terminate the RFP process at any time, if deemed by SAHA to be in its best interests.
- award a contract pursuant to this RFP to one or more Respondents.
- terminate a contract awarded pursuant to this RFP, at any time for its convenience upon 30 days written notice to the successful Respondent.
- determine the days, hours and locations in which the services are performed in this RFP.
- retain all proposals submitted and not permit withdrawal for a period of 90 days subsequent to the deadline for receiving proposals without the written consent from SAHA.
- negotiate the fees proposed by all Respondents. If such negotiations are not, in the opinion of SAHA successfully concluded within a reasonable timeframe as determined by SAHA, SAHA shall retain the right to end such negotiations.
- reject and not consider any proposal that does not meet the requirements of this RFP, including but not necessarily limited to rejection of incomplete proposals and/or proposals offering alternate or non-requested services and from Respondents deemed non- responsive and non-responsible.
- prohibit any further participation by a Respondent or reject any proposal submitted that does not conform to any of the requirements detailed herein. Each prospective Respondent further agrees that he/she will inform SAHA in writing within five (5) days of the discovery of any item that is issued thereafter by SAHA that he/she feels needs to be addressed. Failure to abide by this timeframe shall relieve SAHA, but not the prospective Respondents, of any responsibility pertaining to such issue.
- award, to revise, change, alter or amend any of the instructions, terms, conditions, and/or specifications identified within the RFP documents issued, within any attachment or drawing, or within any addenda issued.
- to advertise for new proposals or to proceed to do the work otherwise if proposals are rejected.
- cancel the award of any proposal(s) at any time before the execution of the contract documents by all parties.

- reduce or increase estimated or actual quantities in whatever amount necessary if funding is not available, legal restrictions are placed upon the expenditure of monies for this category of service or supplies, or SAHA's requirements in good faith change after award of the contract.
- make an award to more than one Respondents based on ratings or to make an award with or without negotiations or Best and Final Offers (BAFO)
- establish a competitive range for responses based on the initial scores and to require presentations by the Respondents within the competitive range.
- require additional information from all Respondents to determine level of responsibility. Such information shall be submitted in the form and time frame required by SAHA.
- amend the terms of the contract any time prior to contract execution.
- contact any individuals, entities, or organizations that have had a business relationship with the Respondents regardless of their inclusion in the reference section of the proposal submittal.

VI. Timely Submissions: Late submissions will not be accepted. Proposals received prior to the submittal deadline shall be securely kept, unopened, by SAHA. No proposal received after the designated deadline shall be considered. Respondents are cautioned that any proposal submittal that is time-stamped as being received by SAHA after the exact time set as the deadline for the receiving of proposals shall not be considered. Any such proposal inadvertently opened shall be ruled to be invalid. No responsibility will attach to SAHA or any official or employee thereof, for the pre-opening of, or the failure to open a proposal not properly addressed and identified.

VII. Pre-Qualification: Respondents will not be required to pre-qualify to submit a proposal. However, all Respondents will be required to submit adequate information showing that the Respondents is qualified to perform the required work

VIII. Review of RFP Forms, Documents, Specifications and Drawings: It shall be each Respondent's responsibility to examine carefully and, as may be required, properly complete all documents issued pursuant to this RFP. Unless otherwise instructed, specifications and drawings (if provided) do not purport to show all of the exact details of the work. They are intended to illustrate the character and extent of the performance desired under the proposed contract and may be supplemented or revised from time to time.

IX. Responses: A total of one (1) original signed copy (marked "ORIGINAL") using the Proposal Form attached as Attachment F, and three (3) exact copies, (marked copy) shall be placed unfolded in a sealed package with the Respondent's name and return address and addressed as follows:

{RFP # {Insert Number}
{Insert Exact Title of RFP}
{Insert Month, day, year, Time of Bid Opening}
The San Antonio Housing Authority
Procurement Department
818 S. Flores
San Antonio, Texas 78204

The Respondents shall bind the proposal such that SAHA can, if needed, remove the binding (i.e. "comb-type, etc.) or remove the pages from the cover (i.e. 3-ring binder, etc.) to make copies then return the proposal submittal to its original condition.

X. Withdrawal of Proposals: A request for withdrawal of a proposal due to a purported error must be filed in writing by the Respondents within 48 hours after the proposal deadline. The request shall contain a full explanation of the purported error. The foregoing shall not be construed to violate the common law right of withdrawal for material error as defined in State statute. SAHA retains the right to accept or reject any and all bids to the extent permitted by law. Negligence on the part of the Respondents in preparing his/her proposal confers no right of withdrawal or modification of the proposal after such proposal has been received and opened.

XI. Mistake in Proposal Submitted: After a proposal has been opened it may not be changed for the purpose of correcting an error in the pricing. This does not affect the common law right of the Respondent to withdraw a bid due to a material mistake in the bid.

A. Irregular Proposal Submittal: A proposal shall be considered irregular for any one of the following reasons, any one or more of which may, at SAHA's discretion, be reason for rejection:

- If the forms furnished by SAHA are not used or are altered or if the proposed costs are not submitted as required and where provided.
- If all requested completed attachments do not accompany the proposal submittal.
- If there are unauthorized additions, conditional or alternate proposals, or irregularities of any kind which may tend to make the proposal incomplete, indefinite or ambiguous as to its meaning or give the Respondents submitting the same a competitive advantage over other Respondents.
- If the Respondent adds any provisions reserving the right to accept or reject any award or to enter into a contract pursuant to an award.

XII. Disqualification of Respondents: Any one or more of the following shall be considered as sufficient for the disqualification of a prospective Respondents and the rejection of his/her proposal:

- Evidence of collusion among prospective Respondents. Participants in such collusion will receive no recognition as Respondents or Respondents for any future work with SAHA until such participant shall have been reinstated as a qualified bidder or Respondent. The names of all participants in such collusion shall be reported to HUD and any other inquiring governmental agency.
- More than one proposal for the same work from an individual, firm, or corporation under the same or different name(s).
- Lack of competency, lack of experience and/or lack of adequate resources.

- Unsatisfactory performance record as shown by past work for SAHA or with any other local, state or federal agency, judged from the standpoint of workmanship and progress.
- Incomplete work, which in the judgment of SAHA, might hinder or prevent prompt completion of additional work, if awarded.
- Failure to pay or satisfactorily settle all bills due on former contracts still outstanding at the time of award.
- Failure to demonstrate minimum qualification requirements of SAHA.
- Failure to list, if required, all team members, subcontractors (if subcontractors are allowed by SAHA) who will be engaged by the successful Respondent(s) to participate in the Project.
- Failure of the successful Respondents to be properly licensed by the City, County and/or the State of Texas and/or to be insured by a commercial general liability policy and/or worker's compensation policy and/or business automobile liability policy, if applicable.
- Any reason to be determined in good faith, to be in the best interests of SAHA.

XIII. Questions/Inquiries: A Respondent may inquire or question any of the proposal documents or any part of the information contained therein, by submitting, in writing to the contact person listed herein, at least eight (8) days prior to the proposal submission deadline, a complete and specific explanation as to what he/she is requiring clarification. SAHA reserves the right to issue a revision to the applicable RFP requirements in the form of an Addendum or may reject the Respondent's request.

XIV. Substitutions: Respondents must propose a Project that meets the requirements of the RFP documents. All verbal communications or instructions provided by any SAHA personnel shall only become official and binding when issued as an addendum by the SAHA Procurement Department.

XV. No Liability for Costs: SAHA assumes no liability or responsibility for the costs incurred by the Respondents for any materials, efforts or expenses required in the preparation of proposals or in connection with presentations or demonstrations prior to the issuance of a Contract.

XVI. Proposal Opening Results: Proposals are publicly opened and the results are generally a matter of public record. When SAHA has concluded all evaluations, has chosen a final top-rated Respondent/s, has completed the award and is ready to issue such results, SAHA shall notify the successful Respondent/s. All proposal documents submitted by the Respondents are generally a matter of public record unless such information is deemed to be proprietary.

XVII. Award: Submissions will be evaluated on the criteria stated in Section A of this RFP. After evaluation of the responses, the Contract will be awarded to one or more the Respondent/s representing the "Best Value" to SAHA. The Selected Contractor will then enter into a construction agreement with SAHA.

XVIII. Taxes. SAHA, as a governmental entity, is exempt from Texas State Sales and Use Taxes and Federal Excise Taxes. A letter of Tax Exemption will be provided upon request.

XIX. Insurance: If a Respondent receives an award and unless otherwise waived in the Contract, the Selected Developer will be required to provide an original Certificate of Insurance confirming the minimum requirements found within Exhibit I to SAHA within 10 days of contract signature.

XX. Exceptions. SAHA will consider any exception to the RFP that the Respondent wishes to include but the failure of SAHA to include such exceptions does not give the successful Respondent the right to refuse to execute SAHA's contract form. It is the responsibility of each prospective Respondent to notify SAHA, in writing, in its Proposal of any exceptions to the RFP terms. SAHA will consider such clauses and determine whether or not to include in the Contract.

XXI. RIGHT TO PROTEST:

A. Rights: Any prospective or actual Respondents or contractor, who is allegedly aggrieved in connection with the solicitation of a proposal or award of a contract, shall have the right to protest. Such right only applies to deviations from laws, rules, regulations, or procedures. Disagreements with the evaluators' judgments as to the number of points scored are not reasons for an appeal. An alleged aggrieved protestant claiming this right is hereby informed that these regulations do not provide for administrative appeal as a matter of right for that alleged aggrieved protestant.

A.1 Definition: An alleged aggrieved "protestant" is a prospective Respondent or Respondents who feels that he/she has been treated inequitably by SAHA and wishes SAHA to correct the alleged inequitable condition or situation.

A.2 Eligibility: To be eligible to file a protest with SAHA pertaining to an RFP or contract, the alleged aggrieved protestant must have been involved in the RFP process in some manner as a prospective Respondents (i.e. recipient of the RFP documents) when the alleged situation occurred. SAHA has no obligation to consider a protest filed by any party that does not meet these criteria.

A.3 Procedure: Any actual or prospective contractor may protest the solicitation or award of a contract for material violation of SAHA's procurement policy. Any protest against a SAHA solicitation must be received before the due date for receipt of Proposals or proposals and any protest against the award of a contract must be received within ten calendar days after contract award or the protest will not be considered.

All protests must be in writing and submitted to the Director of Procurement for a written decision. The Director of Procurement shall make a recommendation to the Contracting Officer who shall issue a written decision and findings to the Contractor within 30 days from receipt of the written protest. This decision is then appealable to the Board of Commissioners within 30 days of receipt of the written decision. Appeals which are not timely filed will not be considered and the decision becomes final. All appeals shall be marked and sent to the address as listed in the following example:

APPEAL OF RFP NO. (insert exact number of RFP here)
San Antonio Housing Authority
Attn: Procurement Department
818 South Flores Street
San Antonio, TX 78204

XXI. Bonding

A. SAHA requires a Bid Bond for this bid in the amount of 5% of the Base Bid. Bid Bond shall be placed behind the Proposal Fee Sheet. Bid Bond must be submitted with proposal. Proposals without Bid Bond shall be rejected. Non-surety bonds must be in certified funds (ex. Cashier's check) made payable to SAHA, personal or company checks are not acceptable.

B. Performance Bond: The Contractor must provide SAHA a 100% Performance Bond for total contract value, however if the Contractor is unable to acquire the equitable bonding that is acceptable to SAHA within ten (10) days of signed contract, then the Contractor will be deemed in breach of contract.

C. Payment Bond: The Contractor must provide SAHA a 100% Payment Bond for each Project Contract executed by SAHA, however if the Contractor is unable to acquire the equitable bonding that is acceptable to SAHA within ten (10) days of signed contract, then the Contractor will be deemed in breach of contract.

XXII. Escalation: No escalations shall be considered, this will be a fixed fee contract.

End Section B

Section C
Information To Be Submitted

The response to this RFP shall be submitted in the manner described in this Section. Each category must be separated by index dividers and the index divider must extend so that each tab can be located without opening the proposal and labeled with the corresponding tab reference noted below. Failure to submit the proposal in the manner specified may result in a premature opening of, post-opening of, or failure to open and consider that proposal and may be cause for elimination of that Respondent from consideration for award.

C.1 Tab 1, References: The Respondent shall submit 3 former or current clients/projects within the past 10 years, preferably other than SAHA, for whom the Respondent has performed construction services similar to those being proposed herein. The list shall, at a minimum, include for each reference:

- **C.1.1** The client's name and name of the contact
- **C.1.2** The client's current telephone number and address
- **C.1.3** Description of services provided to the client
- **C.1.4** Project and construction type
- **C.1.5** Date of services

This information shall be submitted under the Tab 1 of the Proposal.

C.2 Tab 2, HUD Forms, Conflict of Interest Questionnaire and Form 1295: These Forms are attached hereto as Attachment B to this RFP document must be fully completed, except as noted, executed where provided thereon, and submitted under this tab as a part of the proposal submittal. ***NOTE*** Only the successful Respondent shall be required to submit a Form 1295 to the Texas Ethics Commission in compliance with Government Code 2252.908 and a copy of the submission along with the Certification prior to execution of the contract with SAHA.

This information shall be submitted in the form of Tab 2 to the Proposal.

C.3 Tab 3, Profile of Firm Form: The Profile of Firm Form is attached hereto as Attachment C to this RFP document and Respondent is required to describe its form of business (i.e., individual, sole proprietor, corporation, non-profit corporation, partnership, limited liability company). This Form must be fully completed, executed and submitted under this tab as a part of the submittal by the Respondent. Also submit the Company Biography under this tab.

This information shall be included as Tab 3 of the Proposal.

C.4 Tab 4, Evaluation Factors: The Respondent must submit under this tab a response that addresses each of the following evaluation factors. Small/Minority/Woman/Veteran Owned Business Enterprise and Section 3 utilization plans are covered in Tabs 6 and 7 below.

A. Experience: Respondent shall provide a narrative describing the firm's credentials to deliver the required services including the firm's license information, number of employees, type of client base, and location of offices. Include awards or honors earned from industry organizations and publications. Respondent shall list current projects that the firm is presently committed, or will be committed, with client name, dollar amount, the start and completion dates, and the services being provided (e.g., Construction Manager, General Contractor, etc.). Respondent shall list at least two projects of similar type, scope, and complexity as the one contemplated herein that have been constructed within the past five (5) years or are being constructed by your firm and describe the services provided. Respondent shall provide information on two or more projects in the past 5 years reflecting Respondent's experience in utility, sewer and site work on multifamily housing by incorporation of sustainable use improvements and other innovative and modernizing products. Respondent shall state the extent to which it has worked with other governmental entities, including housing authorities, HUD, Non Profits, and multifamily industry.

B. Project Management: Respondent shall list the firm's management, supervisory, technical professional personnel, and consultants that will be assigned to the project and their time commitment in (a) the pre-construction phase and (b) the construction phase. Provide one-page résumés of key personnel with title/position, education, professional license or registration, general employment history, and experience with this type of project. Key personnel shall include at a minimum the project manager(s), superintendent(s), and pre-construction phase cost estimator. Provide relevant references names with contact information (email and phone number) for the project manager(s). Respondent shall provide a table identifying personnel named in this section that were assigned to projects listed in A and their job titles for that project. Respondent shall provide detail around project manager's experience reflecting a minimum of 10 years of project management experience in the rehabilitation and site improvements of low-rise, multi-story, multi-family construction rehabilitation and improvement projects. Respondent shall provide its estimated Number and type of sub-contractors to be utilized and the amount of work that it intends to self-perform..

C. Capacity/Financial Viability: Respondent shall provide a copy of the most recent audited (if available) annual and/or unaudited interim period financial statements. Respondent shall provide a short account of any legal conflict encountered with customers/clients dating to January 1, 2014 regarding contract disputes and non-performance. Respondent shall provide a letter from surety provider indicating bonding capacity and indicate currently available capacity.

D. Construction Plan: Respondent shall provide a comprehensive plan indicating how Respondent's firm will deliver the pre-construction and construction services required by this RFP. Respondent shall include a project organizational chart designating the lines of authority and discuss the roles and decision-making authority of each person on Respondent's team and specific experience each has with pre-construction services, constructability issues, modernization and energy usage techniques, and value engineering. Respondent shall provide a detailed construction schedule for the project based upon projected milestones and describe the method by which the Respondent intends to meet the schedule including any use of technology in the plan to control risks and schedule slippage. Respondent shall describe the methods it intends to use for a) tracking and reporting construction scope, schedule, and accounting information including contingency amount reporting, b) quality control program for construction, c) safety program for construction, d) construction documentation including the

use of technology to provide documentation to SAHA. Include information on Respondent's approach to maintaining a safe and secure work environment for workers and neighboring properties and indicate Respondent's approach to compliance with OSHA standards. Respondent shall provide its current safety EMR or equivalent rating.

E. Price Proposal: The Proposal (Attachment F) shall include the Respondent's not-to-exceed fee offer to perform all Services in the "Original" response only. The not-to-exceed fee offer shall include, without limitation, all of Respondent's costs, overhead, and profit for the complete performance of Services for the Project. Respondent shall provide a supporting schedule of values/Build of Materials.

This information shall be included as Tab 4 of the Proposal.

C.5 Tab 5, Small/Minority/Woman/Disadvantaged/Veteran Business Enterprise Utilization Plan: The Respondents shall submit a plan that details how the Contractor will make a good faith effort to subcontract with S/W/MBE companies**. *FAILURE TO PROVIDE THE SWMBE PLAN MAY CAUSE THE RESPONSE TO BE DISQUALIFIED AS NON-RESPONSIVE.***

This information shall be included as Tab 5 of the Proposal.

C.6 Tab 6, Proposal Checklist and Certification: Respondent shall certify that the Proposal documents are complete and included in the response and to the Certification contained in Attachment E.

This information shall be included as Tab 6 of the Proposal.

C.7 Tab 7, Subcontractors: Respondent shall identify its proposed subcontractors and provide a completed Profile of Firm form for each (Attachment C).

This information shall be included as Tab 7 of the Proposal.

End Section C.

Section D
Terms and Conditions

These Terms and Conditions shall be considered required terms of any Contract between the Successful Respondent and SAHA. The Contractor must also be familiar with federal guidelines issued by HUD. These guidelines, together with any supplemental general conditions issued by HUD, outline requirements for the conduct of work and administrative requirements. The guidelines include, but are not limited to, Termination for Convenience, Default, Clean Air and Water standards, and compliance with Davis-Bacon wage rates.

I. GENERAL RESPONSIBILITIES:

A. Specifications. The Contractor shall provide the Project in accordance with the Specifications which are included herein.

B. Regulatory/Licensing. Contractor shall comply with all applicable federal, state and local laws, rules, regulations, ordinances and codes and obtain any licenses or permits required to provide the services. Obtaining licenses and permits shall be the sole responsibility of the Contractor.

C. Timesheets. Contractor shall keep accurate timesheets for all employees assigned to perform any project, task, or assignment in the Project.

D. Unacceptable Employees: If any employee of the Contractor is deemed unacceptable by SAHA, Contractor shall immediately replace such personnel with a substitute acceptable to SAHA.

E. Uniforms/Badges: Contractor shall provide uniforms and/or ID badges for all employees working on SAHA's properties. No employee will be allowed on SAHA's properties out of uniform and/or without an ID badge.

F. Criminal history/Drug testing. Contractor shall perform criminal history checks and drug screening tests on all employees performing work and if requested provide summaries of the results to SAHA. Prospective employees whose criminal history checks discloses a misdemeanor or felony conviction involving crimes of moral turpitude or harm to persons or property shall not be used to perform work under this RFP or any resulting contract. Criminal history and drug screening checks will be completed at the sole expense of the Contractor.

G. Work on SAHA Property: The Contractor shall take all necessary precautions to prevent the occurrence of any injury to persons or property during the progress of such work and shall immediately return said property to a condition equal to or better than the existing condition prior to the commencement of work at the site at no cost to SAHA.

H. Wages. Contractor shall pay all salaries and expenses of, and all Federal, Social Security taxes, Federal and State Unemployment taxes, and any similar taxes relating to its employees used in the performance of the contract. The Contractor further agrees to comply with all Federal, State and local wage and hour laws and all licensing laws applicable to its employees or other personnel furnished under the agreement.

I. Independent Contractor: The Contractor shall be considered an independent contractor. Nothing herein shall create any association, agency, partnership or joint venture between the parties hereto and neither shall have any authority to bind the other in any way.

II. SECTION 3 REQUIREMENTS. NOT REQUIRED FOR THIS SOLICITATION

III. SUBCONTRACTORS. Contractor may not use any subcontractors to accomplish any portion of the services described within the RFP documents or the contract without the prior written permission of the SAHA. Also, any substitution of subcontractors must be approved in writing by SAHA prior to their engagement. All requirements for the "Prime" Contractor shall also apply to any and all subcontractors. It is the Contractors' responsibility to insure the compliance by the subcontractors. Regardless of subcontracting, the Contractor remains liable to SAHA for the performance under the contract. The Contractor shall assure that its subcontractors comply with all applicable HUD regulations and SAHA requirements including but not limited to Section 3 requirements, insurance, Davis Bacon wage requirements and reporting, permitting, code compliance, and licensure.

IV. LIMITATION/INDEMNIFICATION/INSURANCE

A. Limitation of Liability: In no event shall SAHA be liable to the successful Respondents for any indirect, incidental, consequential or exemplary damages.

B. Indemnification. The Contractor shall indemnify and hold harmless SAHA and its officers, agents, representatives, and employees from and against all claims, losses, damages, actions, causes of action and/or expenses resulting from, brought for, or on account of any bodily injury or death of an employee of the Contractor, its agent, or its subcontractor of any tier received or sustained by any persons or property growing out of, occurring, or attributable to any work performed under or related to this Agreement, to the extent resulting in whole or in part from the negligent acts or omissions of the Contractor, any subcontractor, or any employee, agent or representative of the Contractor or any subcontractor. **CONTRACTOR ACKNOWLEDGES AND AGREES THAT THIS INDEMNITY CONTROLS OVER ALL OTHER PROVISIONS IN THE AGREEMENT, SURVIVES TERMINATION OF THIS AGREEMENT.**

For clarification purposes**,** Contractor shall indemnify and hold harmless SAHA, their agents, consultants and employees from and against any and all property damage claims, losses, damages, costs and expenses relating to the performance of this Agreement, including any resulting loss of use, *but only to the extent caused by the negligent acts or omissions of Contractor*, its employees, sub-subcontractors, suppliers, manufacturers, or other persons or entities for whose acts Contractor may be liable.

C. SAHA Actions. It is agreed by and between the parties hereto that in no event shall any official, officer, employee, or agent of SAHA in any way be personally liable or responsible for any covenant or agreement herein contained whether expressed or implied, nor for any statement, representation or warranty made herein or in any connection with this agreement.

D. Insurance: The Contractor shall maintain in full force and effect during the entire contract term insurance in the form and in amounts found in Exhibit I.

V. **LIQUIDATED DAMAGES:** For each day that performance under the contract is delayed beyond the time specified for completion, the successful Respondents shall be liable for liquidated damages in the amount of $1,000 per day. However, the timeframe for performance may be adjusted at SAHA's discretion in writing prior to default under the contract.

VI. **WARRANTY:** The Respondent represents and warrants to the Customer that the Respondent will perform the Services with reasonable care and skill and in accordance with best commercial practices and standards in the industry for similar services.

VII. **INVOICING:**

A. Invoices. Invoices must contain a complete description of the work or service that was performed, the contract price for each service, the purchase order number, contract number (if applicable), date of service, and address of service location or delivery address. Contractor(s) must submit a separate invoice for each purchase order issued by SAHA unless prior approval is obtained from SAHA. To insure prompt and timely payment of invoices, and unless utilizing a progress payment schedule, invoices shall be sent electronically to the following address:

Accounts_Payable@saha.org

If the Contractor does not have the capability to send invoices electronically, they may be mailed to:

San Antonio Housing Authority
Finance and Accounting
P.O. Box 830428
San Antonio, TX 78283-0428

B. Progress Payments. If applicable, SAHA may make progress payments approximately every 30 days as the work proceeds if work meets owner's standards, as approved by the Contracting Officer. SAHA may, subject to written determination and approval of the Contracting Officer, make more frequent payments to contractors which are qualified small businesses in accordance with HUD documents.

C. Direct Deposit. Upon the Award of Contract, Contractor shall complete a form for direct deposit to process all payments electronically to insure prompt and efficient payment of all invoices.

D. Timely Invoicing: Contractor shall invoice SAHA within 60 days after the delivery of the goods or service. If contractor fails to invoice within 60 days SAHA reserves the right to not pay the invoice.

VIII. Laws and Regulations

A. General. SAHA is a governmental entity as that term is defined in the procurement statutes. SAHA and this RFP and all resulting contracts are subject to federal, state and local laws, rules, regulations and policies relating to procurement as applicable. Contractor shall comply with all local, state and federal laws concerning safety (OSHA) and environmental control (EPA and Bexar County Pollution Regulations) and any other enacted ordinance, code, law or regulation. Contractor shall be responsible for all costs incurred for compliance with any such possible ordinance, code, law or regulation. No time extensions shall be granted or financial consideration given to the Contractor for time or monies lost due to violations of any such ordinance, code, law or regulations that may occur.

B. Specific. Contractors shall comply with all statutes, rules, regulations, executive orders affecting procurements by Housing Authorities including but not limited to:

- Executive Order 11246
- Executive Order 11063
- Copeland "Anti-Kickback" Act (18 USC 874)
- Davis Bacon and Related Acts (40 USC 276a-276a-7)
- Clean Air & Water Acts (42 USC 1857(h); 33 USC 1368)
- Contract Work Hours & Safety Standards Act (40 USC 327-330)
- Energy Policy & Conservation Act (PL 94-163, 89 STAT 871)
- Civil Rights Act of 1964, Title VI (PL 88-352)
- Civil Rights Act of 1968, Title VIII (PL 90-284 Fair Housing Act)
- Age Discrimination Act of 1975
- Anti-Drug Abuse Act of 1988 (42 USC 11901 et. Seq.)
- HUD Information Bulletin 909-
- Immigration Reform & Control Act of 1986
- Fair Labor Standards Act (29 USC 201, et. Seq.

C. Incorporation. Each provision of law and each clause, which is required by law to be inserted in this RFP or any contract, shall be deemed to have been inserted herein, and this RFP and any resulting contract shall be read and enforced as though such provision or clause had been physically inserted herein. If, through mistake or otherwise, any such provision is not inserted or is inserted incorrectly, this agreement shall forthwith be physically amended to make such insertion or correction upon the application of either party. The fore-mentioned statutes, regulations and executive orders are not intended as an indication that such statute, regulation or executive order is necessary applicable nor is an omission of such statute, regulation or executive order intended to indicate that it is not applicable.

IX. Termination.

A. Early Termination. In the event any resulting contract is prematurely terminated due to non-performance and/or withdrawal by the Contractor, SAHA reserves the right to seek monetary restitution (to include but not limited to withholding of monies owed) from the Contractor to cover costs for interim services and/or cover the difference of a higher cost (difference between terminated Contractor's rate and new company's rate) beginning the date of Contractor's termination through the contract expiration date. The contract may be terminated under the following conditions:

a. Consent: By mutual consent of both parties, and

b. Termination For Cause: As detailed within the attached HUD Forms. SAHA may terminate any and all contracts for default at any time in whole or in part, if the Contractor fails to perform any of the provisions of any contract, so fails to pursue the work as to endanger performance in accordance with the terms of the RFP or any resulting contracts, and after receipt of written notice from SAHA, fails to correct such failures within seven (7) days or such other period as SAHA may authorize or require.

c. Failure to Fund. SAHA may terminate any contract resulting from this RFP in whole or in part, if funding is reduced, or is not obtained and continued at levels sufficient to allow for the expenditure.

d. Termination for Convenience: In the sole discretion of the Contracting Officer, SAHA may terminate any and all contracts resulting from this RFP in whole or part upon thirty days prior notice to the Contractor when it is determined to be in the best interest of SAHA**.**

B. Action Upon Termination. Upon receipt of a notice of termination issued from SAHA, the Contractor shall immediately cease all activities under any contract resulting from this RFP, unless expressly directed otherwise by SAHA in the notice of termination.

C. Remedies Cumulative. The rights and remedies of SAHA provided under this section are not exclusive and are in addition to any other rights and remedies provided by law or under any contract.

D. Rights Upon Termination. In the event the contract is terminated for any reason, or upon its expiration, SAHA shall retain ownership of all work products including deliverables, source and object code, microcode, software licenses, and documentation in whatever form that may exist. In addition to any other provision, the Contractor shall transfer title and deliver to SAHA any partially completed work products, deliverables, source and object code, or documentation that the Contractor has produced or acquired in the performance of the contract.

X. General Conditions

A. Severability: If any provision of this agreement or any portion or provision hereof applicable to any particular situation or circumstance is held invalid, the remainder of this agreement or the remainder of such provision (as the case may be), and the application thereof to other situations or circumstances shall not be affected thereby.

B. Waiver of Breach: A waiver of either party of any terms or conditions of this agreement in any instance shall not be deemed or construed as a waiver of such term or condition for the future, or of any subsequent breach thereof. All remedies, rights, undertakings, obligations, and agreements contained in this agreement shall be cumulative and none of them shall be in limitation of any other remedy, right, obligation or agreement of either party.

C. Time of the Essence: Time is of the essence as to each provision in which a timeframe for performance is provided in this RFP. Failure to meet these timeframes may be considered a material breach, and SAHA may pursue compensatory and/or liquidated damages under the contract.

D. Examination and Retention of Contractor's Records: SAHA, HUD, or Comptroller General of the United States, or any of their duly authorized representatives shall, until three years after final payment under all contracts executed as a result of this RFP, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audits, examinations, excerpts and transcriptions.

E. Right to data and Patent Rights: In addition to other ownership & use rights SAHA shall have exclusive ownership of all, proprietary interest in, and the right to full and exclusive possession of all information, materials, documents, software, and all electronic data discovered or produced by Contractor and/or subcontractors pursuant to the terms of the contract, including but not limited to, reports, memoranda or letters concerning the research and reporting tasks of the contract. Both parties agree to comply with HUD Bulletin 909-23, which is the Notice of Assistance Regarding Patent and Copyright Infringement.

F. **Force Majeure:** Neither SAHA nor Contractor shall be held responsible for delays or default caused by fire, flood, riot, acts of God or war where such cause was beyond, respectively, SAHA or Contractor's reasonable control. Contractor shall make all reasonable efforts to remove or eliminate such a cause of delay or default and shall, upon the cessation of the cause, diligently pursue performance of its obligations under this Agreement.

G. Proposed Fee:

G1. Base: All fees are all-inclusive of all related costs that a Respondent will incur to provide the noted services in compliance with this RFP, including, but not limited to: employee wages and benefits, clerical support, overhead, profit, licensing, insurance, materials, supplies, tools, equipment, long distance telephone calls, document copying and motor vehicle fuel unless otherwise specified in this RFP. Each fee proposed shall be fully "burdened" with profit and overhead costs.

G2. Additional: In addition this fee must include all costs to recruit, hire, supervise, and monitor oversight staff of management agent, train personnel, establish and supervise all systems to keep property's books, records and accounts, management agent's overhead expenses to include and not limited to office space, supplies and equipment, bookkeeping expenses of management agent, bonds and insurance. In case of a discrepancy between a unit price and an extension, the unit price prevails.

H. "Equal": Catalogs, brand names or manufacturer's references where provided are descriptive only and indicate type and quality desired. Bids on brands of like nature and quality will be considered unless specified otherwise. If bidding other than the referenced manufacturer, brand or trade name, Bidder must provide a complete description of product offered, and illustrations and must be included in the bid submittal. Failure to include the above referenced data will require Contractor to furnish specified brand names, numbers, etc.

I. Notice to Proceed: Start work date will be determined by the SAHA Project Manager and Contractor's Manager. Contractor shall not begin work until a Notice to Proceed is received from SAHA signed by the Contracting Officer.

J. Communications:

J1. Form: All claims, notices, demands, requests, instructions, approvals and proposals must be submitted in writing.

J2. Notice to Contractor: Any Notices or Demands upon the Contractor shall be sufficiently given if delivered at the office of the Contractor stated on the signature page of the Contract or at such other office as he / she may from time to time designate in writing to SAHA or deposited in the United States mail in a sealed, postage-prepaid envelope or if delivered with charges prepaid to any telegraph company for transmission and addressed to the office of the Contractor indicated on the signature page of the contract or such other address as may be subsequently specified in writing to SAHA.

J3. Notice to SAHA: All notification papers required to be delivered to SAHA or its designated representative shall, unless otherwise specified in writing to the Contractor, be delivered to attn. Procurement, SAHA at 818 South Flores, San Antonio, Texas, 78204; and any notice to or demand upon SAHA shall be sufficiently given if so delivered or deposited in the United States mail in a sealed, postage-prepaid envelope or delivered with charges prepaid to any telegraph company for transmission to SAHA at the above address or to such other address as SAHA may subsequently specify in writing to the Contractor for such purpose.

J4. Receipt: Any such notice shall be deemed to have been given as of the time of actual delivery; or in the case of mailing, when the same should have been received in due course after the date of surrender to the Post Office; or in the case of telegrams, at the time of actual receipt, as the case may be.

K. Time for Completion: The Contractor shall immediately mobilize and commence work at the time stipulated in the Notice to Proceed to the Contractor and shall be fully completed within **240 days** unless specified otherwise in contractor's response.

L. Safety: Subject to prior approval by SAHA as to size, design, type and location, and to local regulations, the Contractor and his / her subcontractors shall erect Temporary Safety Signs for purposes of identification and controlling traffic. The Contractor shall furnish, erect, and maintain such signs as may be required by safety regulations and as necessary to safeguard life and property.

M. Builders Risk: Contractor is required to acquire Builder's Risk Insurance for any project or projects resulting from this solicitation. In any case SAHA will not be responsible for any loss to Contractor's tools, materials, supplies, the building or project or any other coverage normally covered under Builder's Risk Insurance. See HUD form 5370 attached.

N. Storage: The Contractor and his/her subcontractors may maintain with approval by the SAHA Property & Project Managers various Storage Facilities on the site as may be necessary in the proper conduct of the work. These shall be located to cause no interference with any work to be performed on the site by the Contractor or others. The Contractor shall consult with SAHA regarding the location(s) of these facilities on each site.

O. Removal of Temporary Facilities: Upon completion of the project, or as directed by SAHA, the Contractor shall remove all temporary structures and facilities they installed from the site and leave the premises in equal or better condition than it was at turnover.

P. Final Inspection:

P.1 Notice: The Contractor shall provide prompt written notification to SAHA when all work is completed. A final project inspection shall be made when all work is completed. Until the final inspection has been made and project accepted by SAHA, SAHA shall not advance any of the retainage or make the final payment to the Contractor without the approval and concurrence of the Contracting Officer.

P.2 Inspection Date: Upon receipt of the Contractor's notification of the date when the work has been completed, SAHA shall conduct a final Inspection within 2 calendar days.

P.3 **Inspection Participants:** The final inspection shall be conducted by a SAHA representative/s, any System Manufacturer's Representative/s, and the Contractor's representative/s at a minimum.

P.4 **Inspection Conference:** The inspection team shall meet after completing the final inspection to determine whether the work has been completed in accordance with these specifications and produce a Punch List Schedule which describes any minor items of incomplete or unsatisfactory work and document if there are any major deficiencies which must be corrected by the Contractor and additional inspections scheduled prior to contract settlement.

Q. Settlement Documents: The settlement document shall state that the work was completed in accordance with the construction documents, including change orders except any minor items identified on SAHA's proposed certificate of completion, the total amount due the Contractor and a separately stated amount for each unsettled claim against SAHA. It shall also state that SAHA is released of all liens and all claims except those expressly stated in the Contractor's release and that wages paid to laborers or mechanics were consistent with the wage rate requirements of the contract and there are no outstanding claims for unpaid wages, materials, or supplies.

R. Wage Rate: The Davis Bacon and Related Acts wage and reporting requirements apply to this project.

End Section D.

EXHIBIT I
Insurance Requirements

Developer is required to have in place during the term of the contract the following minimum insurance requirements. Developer will be required to provide an original Certificate of Insurance to SAHA within 10 days of contract signature:

Professional Liability	**Required Limits**
SAHA and its affiliates must be named as a Certificate Holder. This is required for vendors who render observational services to SAHA such as appraisers, inspectors, attorneys, engineers or consultants.	~~$1,000,000~~ Not Required for this Project
Business Automobile Liability	**Required Limits**
SAHA and its affiliates must be named as an additional insured and as the certificate holder. This is required for any vendor that will be using their vehicle(s) to do work on SAHA properties.	$500,000 combined Single limit, Per occurrence
Workers Compensation and Employer's Liability	**Required Limits**
Workers' Compensation coverage is Statutory and has no pre-set limits. Employer's Liability limit is $500,000. Workers' Compensation is required for any vendor made up of more than two persons. ***A Waiver of Subrogation in favor of SAHA must be included in the Workers' Compensation policy.*** SAHA and its affiliates must be a Certificate Holder.	**Statutory** Employer's Liability is $500,000
Commercial General Liability	**Required Limits**
This is required for any vendor who will be doing hands on work at SAHA properties. SAHA and its affiliates must be named as an Additional Insured and as the Certificate Holder.	$1,000,000 per accident $2,000,000 aggregate
Builders Risk	**Required Limits**
Builder shall carry Builder's Risk to cover the loss of materials, and/or the building under construction/rehabilitation. SAHA and its affiliates must be named as an Additional Insured and as the Certificate Holder.	Equal to the Contract Cost of the construction or rehabilitation project stated in the contract.

ATTACHMENT A
Specifications and Drawings

DOCUMENT 000101 - PROJECT TITLE PAGE

1.1 PROJECT MANUAL

A. Project Name:
TREE REMOVAL AND SANITARY SEWER RETROFIT.
Pecan Hill Apartments
1600 West Lawndale
San Antonio, Texas

B. Owner:
San Antonio Housing Authority.
818 S. Flores Street
San Antonio, Texas 78204

C. Project Manager/Engineer:
Raba Kistner Consultants Inc.
12821 W. Golden Lane
San Antonio, Texas 78249
www.rkci.com
Phone: 210-699-9090
Fax: 210-699-6426

Engineer Project No. ASR17-027-00.

D. Issued: 3 December 2018.

END OF DOCUMENT 000101

DOCUMENT 000107 - SEALS PAGE

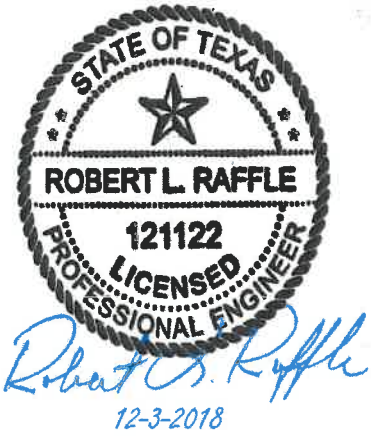
1.1 DESIGN PROFESSIONALS OF RECORD

A. Civil Engineer:

1. Laurie M. Steves.
2. License # 130956.
3. Responsible for all work except as noted below.

B. MEP Engineer:

1. Robert L. Raffle
2. License # 121122
3. Responsible for Sanitary Sewer System Retrofit.



END OF DOCUMENT 000107

DOCUMENT 009113 – PRE-BID ADDENDA 1

1.1 PROJECT INFORMATION

A. Project Name: TREE REMOVAL AND SANITARY SEWER RETROFIT.

B. Owner: San Antonio Housing Authority.

C. Engineer: Raba Kistner Consultants, Inc..

D. Engineer Project Number: ASR17-027-00.

E. Date of Addendum: November 21, 2019.

1.2 NOTICE TO BIDDERS

A. This Addendum is issued to all registered plan holders pursuant to the Instructions to Bidders. This Addendum serves to clarify, revise, and supersede information in the Project Manual, Drawings, and previously issued Addenda. Portions of the Addendum affecting the Contract Documents will be incorporated into the Contract by enumeration of the Addendum in the Owner/Contractor Agreement.

B. The Bidder shall acknowledge receipt of this Addendum in the appropriate space on the Bid Form.

C. The date for receipt of bids is unchanged by this Addendum, at same time and location.

1.3 ATTACHMENTS

A. This Addendum includes no attachments.

1.4 REVISIONS TO DIVISION 01 GENERAL REQUIREMENTS

A. Specification Section 012200, UNIT PRICES
1. Paragraph 3.1 SCHEDULE OF UNIT PRICES has been superseded by the following Unit Price Sheet. Quantities should be estimated from the drawings unless otherwise noted in the table below:

	DESCRIPTION	U.O.M	EST. QUANTITY	UNIT PRICE	EXTENDED COST
1	Hauling, Spoils	CuYd			
2	Pavement Base	CuYd			
3	Asphalt Pavement	SQFT			

4	Tunneling	CuYd			
5	Flowable Fill	CuYd			
6	Concrete	CuYd			
7	Hydrostatic Testing (potable water)	EA			
8	Hydrostatic Testing (Sanitary Sewer)	EA			
9	Leak Detection	Hr.			
10	Sanitary Sewer Pipe – 1-1/2 in.	LF			
11	Sanitary Sewer Pipe – 2 in/	LF			
12	Sanitary Sewer Pipe – 4 in.	LF			
13	Sanitary Sewer Pipe – 6 in.	LF			
14	Sanitary Sewer Pipe – 8 in.	LF			
15	Sewer Fitting Coupling – 1-1/2 in.	EA			
16	Sewer Fitting Coupling – 2 in.	EA			
17	Sewer Fitting Coupling – 4 in.	EA			
18	Sewer Fitting Coupling – 6 in.	EA			
19	Sewer Fitting Coupling – 8 in.	EA			
20	Sewer Fitting 90° - 1-1/2 in.	EA			
21	Sewer Fitting 90° - 2 in.	EA			
22	Sewer Fitting 90° - 4 in.	EA			
23	Sewer Fitting 90° - 6 in.	EA			
24	Sewer Fitting 90° - 8 in.	EA			
25	Sewer Fitting (T) Tee – 1-1/2 in.	EA			
26	Sewer Fitting (T) Tee – 2 in.	EA			
27	Sewer Fitting (T) Tee – 4 in.	EA			
28	Sewer Fitting (T) Tee – 6 in.	EA			
29	Sewer Fitting (T) Tee – 8 in.	EA			
30	Sewer Fitting (Y) Wye – 1-1/2 in.	EA			
31	Sewer Fitting (Y) Wye – 2 in.	EA			
32	Sewer Fitting (Y) Wye – 4 in.	EA			

33	Sewer Fitting (Y) Wye – 6 in.	EA			
34	Sewer Fitting (Y) Wye – 8 in.	EA			
35	Plumbing repair (1/2" Galvanized pipe)	EA			
36	Plumbing repair (3/4" Galvanized pipe)	EA			
37	Plumbing repair (1" Galvanized pipe)	EA			
38	Plumbing repair (1-1/4" Galvanized pipe)	EA			
39	Plumbing repair (1-1/2" Galvanized pipe)	EA			
40	Plumbing repair (2" Galvanized pipe)	EA			
41	Plumbing repair (1/2" Galvanized retofit & Install Brass Ball Valve)	EA			
42	Plumbing repair (3/4" Galvanized retofit & Install Brass Ball Valve)	EA			
43	Plumbing repair (1" Galvanized retofit & Install Brass Ball Valve)	EA			
44	Plumbing repair (1-1/4" Galvanized retofit & Install Brass Ball Valve)	EA			
45	Plumbing repair (1-1/2" Galvanized retofit & Install Brass Ball Valve)	EA			
46	Plumbing repair (2" Galvanized retofit & Install Brass Ball Valve)	EA			
47	Plumbing repair (1/2" Galvanized fitting 90˚)	EA			
48	Plumbing repair (3/4" Galvanized fitting 90˚)	EA			
49	Plumbing repair (1" Galvanized fitting 90˚)	EA			
50	Plumbing repair (1-1/4" Galvanized fitting 90˚)	EA			
51	Plumbing repair (1-1/2" Galvanized fitting 90˚)	EA			
52	Plumbing repair (2" Galvanized, fitting 90˚)	EA			
53	Plumbing repair (1/2" Galvanized fitting, (T) Tee)	EA			
54	Plumbing repair (3/4" Galvanized fitting, (T) Tee)	EA			
55	Plumbing repair (1" Galvanized fitting, (T) Tee)	EA			
56	Plumbing repair (1-1/4" Galvanized fitting, (T) Tee)	EA			
57	Plumbing repair (1-1/2" Galvanized fitting, (T) Tee)	EA			
58	Plumbing repair (2" Galvanized fitting, (T)	EA			

	Tee)				
59	Plumbing repair (1/2" Galvanized fitting, (Y) WYE)	EA			
60	Plumbing repair (3/4" Galvanized fitting, (Y) WYE)	EA			
61	Plumbing repair (1" Galvanized fitting, (Y) WYE)	EA			
62	Plumbing repair (1-1/4" Galvanized fitting, (Y) WYE)	EA			
63	Plumbing repair (1-1/2" Galvanized fitting, (Y) WYE)	EA			
64	Plumbing repair (2" Galvanized fitting, (Y) WYE)	EA			
65	Plumbing repair (1/2" Galvanized fitting, Coupling)	EA			
66	Plumbing repair (3/4" Galvanized fitting, Coupling)	EA			
67	Plumbing repair (1" Galvanized fitting, Coupling)	EA			
68	Plumbing repair (1-1/4" Galvanized fitting, Coupling)	EA			
69	Plumbing repair (1-1/2" Galvanized fitting, Coupling)	EA			
70	Plumbing repair (2" Galvanized fitting, Coupling)	EA			
71	Plumbing repair (1/2" Copper (L Hard) pipe)	EA			
72	Plumbing repair (3/4" Copper (L Hard) pipe)	EA			
73	Plumbing repair (1" Copper (L Hard) pipe)	EA			
74	Plumbing repair (1-1/4" Copper (L Hard) pipe)	EA			
75	Plumbing repair (1-1/2" Copper (L Hard) pipe)	EA			
76	Plumbing repair (2" Copper (L Hard) pipe)	EA			
77	Plumbing repair (1/2" Copper fitting 90˚)	EA			
78	Plumbing repair (3/4" Copper fitting 90˚)	EA			
79	Plumbing repair (1" Copper fitting 90˚)	EA			
80	Plumbing repair (1-1/4" Copper fitting 90˚)	EA			
81	Plumbing repair (1-1/2" Copper fitting 90˚)	EA			
82	Plumbing repair (2" Copper, fitting 90˚)	EA			
83	Plumbing repair (1/2" Copper fitting, (T) Tee)	EA			

84	Plumbing repair (3/4" Copper fitting, (T) Tee)	EA			
85	Plumbing repair (1" Copper fitting, (T) Tee)	EA			
86	Plumbing repair (1-1/4" Copper fitting, (T) Tee)	EA			
87	Plumbing repair (1-1/2" Copper fitting, (T) Tee)	EA			
88	Plumbing repair (2" Copper fitting, (T) Tee)	EA			
89	Plumbing repair (1/2" Copper fitting, (Y) WYE)	EA			
90	Plumbing repair (3/4" Copper fitting, (Y) WYE)	EA			
91	Plumbing repair (1" Copper fitting, (Y) WYE)	EA			
92	Plumbing repair (1-1/4" Copper fitting, (Y) WYE)	EA			
93	Plumbing repair (1-1/2" Copper fitting, (Y) WYE)	EA			
94	Plumbing repair (2" Copper fitting, (Y) WYE)	EA			
95	Plumbing repair (1/2" Copper fitting, Coupling)	EA			
96	Plumbing repair (3/4" Copper fitting, Coupling)	EA			
97	Plumbing repair (1" Copper fitting, (Y) WYE)	EA			
98	Plumbing repair (1-1/4" Copper fitting, (Y) WYE)	EA			
99	Plumbing repair (1-1/2" Copper fitting, (Y) WYE)	EA			
100	Plumbing repair (2" Copper fitting, (Y) WYE)	EA			
101	Plumbing repair (1/2" Copper fitting, Coupling)	EA			
102	Plumbing repair (3/4" Copper fitting, Coupling)	EA			
103	Plumbing repair (1" Copper fitting, Coupling)	EA			
104	Plumbing repair (1-1/4" Copper fitting, Coupling)	EA			
105	Plumbing repair (1-1/2" Copper fitting, Coupling)	EA			
106	Plumbing repair (2" Copper fitting, Coupling)	EA			
107	Concrete Splash Blocks	EA	20		
108	R&R Concrete Curb match existing	LF	75		
109	R&R Asphalt Repair	SQFT	150		

110	Hot Asphalt Crack Sealant Repair (Prep/Installation)	LF	800		
111	Curb Painting	LF	225		
112	Asphalt stripping 4"	SQFT	90		
113	No Parking Fire lane Sign & Pole installed	EA	5		
114	Shrub Removal	EA	10		
115	Shrub Pruning	CY	20		
116	Landscape steel edging	LF	175		
117	Weed barrier	CY	20		
118	Mulch	CY	20		
119	Zeon Zoysia Sod	SQFT	1000		
120	Zeon Zoysia Sod, weed killer, top soil, fertilizers	SQFT	100		
121	Site Grading	CY	100		
122	Tree Pruning	CY	20		
123	Landscape Maintenance - Establishment Period (per Month)	MO	2		
124	Top soil (Landscape Mix)	CY	600		
125	Nolina Foothill (1.25 QT)	EA	3		
126	Aztec Grass (1.25 QT)	EA	30		
127	Dalea Black (1 gallon)	EA	4		
128	Rosemary (1 gallon)	EA	4		
129	Lavender (1 gallon)	EA	4		
130	Esperanza (1 gallon)	EA	4		
131	Gaillardia Red (1 Flat)	EA	4		
132	Indian Paint Brush (1 Flat)	EA	4		
133	Bougainvillea (1 Flat)	EA	4		
134	Texas Red Bud (1.5"0)	EA	6		
135	Mountain Laurel (1.5"0)	EA	6		

B. Specification Section 015000, TEMPORARY FACILITIES AND CONTROLS (not reissued).
   1. Paragraph 2.2 TEMPORARY FACILITIES:
      a. Subsection A: Field Offices, General: Contractor will provide their own field office.
   2. Paragraph 3.3 TEMPORARY UTILITY INSTALLATION, (not reissued).
      a. Subsection F: Contractor will provide, at their own expense, electric power service.
      b. Subsection H: Contractor is not required to provide telephone service to their field office; however, a cell phone number must be provided where the Contractor can be reached.
   3. Paragraph 3.4 SUPPORT FACILITIES INSTALLATION
      a. Subsection H: Contractor will not be permitted use of the elevator.

1.5 REVISIONS TO DIVISIONS 31, EARTHWORK

A. Specification Section 312000 EARTH MOVING, (not reissued).

   1. 3.7 EXCAVATION FOR ELEVATOR CYLINDER. This section to be removed

END OF DOCUMENT 009113

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DOCUMENT 000115 - LIST OF DRAWING SHEETS

1.1 LIST OF DRAWINGS

A. List of Drawings: Drawings consist of the following Contract Drawings:

1. CS0.0 COVER SHEET
2. C1.0 TREE REMOVAL PLAN
3. C1.1 NEW LANDSCAPE ISLAND PLAN
4. C2.0 DRAINAGE RETROFIT PLAN
5. C2.1 DRAINAGE RETROFIT PLAN
6. P1.0 SANITARY SEWER RETROFIT PLAN
7. P1.1 SANITARY SEWER RETROFIT PLAN
8. P1.2 SANITARY SEWER MAIN LINE ELEVATIONS
9. P1.3 CONCRETE AND ASPHALT PATCH DETAILS

END OF DOCUMENT 000115

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and Drawing conventions.

1.3 PROJECT INFORMATION

A. Project Identification: Tree Removal and Sanitary Sewer Retrofit.

1. Project Location: Pecan Hill Apartments, 1600 West Lawndale, San Antonio, Texas.

B. Owner: San Antonio Housing Authority, 818 S. Flores St., San Antonio, Texas 78204.

1. Owner's Representative: Marvin Williams, Construction Project Manager, Ph: 210-477-6407.

C. Engineer: Raba Kistner Consultants, Inc., 12821 W. Golden Lane, San Antonio, Texas 78249.

1. Engineer’s Representative: Laurie M. Steves, PE, Project Manager, Ph: 210-699-9090.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Removal of trees that are impacting the buildings’ foundations.

2. Construction of landscaping islands.

3. Construction of site drainage improvements including the construction of a new swale.

4. Retrofit of the existing sanitary sewer system.

5. Installation of new manholes and cleanouts.

6. Other work as described in the Contract Drawings and Specifications or required by work described to provide a complete and operable installation.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to Work in areas defined by the Project Schedule. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and existing building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.

2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

3. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
4. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 8 a.m. to 5 p.m., Monday through Friday, unless otherwise indicated.

1. Hours for Utility Shutdowns: Coordinate with Engineer and Owner.
2. Hours for Core Drilling Coordinate with Engineer and Owner.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Engineer and Owner not less than two days in advance of proposed utility interruptions.
2. Obtain Owner’s written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1. Notify Engineer and Owner not less than two days in advance of proposed disruptive operations.
2. Obtain Owner’s written permission before proceeding with disruptive operations.

E. Restricted Substances: Use of tobacco products and other controlled substances within the existing building and on Project site is not permitted.

F. Employee Identification: Owner will provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

G. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

1.8 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Section:

1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.2 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

	DESCRIPTION	U.O.M	UNIT PRICE
1	Hauling, Spoils	CuYd	
2	Pavement Base	CuYd	
3	Asphalt Pavement	SF	
4	Tunneling	CuYd	
5	Flowable Fill	CuYd	
6	Concrete	CuYd	
7	Hydrostatic Testing (potable water)	EA	
8	Hydrostatic Testing (Sanitary Sewer)	EA	
9	Leak Detection	Hr.	
10	Sanitary Sewer Pipe – 1-1/2 in.	LF	
11	Sanitary Sewer Pipe – 2 in/	LF	
12	Sanitary Sewer Pipe – 4 in.	LF	
13	Sanitary Sewer Pipe – 6 in.	LF	
14	Sanitary Sewer Pipe – 8 in.	LF	
15	Sewer Fitting Coupling – 1-1/2 in.	EA	
16	Sewer Fitting Coupling – 2 in.	EA	
17	Sewer Fitting Coupling – 4 in.	EA	
18	Sewer Fitting Coupling – 6 in.	EA	
19	Sewer Fitting Coupling – 8 in.	EA	
20	Sewer Fitting 90° - 1-1/2 in.	EA	
21	Sewer Fitting 90° - 2 in.	EA	
22	Sewer Fitting 90° - 4 in.	EA	
23	Sewer Fitting 90° - 6 in.	EA	

24	Sewer Fitting 90° - 8 in.	EA	
25	Sewer Fitting (T) Tee – 1-1/2 in.	EA	
26	Sewer Fitting (T) Tee – 2 in.	EA	
27	Sewer Fitting (T) Tee – 4 in.	EA	
28	Sewer Fitting (T) Tee – 6 in.	EA	
29	Sewer Fitting (T) Tee – 8 in.	EA	
30	Sewer Fitting (Y) Wye – 1-1/2 in.	EA	
31	Sewer Fitting (Y) Wye – 2 in.	EA	
32	Sewer Fitting (Y) Wye – 4 in.	EA	
33	Sewer Fitting (Y) Wye – 6 in.	EA	
34	Sewer Fitting (Y) Wye – 8 in.	EA	
35	Plumbing repair (1/2" Galvanized pipe)	EA	
36	Plumbing repair (3/4" Galvanized pipe)	EA	
37	Plumbing repair (1" Galvanized pipe)	EA	
38	Plumbing repair (1-1/4" Galvanized pipe)	EA	
39	Plumbing repair (1-1/2" Galvanized pipe)	EA	
40	Plumbing repair (2" Galvanized pipe)	EA	
41	Plumbing repair (1/2" Galvanized retofit & Install Brass Ball Valve)	EA	
42	Plumbing repair (3/4" Galvanized retofit & Install Brass Ball Valve)	EA	
43	Plumbing repair (1" Galvanized retofit & Install Brass Ball Valve)	EA	
44	Plumbing repair (1-1/4" Galvanized retofit & Install Brass Ball Valve)	EA	
45	Plumbing repair (1-1/2" Galvanized retofit & Install Brass Ball Valve)	EA	
46	Plumbing repair (2" Galvanized retofit & Install Brass Ball Valve)	EA	
47	Plumbing repair (1/2" Galvanized fitting 90˚)	EA	
48	Plumbing repair (3/4" Galvanized fitting 90˚)	EA	
49	Plumbing repair (1" Galvanized fitting 90˚)	EA	
50	Plumbing repair (1-1/4" Galvanized fitting 90˚)	EA	
51	Plumbing repair (1-1/2" Galvanized fitting 90˚)	EA	

52	Plumbing repair (2" Galvanized, fitting 90˚)	EA	
53	Plumbing repair (1/2" Galvanized fitting, (T) Tee)	EA	
54	Plumbing repair (3/4" Galvanized fitting, (T) Tee)	EA	
55	Plumbing repair (1" Galvanized fitting, (T) Tee)	EA	
56	Plumbing repair (1-1/4" Galvanized fitting, (T) Tee)	EA	
57	Plumbing repair (1-1/2" Galvanized fitting, (T) Tee)	EA	
58	Plumbing repair (2" Galvanized fitting, (T) Tee)	EA	
59	Plumbing repair (1/2" Galvanized fitting, (Y) WYE)	EA	
60	Plumbing repair (3/4" Galvanized fitting, (Y) WYE)	EA	
61	Plumbing repair (1" Galvanized fitting, (Y) WYE)	EA	
62	Plumbing repair (1-1/4" Galvanized fitting, (Y) WYE)	EA	
63	Plumbing repair (1-1/2" Galvanized fitting, (Y) WYE)	EA	
64	Plumbing repair (2" Galvanized fitting, (Y) WYE)	EA	
65	Plumbing repair (1/2" Galvanized fitting, Coupling)	EA	
66	Plumbing repair (3/4" Galvanized fitting, Coupling)	EA	
67	Plumbing repair (1" Galvanized fitting, Coupling)	EA	
68	Plumbing repair (1-1/4" Galvanized fitting, Coupling)	EA	
69	Plumbing repair (1-1/2" Galvanized fitting, Coupling)	EA	
70	Plumbing repair (2" Galvanized fitting, Coupling)	EA	
71	Plumbing repair (1/2" Copper (L Hard) pipe)	EA	
72	Plumbing repair (3/4" Copper (L Hard) pipe)	EA	
73	Plumbing repair (1" Copper (L Hard) pipe)	EA	
74	Plumbing repair (1-1/4" Copper (L Hard) pipe)	EA	
75	Plumbing repair (1-1/2" Copper (L Hard) pipe)	EA	
76	Plumbing repair (2" Copper (L Hard) pipe)	EA	
77	Plumbing repair (1/2" Copper fitting 90˚)	EA	
78	Plumbing repair (3/4" Copper fitting 90˚)	EA	
79	Plumbing repair (1" Copper fitting 90˚)	EA	
80	Plumbing repair (1-1/4" Copper fitting 90˚)	EA	

81	Plumbing repair (1-1/2" Copper fitting 90˚)	EA	
82	Plumbing repair (2" Copper, fitting 90˚)	EA	
83	Plumbing repair (1/2" Copper fitting, (T) Tee)	EA	
84	Plumbing repair (3/4" Copper fitting, (T) Tee)	EA	
85	Plumbing repair (1" Copper fitting, (T) Tee)	EA	
86	Plumbing repair (1-1/4" Copper fitting, (T) Tee)	EA	
87	Plumbing repair (1-1/2" Copper fitting, (T) Tee)	EA	
88	Plumbing repair (2" Copper fitting, (T) Tee)	EA	
89	Plumbing repair (1/2" Copper fitting, (Y) WYE)	EA	
90	Plumbing repair (3/4" Copper fitting, (Y) WYE)	EA	
91	Plumbing repair (1" Copper fitting, (Y) WYE)	EA	
92	Plumbing repair (1-1/4" Copper fitting, (Y) WYE)	EA	
93	Plumbing repair (1-1/2" Copper fitting, (Y) WYE)	EA	
94	Plumbing repair (2" Copper fitting, (Y) WYE)	EA	
95	Plumbing repair (1/2" Copper fitting, Coupling)	EA	
96	Plumbing repair (3/4" Copper fitting, Coupling)	EA	
97	Plumbing repair (1" Copper fitting, (Y) WYE)	EA	
98	Plumbing repair (1-1/4" Copper fitting, (Y) WYE)	EA	
99	Plumbing repair (1-1/2" Copper fitting, (Y) WYE)	EA	
100	Plumbing repair (2" Copper fitting, (Y) WYE)	EA	
101	Plumbing repair (1/2" Copper fitting, Coupling)	EA	
102	Plumbing repair (3/4" Copper fitting, Coupling)	EA	
103	Plumbing repair (1" Copper fitting, Coupling)	EA	
104	Plumbing repair (1-1/4" Copper fitting, Coupling)	EA	
105	Plumbing repair (1-1/2" Copper fitting, Coupling)	EA	
106	Plumbing repair (2" Copper fitting, Coupling)	EA	

END OF SECTION 012200

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

A. Engineer will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710.

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request or 10 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
    e. Quotation Form: Use forms acceptable to Engineer.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Engineer.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Engineer.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Change Proposal Request, Owner will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Owner may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Digital project management procedures.
5. Project meetings.

B. Related Requirements:

1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request for Information. Request from Owner, Engineer, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days prior to starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, and in prominent location in built facility. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop

Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

    a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
    e. Indicate required installation sequences.
    f. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Engineer indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
2. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

B. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
2. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format and PDF format.
3. Engineer will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.

    a. Engineer makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.

1.7 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Engineer will return without response those RFIs submitted to Engineer by other entities controlled by Contractor.

2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Engineer.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: AIA Document G716 or Software-generated form with substantially the same content as indicated above, acceptable to Engineer.

1. Attachments shall be electronic files in PDF format.

D. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow seven working days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Engineer's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt by Engineer of additional information.
3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly Insert time. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Engineer.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Engineer's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

F. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven days if Contractor disagrees with response.

1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Engineer's Digital Data Files: Digital data files of Engineer's CAD drawings will be provided by Engineer for Contractor's use during construction.

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project record Drawings.
2. Engineer makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
3. Digital Drawing Software Program: Contract Drawings are available in AutoCAD or DXF format.

B. PDF Document Preparation: Where PDFs are required to be submitted to Engineer, prepare as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.

3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.9 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within three days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Responsibilities and personnel assignments.
b. Tentative construction schedule.
c. Phasing.
d. Critical work sequencing and long lead items.
e. Designation of key personnel and their duties.
f. Lines of communications.
g. Procedures for processing field decisions and Change Orders.
h. Procedures for RFIs.
i. Procedures for testing and inspecting.
j. Procedures for processing Applications for Payment.
k. Distribution of the Contract Documents.
l. Submittal procedures.
m. Preparation of Record Documents.
n. Use of the premises and existing building.
o. Work restrictions.
p. Working hours.
q. Owner's occupancy requirements.
r. Responsibility for temporary facilities and controls.
s. Procedures for disruptions and shutdowns.
t. Construction waste management and recycling.
u. Parking availability.

v. Office, work, and storage areas.
w. Equipment deliveries and priorities.
x. First aid.
y. Security.
z. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Engineer and Owner of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Compatibility requirements.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written instructions.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Engineer, but no later than 30 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

    a. Preparation of Record Documents.
    b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    c. Procedures for completing and archiving web-based Project software site data files.
    d. Submittal of written warranties.
    e. Requirements for preparing operations and maintenance data.
    f. Requirements for demonstration and training.
    g. Preparation of Contractor's punch list.
    h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    i. Submittal procedures.
    j. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at weekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site use.
8) Temporary facilities and controls.
9) Progress cleaning.
10) Quality and work standards.
11) Status of correction of deficient items.
12) Field observations.
13) Status of RFIs.
14) Status of Proposal Requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

F. Coordination Meetings: Conduct Project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
    c. Review present and future needs of each contractor present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Off-site fabrication.
        6) Access.
        7) Site use.
        8) Temporary facilities and controls.
        9) Work hours.
        10) Hazards and risks.
        11) Progress cleaning.
        12) Quality and work standards.
        13) Status of RFIs.
        14) Proposal Requests.
        15) Change Orders.
        16) Pending changes.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Contractor's Construction Schedule.
3. Construction schedule updating reports.
4. Daily construction reports.
5. Material location reports.
6. Site condition reports.
7. Unusual event reports.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file, where indicated.
2. PDF file.

B. Startup construction schedule.

1. Submittal of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
3. Total Float Report: List of activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.

F. Construction Schedule Updating Reports: Submit with Applications for Payment.

G. Daily Construction Reports: Submit at weekly intervals.

H. Material Location Reports: Submit at weekly intervals.

I. Site Condition Reports: Submit at time of discovery of differing conditions.

J. Unusual Event Reports: Submit at time of unusual event.

K. Qualification Data: For scheduling consultant.

1.5 QUALITY ASSURANCE

A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, work stages, area separations and interim milestones.
4. Review submittal requirements and procedures.
5. Review time required for review of submittals and resubmittals.
6. Review requirements for tests and inspections by independent testing and inspecting agencies.
7. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
8. Review and finalize list of construction activities to be included in schedule.
9. Review procedures for updating schedule.

1.6 COORDINATION

A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.7 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

B. Time Frame: Extend schedule from date established for commencement of the Work to date of final completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Engineer.

2. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
3. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
4. Commissioning Time: Include no fewer than 15 days for commissioning.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.
6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work Restrictions: Show the effect of the following items on the schedule:
   a. Limitations of continued occupancies.
   b. Uninterruptible services.
   c. Use-of-premises restrictions.
   d. Seasonal variations.
   e. Environmental control.

3. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

   a. Subcontract awards.
   b. Submittals.
   c. Purchases.
   d. Deliveries.
   e. Installation.
   f. Tests and inspections.
   g. Adjusting.
   h. Startup and placement into final use and operation.
   i. Commissioning.

4. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
   a. Temporary enclosure and space conditioning.

b. Permanent space enclosure.
c. Substantial Completion.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.
2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.
5. Pending modifications affecting the Work and the Contract Time.

G. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

H. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

I. Distribution: Distribute copies of approved schedule to Engineer, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.8 STARTUP CONSTRUCTION SCHEDULE

A. Gantt-Chart Schedule: Submit startup, horizontal, Gantt-chart-type construction schedule within seven days of date established for commencement of the Work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

1.9 GANTT-CHART SCHEDULE REQUIREMENTS

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for the Notice of Award.

1. Base schedule on the startup construction schedule and additional information received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.10 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. Approximate count of personnel at Project site.
3. Equipment at Project site.
4. Material deliveries.
5. Testing and inspection.
6. Accidents.
7. Meetings and significant decisions.
8. Unusual events.
9. Stoppages, delays, shortages, and losses.
10. Meter readings and similar recordings.
11. Emergency procedures.
12. Orders and requests of authorities having jurisdiction.
13. Change Orders received and implemented.
14. Construction Change Directives received and implemented.
15. Services connected and disconnected.
16. Equipment or system tests and startups.
17. Partial completions and occupancies.
18. Substantial Completions authorized.

B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

C. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, and responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1. Submit unusual event reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Preconstruction photographs.
2. Periodic construction photographs.
3. Final completion construction photographs.

B. Related Requirements:

1. Section 017700 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.
2. Section 024119 "Selective Demolition" for photographic documentation before selective demolition operations commence.

1.3 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit image files within three days of taking photographs.

1. Submit photos on CD-ROM or thumb-drive. Include copy of key plan indicating each photograph's location and direction.
2. Identification: Provide the following information with each image description in file metadata tag:

a. Name of Project.
b. Name of Engineer.
c. Name of Contractor.
d. Date photograph was taken.
e. Description of location, vantage point, and direction.
f. Unique sequential identifier keyed to accompanying key plan.

1.4 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.5 FORMATS AND MEDIA

A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels, and with vibration-reduction technology. Use flash in low light levels or backlit conditions.

B. Metadata: Record accurate date and time from camera.

C. File Names: Name media files with Project area and sequential numbering suffix.

1.6 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs with maximum depth of field and in focus.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Preconstruction Photographs: Before starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Engineer.

1. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
2. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

C. Periodic Construction Photographs: Take a minimum of 20 photographs weekly. Select vantage points to show status of construction and progress since last photographs were taken.

D. Final Completion Construction Photographs: Take a minimum of 20 photographs after date of Substantial Completion for submission as Project Record Documents. Engineer will inform photographer of desired vantage points.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
3. Section 013233 "Photographic Documentation" for submitting preconstruction photographs, periodic construction photographs, and final completion construction photographs.
4. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
5. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
6. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal Category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Engineer's final release or approval.

1.5 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Engineer.
4. Name of Contractor.
5. Name of firm or entity that prepared submittal.
6. Names of subcontractor, manufacturer, and supplier.
7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
8. Category and type of submittal.
9. Submittal purpose and description.
10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
11. Drawing number and detail references, as appropriate.

12. Indication of full or partial submittal.
13. Other necessary identification.
14. Remarks.
15. Signature of transmitter.

B. Options: Identify options requiring selection by Engineer.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Engineer on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

1.6 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Email: Prepare submittals as PDF package, and transmit to Engineer by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Engineer.

    a. Engineer will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the

Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 7 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 7 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Engineer's consultants, Owner, or other parties is indicated, allow 14 days for initial review of each submittal.

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.

E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

1.7 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
    d. Statement of compliance with specified referenced standards.
    e. Testing by recognized testing agency.
    f. Application of testing agency labels and seals.
    g. Notation of coordination requirements.
    h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

a. Wiring diagrams that show factory-installed wiring.
b. Printed performance curves.
c. Operational range diagrams.
d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Engineer's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Identification of products.
b. Schedules.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings in pdf format, unless otherwise indicated, on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

a. Project name and submittal number.
b. Generic description of Sample.
c. Product name and name of manufacturer.
d. Sample source.
e. Number and title of applicable Specification Section.
f. Specification paragraph number and generic name of each item.

3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return one set with options selected.

D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Engineers and owners, and other information specified.

E. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

F. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

G. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests

performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

1.8 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

    1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Engineer.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

    1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.9 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp with handwritten or digital signature before submitting to Engineer.

B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, signed and approved for compliance with the Contract Documents.

1. Engineer will not review submittals received from Contractor that do not have Contractor's review, signature and approval.

1.10 ENGINEER'S REVIEW

A. Action Submittals: Engineer will review each submittal, indicate corrections or revisions required, and return it.

1. PDF Submittals: Engineer will indicate, via markup on each submittal, the appropriate action.

2. Paper Submittals: Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Engineer will return without review submittals received from sources other than Contractor.

F. Submittals not required by the Contract Documents will be returned by Engineer without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 013516 - ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes special procedures for alteration work.

1.3 DEFINITIONS

A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.

B. Consolidate: To strengthen loose or deteriorated materials in place.

C. Design Reference Sample: A sample that represents the Engineer's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.

D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Engineer.

F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.

K. Retain: To keep existing items that are not to be removed or dismantled.

L. Strip: To remove existing finish down to base material unless otherwise indicated.

1.4 COORDINATION

A. Alteration Work Subschedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.

1. Schedule construction operations in sequence required to obtain best Work results.
2. Coordinate sequence of alteration work activities to accommodate the following:

    a. Owner's continuing occupancy of portions of existing building.
    b. Tests and inspections.

3. Detail sequence of alteration work, with start and end dates.
4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
5. Use of elevator and stairs.
6. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.

B. Pedestrian and Vehicular Circulation: Coordinate alteration work with circulation patterns within Project building(s) and site. Some work is near circulation patterns. Circulation patterns cannot be closed off entirely and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly.

1.5 PROJECT MEETINGS FOR ALTERATION WORK

A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.

1. Attendees: In addition to representatives of Owner, Engineer, and Contractor, testing service representative, specialists, and chemical-cleaner manufacturer(s) shall be represented at the meeting.
2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:

    a. Alteration Work Subschedule: Discuss and finalize; verify availability of materials, specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
    b. Fire-prevention plan.
    c. Governing regulations.

d. Areas where existing construction is to remain and the required protection.
e. Hauling routes.
f. Sequence of alteration work operations.
g. Storage, protection, and accounting for salvaged and specially fabricated items.
h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
i. Qualifications of personnel assigned to alteration work and assigned duties.
j. Requirements for extent and quality of work, tolerances, and required clearances.
k. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.

3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.

B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at weekly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner, Engineer, and Contractor, each specialist, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of alteration work activities shall be represented at these meetings. All participants at conference shall be familiar with Project and authorized to conclude matters relating to alteration work.
2. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of alteration work. Include topics for discussion as appropriate to status of Project.

a. Alteration Work Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
b. Schedule Updating: Revise Contractor's Alteration Work Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
c. Review present and future needs of each entity present, including review items listed in the "Preliminary Conference for Alteration Work" Paragraph in this article and the following:

1) Interface requirements of alteration work with other Project Work.
2) Status of submittals for alteration work.
3) Access to alteration work locations.
4) Effectiveness of fire-prevention plan.
5) Quality and work standards of alteration work.
6) Change Orders for alteration work.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.6 INFORMATIONAL SUBMITTALS

A. Fire-Prevention Plan: Submit 10 days before work begins.

1.7 QUALITY ASSURANCE

A. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.

B. Safety and Health Standard: Comply with ANSI/ASSE A10.6.

1.8 STORAGE AND HANDLING OF SALVAGED MATERIALS

A. Salvaged Materials:

1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area off-site.
5. Protect items from damage during transport and storage.

B. Salvaged Materials for Reinstallation:

1. Repair and clean items for reuse as indicated.
2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Engineer, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.

D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.

1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
2. Secure stored materials to protect from theft.

E. Storage Space:

1. Arrange for off-site locations for storage and protection of salvaged material that cannot be stored and protected on-site.

1.9 FIELD CONDITIONS

A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of preconstruction photographs.

1. Comply with requirements specified in Section 013233 "Photographic Documentation."

B. Discrepancies: Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

C. Size Limitations in Existing Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within existing spaces, areas, rooms, and openings, including temporary protection.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.

1. Use only proven protection methods, appropriate to each area and surface being protected.
2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
3. Erect temporary barriers to form and maintain fire-egress routes.
4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.

8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.

B. Temporary Protection of Materials to Remain:

1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.

C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:

1. Notify Owner, Engineer, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Engineer immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "Owner's Responsibility for Fire Protection."
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.

a. If combustible material cannot be removed, provide fire blankets to cover such materials.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:

1. Obtain Owner's approval for operations involving use of open-flame or welding or other high-heat equipment. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:

    a. Train each fire watch in the proper operation of fire-control equipment and alarms.
    b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
    c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
    d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
    e. Maintain fire-watch personnel at each area of Project site until 60 minutes after conclusion of daily work.

C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.

D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.

1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.

B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.

C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.

E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 GENERAL ALTERATION WORK

A. Have specialty work performed only by qualified specialists.

B. Ensure that supervisory personnel are present when work begins and during its progress.

C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs. Comply with requirements in Section 013233 "Photographic Documentation."

D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.

E. Notify Engineer of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Engineer.

END OF SECTION 013516

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Engineer, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

C. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste-handling procedures.
5. Other dust-control measures.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide galvanized-steel bases for supporting posts.

B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

C. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats minimum 36 by 60 inches.

D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Owner will provide conditioned interior space for field offices for duration of Project.

B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

D. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

E. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

1. Prior to commencing work, isolate the HVAC system in area where work is to be performed.

    a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
    b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.

2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

F. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install WiFi cell phone access equipment and one land-based telephone line(s) for each field office.

1. At each telephone, post a list of important telephone numbers.

a. Police and fire departments.
b. Ambulance service.
c. Contractor's home office.
d. Contractor's emergency after-hours telephone number.
e. Engineers' offices.
f. Owner's office.
g. Principal subcontractors' field and home offices.

3.4 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Maintain support facilities until Engineer schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

E. Project Signs: Provide Project signs. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as required by Owner.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touch up signs so they are legible at all times.

F. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

G. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

H. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life. Use of existing elevators is limited to Contractor personnel and transporting small hand tools. Contractor shall not be permitted to use existing elevators for the transport of materials.

1. Do not load elevators beyond their rated weight capacity.
2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.

I. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

C. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

E. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

F. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and tenants from fumes and noise.

1. Construct dustproof partitions with two layers of 6-mil polyethylene sheet on each side. Cover floor with two layers of 6-mil polyethylene sheet, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.

    a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches between doors. Maintain water-dampened foot mats in vestibule.
2. Insulate partitions to control noise transmission to occupied areas.
3. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
4. Protect air-handling equipment.
5. Provide walk-off mats at each entrance through temporary partition.

G. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved by Engineer through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named

product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications. Submit a comparable product request, if applicable.

1.4 ACTION SUBMITTALS

A. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify basis-of-design product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within seven days of receipt of a comparable product request. Engineer will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Form of Engineer's Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
b. Use product specified if Engineer does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.

B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.

2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:

    a. Name of product and manufacturer.
    b. Model and serial number.
    c. Capacity.
    d. Speed.
    e. Ratings.

3. See individual identification sections in Divisions 21, 23, 26 and 28 for additional identification requirements.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Engineer will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

    a. Submit additional documentation required by Engineer in order to establish equivalency of proposed products. Evaluation of "or equal" product status is by the Engineer, whose determination is final.

B. Product Selection Procedures:

1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole product may be indicated by the phrase: "Subject to compliance with requirements, provide the following: …"

2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole manufacturer/source may be indicated by the phrase: "Subject to compliance with requirements, provide products by the following: …"

3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Limited list of products may be indicated by the phrase: "Subject to compliance with requirements, provide one of the following: …"

4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, which complies with requirements.

    a. Non-limited list of products is indicated by the phrase: "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following: …"

5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, provide products by one of the following: …"

6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, which complies with requirements.

    a. Non-limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following: …"

7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Engineer's sample or match existing conditions," provide a product that complies with requirements and matches Engineer's sample or existing conditions. Engineer's decision will be final on whether a proposed product matches.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products: Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer may return requests without action, except to record noncompliance with these requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
2. Evidence that proposed product provides specified warranty.
3. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners, if requested.
4. Samples, if requested.

B. Submittal Requirements: Approval by the Engineer of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Installation of the Work.
2. Cutting and patching.
3. Progress cleaning.
4. Starting and adjusting.
5. Protection of installed construction.

B. Related Requirements:

1. Section 011000 "Summary" for limits on use of Project site.
2. Section 013300 "Submittal Procedures" for submitting surveys.
3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 PREINSTALLATION MEETINGS

A. Cutting and Patching Conference: Conduct conference at Project site.

1. Prior to commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from

cutting and patching work. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:

a. Contractor's superintendent.
b. Trade supervisor responsible for cutting operations.
c. Trade supervisor(s) responsible for patching of each type of substrate.
d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affecting by cutting and patching operations.

2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.

C. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.

a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

1.6 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Engineer of locations and details of cutting and await directions from Engineer before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Engineer for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services; and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Engineer according to requirements in Section 013100 "Project Management and Coordination."

3.3 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Repair or remove and replace damaged, defective, or nonconforming Work.

1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.4 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
4. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Use containers intended for holding waste materials of type to be stored.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."

B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

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

B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.

C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner’s property.

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

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

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

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

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

1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."

B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

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

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area off-site as designated by Owner.
5. Protect items from damage during transport and storage.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

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

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

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

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

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

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.4 RECYCLING DEMOLITION WASTE

A. Piping: Reduce piping to straight lengths and store by material and size. Separate supports, hangers, valves, sprinklers, and other components by material and size.

B. Conduit: Reduce conduit to straight lengths and store by material and size.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:

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

4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

a. Comply with requirements in Section 329300 "Plants" for use of clean sawdust as organic mulch.

C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

a. Comply with requirements in Section 329300 "Plants" for use of clean ground gypsum board as inorganic soil amendment.

D. Paint: Seal containers and store by type.

3.6 DISPOSAL OF WASTE

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

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner’s property.

C. Burning: Do not burn waste materials.

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:

1. Section 013233 "Photographic Documentation" for submitting final completion construction photographic documentation.
2. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
3. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Section 017900 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of cleaning agent.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at final completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Engineer's signature for receipt of submittals.

5. Submit testing, adjusting, and balancing records.
6. Submit sustainable design submittals not previously submitted.
7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.

2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
6. Advise Owner of changeover in utility services.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements.
10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.
5. Submit final completion photographic documentation.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of

unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Engineer.
    d. Name of Contractor.
    e. Page number.

4. Submit list of incomplete items in the following format:

    a. MS Excel electronic file. Engineer will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

1. Submit on digital media acceptable to Engineer by email to Engineer.

E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural

weathering of exterior surfaces. Restore reflective surfaces to their original condition.

g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
p. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
q. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

D. Construction Waste Disposal: Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory manuals.
2. Emergency manuals.
3. Systems and equipment operation manuals.
4. Systems and equipment maintenance manuals.
5. Product maintenance manuals.

B. Related Requirements:
1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Engineer and Commissioning Authority will comment on whether content of operation and maintenance submittals is acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operation and maintenance manuals in the following format:

1. Submit on digital media acceptable to Engineer by email to Engineer. Enable reviewer comments on draft submittals.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Engineer and Commissioning Authority will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Engineer and Commissioning Authority will return copy with comments.

1. Correct or revise each manual to comply with Engineer's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Engineer's and Commissioning Authority's comments and prior to commencing demonstration and training.

E. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Engineer.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Engineer that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 EMERGENCY MANUALS

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.

4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

E. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

1.8 SYSTEMS AND EQUIPMENT OPERATION MANUALS

A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.9 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

    a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of maintenance manuals.

1.10 PRODUCT MAINTENANCE MANUALS

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

E. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.
4. Miscellaneous record submittals.

B. Related Requirements:

1. Section 017300 "Execution" for final property survey.
2. Section 017700 "Closeout Procedures" for general closeout procedures.
3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of record Drawings as follows:

a. Initial Submittal:

1) Submit PDF electronic files of scanned record prints and one of file prints.
2) Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

b. Final Submittal:

1) Submit record digital data files and three set(s) of record digital data file plots.
2) Plot each drawing file, whether or not changes and additional information were recorded.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

1.4 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Engineer's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Engineer. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
3. Refer instances of uncertainty to Engineer for resolution.
4. Engineer will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.

    a. See Section 013100 "Project Management and Coordination" for requirements related to use of Engineer's digital data files.
    b. Engineer will provide data file layer information. Record markups in separate layers.

C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Engineer.
    e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
5. Note related Change Orders, record Product Data, and record Drawings where applicable.

B. Format: Submit record Specifications as annotated PDF electronic file.

1.6 RECORD PRODUCT DATA

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

C. Format: Submit record Product Data as annotated PDF electronic file.

1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

1.7 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

A. Maintenance of Record Documents: Store record documents in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Engineer's reference during normal working hours.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017839

SECTION 033053 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 312000 "Earth Moving" for drainage fill under slabs-on-grade.
2. Section 321313 "Concrete Paving" for concrete pavement and walks.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Design Mixtures: For each concrete mixture.

1.4 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. Comply with the following sections of ACI 301 unless modified by requirements in the Contract Documents:

1. "General Requirements."
2. "Formwork and Formwork Accessories."
3. "Reinforcement and Reinforcement Supports."
4. "Concrete Mixtures."
5. "Handling, Placing, and Constructing."
6. "Lightweight Concrete."

B. Comply with ACI 117.

2.2 STEEL REINFORCEMENT

A.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

C. Plain-Steel Wire: ASTM A 1064/A 1064M, as drawn.

D. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.

E. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

2.3 CONCRETE MATERIALS

A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C 150/C 150M, Type I/II.
2. Fly Ash: ASTM C 618, Class C or F.

C. Normal-Weight Aggregate: ASTM C 33/C 33M, 1 inch nominal maximum aggregate size.

D. Air-Entraining Admixture: ASTM C 260/C 260M.

E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

F. Water: ASTM C 94/C 94M or potable.

2.4 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

2.6 CONCRETE MIXTURES

A. Comply with ACI 301.

B. Normal-Weight Concrete:

1. Minimum Compressive Strength: 3000 psi (20.7 MPa) at 28 days.
2. Maximum W/C Ratio: 0.50.
3. Cementitious Materials: Use fly ash, pozzolan, as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
4. Slump Limit: Concrete should be workable and fill all corners of the concrete forms while still maintaining proper shape.
5. Air Content: Maintain within range permitted by ACI 301. Do not allow air content of trowel-finished floor slabs to exceed 3 percent.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

A. Design, construct, erect, brace, and maintain formwork according to ACI 301.

3.2 EMBEDDED ITEM INSTALLATION

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 STEEL REINFORCEMENT INSTALLATION

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

3.4 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.

3.5 CONCRETE PLACEMENT

A. Comply with ACI 301 for placing concrete.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

C. Consolidate concrete with mechanical vibrating equipment according to ACI 301.

D. E

3.6 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections exceeding 1/2 inch (13 mm).

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch (3 mm).

1. Apply to concrete surfaces exposed to public view or to receive a rubbed finish.

C. Rubbed Finish: Apply the following rubbed finish, defined in ACI 301, to smooth-formed-finished as-cast concrete where indicated:

1. Smooth-rubbed finish.
2. Grout-cleaned finish.

3. Cork-floated finish.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces 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.

3.7 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.

1. Do not further disturb surfaces before starting finishing operations.

C. Slip-Resistive Broom Finish: Apply a slip-resistive finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.8 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 305.1 (ACI 305.1M) for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

a. Water.
b. Continuous water-fog spray.
c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less

than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.

3.9 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Tests: Perform according to ACI 301.
   1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.

END OF SECTION 033053

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Steel pipe and tube railings.
2. Aluminum pipe and tube railings.
3. Stainless-steel pipe and tube railings.

B. Related Requirements:
1. Section 057300 "Decorative Metal Railings" for ornamental railings fabricated from pipes and tubes.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters, including finish.
2. Fittings and brackets.
3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.

    a. Show method of connecting and finishing members at intersections.

D. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

E. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

F. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Steel Pipe and Tube Railings:

1. VIVA Railings, LLC
2. Wagner, R&B, Inc.

B. Aluminum Pipe and Tube Railings:

1. ART Technologies, Inc.
2. Blum, Julius & Co., Inc.
3. Braun, J.G., Company, The Wagner Companies
4. CraneVeyor Corp
5. Hollaender Manufacturing
6. Kee Industrial Products
7. Moultrie Manufacturing Co.
8. Sterling Dula Architecture
9. Superior Aluminum Products
10. Thompson Fabricating
11. Tri Tech, Inc
12. Tubular Specialties Manufacturers
13. Tuttle Railing Systems
14. Wagner R&B, Inc.

C. Stainless-Steel Pipe and Tube Railings:

1. Blum, Julius & Co., Inc.
2. Paragon Aquatics
3. Stainless Steel Fabricators, Inc.
4. Tri Tech, Inc
5. Tubular Specialties Manufacturer

6. Tuttle Railing Systems

7. VIVA Railings, LLC

8. Wagner R&B, Inc

D. Source Limitations: Obtain each type of railing from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
b. Infill load and other loads need not be assumed to act concurrently.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C),material surfaces.

2.3 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch (38-mm) clearance from inside face of handrail to finished wall surface.

2.4 STEEL AND IRON

A.

B. Tubing: ASTM A 500 (cold formed) or ASTM A 513.

C. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

1. Provide galvanized finish for exterior installations and where indicated.

D. Plates, Shapes, and Bars: ASTM A 36/A 36M.

E. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

2.5 ALUMINUM

A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.

B. Extruded Bars and Tubing: ASTM B 221 (ASTM B 221M), Alloy 6063-T5/T52.

C. Extruded Structural Pipe and Round Tubing: ASTM B 429/B 429M, Alloy 6063-T6.

1. Provide Standard Weight (Schedule 40) pipe unless otherwise indicated.

D. Drawn Seamless Tubing: ASTM B 210 (ASTM B 210M), Alloy 6063-T832.

E. Plate and Sheet: ASTM B 209 (ASTM B 209M), Alloy 6061-T6.

F. Die and Hand Forgings: ASTM B 247 (ASTM B 247M), Alloy 6061-T6.

G. Castings: ASTM B 26/B 26M, Alloy A356.0-T6.

2.6 STAINLESS STEEL

A. Tubing: ASTM A 554, Grade MT 304 or Grade MT 316L.

B. Pipe: ASTM A 312/A 312M, Grade TP 304 or Grade TP 316L.

C. Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20 or Grade CF 8M or CF 3M.

D. Plate and Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304 or Type 316L.

2.7 FASTENERS

A. General: Provide the following:

1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5 for zinc coating.
2. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
3. Aluminum Railings: Type 304 or Type 316 stainless-steel fasteners.

4. Stainless-Steel Railings: Type 304 or Type 316 stainless-steel fasteners.
5. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
3. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

2.8 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For aluminum and stainless-steel railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting"

E. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

F. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

G. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

H. Intermediate Coats and Topcoats: Provide products that comply with Section 099113 "Exterior Painting"

I. Epoxy Intermediate Coat: Complying with MPI #77 and compatible with primer and topcoat.

J. Polyurethane Topcoat: Complying with MPI #72 and compatible with undercoat.

K. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

L. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

M. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: [At exterior locations] [and] [where indicated] provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.9 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings witheither welded or nonwelded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

J. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

K. Form Changes in Direction as Follows:

1. As detailed.

L. Close exposed ends of railing members with prefabricated end fittings.

M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

P. For railing posts set in concrete, provide stainless-steel sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with metal plate forming bottom closure.

Q. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.10 STEEL AND IRON FINISHES

A. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

B. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

C. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, galvanize anchors to be embedded in exterior concrete or masonry.

D. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning." or SSPC-SP 3, "Power Tool Cleaning." or requirements indicated below:]

1. Exterior Railings: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Railings Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Railings Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Railings: SSPC-SP 3, "Power Tool Cleaning."

E. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Shop prime uncoated railings with universal shop primer.
2. Do not apply primer to galvanized surfaces.

F. Shop-Painted Finish: Comply with Section 099113 "Exterior Painting."

1. Color: As selected by the Owner.

2.11 ALUMINUM FINISHES

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Mill Finish: AA-M12, nonspecular as fabricated.

C. Clear Anodic Finish: AAMA 611,.

D. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Color and Gloss: As selected by the Owner.

2.12 STAINLESS-STEEL FINISHES

A. Remove tool and die marks and stretch lines, or blend into finish.

B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches.

C. Stainless Steel Tubing Finishes:

1. 180-Grit Polished Finish: Uniform, directionally textured finish.
2. 320-Grit Polished Finish: Oil-ground, uniform, fine, directionally textured finish.
3. Polished and Buffed Finish: 320-grit finish followed by buffing to a high luster finish.

D. Stainless Steel Sheet and Plate Finishes:

1. Directional Satin Finish: ASTM A 489/A 480, No. 4.
2. High Luster Finish: ASTM A 480/A 480M, No. 7.
3. Mirror Finish: ASTM A 480/A 480M, No. 8.

E. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (6 mm in 3.5 m).

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches (50 mm) beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches (150 mm) of post.

3.4 ANCHORING POSTS

A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material or attached to post with set screws.

D. Leave anchorage joint exposed with 1/8-inch (3-mm) buildup, sloped away from post.

E. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

1. For aluminum pipe railings, attach posts using fittings designed and engineered for this purpose.

2. For stainless-steel pipe railings, weld flanges to post and bolt to supporting surfaces.
3. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

F. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.5 ATTACHING RAILINGS

A. Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends or connected to railing ends using nonwelded connections.

B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends or connected to railing ends using nonwelded connections.

3.6 ADJUSTING AND CLEANING

A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055213

SECTION 221313 - FACILITY SANITARY SEWERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. ABS pipe and fittings.
2. PVC pipe and fittings.
3. Nonpressure-type transition couplings.
4. Expansion joints and deflection fittings.
5. Backwater valves.
6. Cleanouts.
7. Encasement for piping.
8. Manholes.
9. Concrete.

1.3 DEFINITIONS

A. FRP: Fiberglass-reinforced plastic.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Pipe and fittings.
2. Non-pressure and pressure couplings
3. Expansion joints and deflection fittings.
4. Backwater valves.
5. Cleanouts.

B. Shop Drawings: For manholes. Include plans, elevations, sections, details, and frames and covers.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings:

1. Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from sewer system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.
2. Show system piping in profile. Draw profiles to horizontal scale of not less than 1 inch equals 50 feet (1:500) and to vertical scale of not less than 1 inch equals 5 feet (1:50). Indicate manholes and piping. Show types, sizes, materials, and elevations of other utilities crossing system piping.

B. Product Certificates: For each type of pipe and fitting.

C. Field quality-control reports.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic manholes, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle manholes according to manufacturer's written rigging instructions.

1.7 FIELD CONDITIONS

A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Engineer and Owner no fewer than three days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Owner’s written permission.

PART 2 - PRODUCTS

2.1 ABS PIPE AND FITTINGS

A. ABS Sewer Pipe and Fittings: ASTM D 2661, with bell-and-spigot ends for gasketed joints.

1. NPS 3 to NPS 6 (DN 80 to DN 150): SDR 35.
2. NPS 8 to NPS 12 (DN 200 to DN 300): SDR 42.

B. Gaskets: ASTM F 477, elastomeric seals.

2.2 PVC PIPE AND FITTINGS

A. PVC Cellular-Core Sewer Piping:

1. Pipe: ASTM F 891, Sewer and Drain Series, PS 50 minimum stiffness, PVC cellular-core pipe with plain ends for solvent-cemented joints.

2. Fittings: ASTM D 3034, SDR 35, PVC socket-type fittings.

B. PVC Corrugated Sewer Piping:

1. Pipe: ASTM F 949, PVC corrugated pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM F 949, PVC molded or fabricated, socket type.
3. Gaskets: ASTM F 477, elastomeric seals.

C. PVC Profile Sewer Piping:

1. Pipe: ASTM F 794, PVC profile, gravity sewer pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM D 3034, PVC with bell ends.
3. Gaskets: ASTM F 477, elastomeric seals.

D. PVC Type PSM Sewer Piping:

1. Pipe: ASTM D 3034, SDR 35, PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM D 3034, PVC with bell ends.
3. Gaskets: ASTM F 477, elastomeric seals.

E. PVC Gravity Sewer Piping:

1. Pipe and Fittings: ASTM F 679, T-2 wall thickness, PVC gravity sewer pipe with bell-and-spigot ends and with integral ASTM F 477, elastomeric seals for gasketed joints.

2.3 NONPRESSURE-TYPE TRANSITION COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling; for joining underground nonpressure piping. Include ends of same sizes as piping to be joined and include corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:
1. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
2. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

C. Unshielded, Flexible Couplings:

1. Description: Elastomeric sleeve with[**stainless-steel shear ring and**] corrosion-resistant-metal tension band and tightening mechanism on each end.
2. <Double click here to find, evaluate, and insert list of manufacturers and products.>

D. Shielded, Flexible Couplings:

1. Description: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
2. <Double click here to find, evaluate, and insert list of manufacturers and products.>

E. Ring-Type, Flexible Couplings:

1. Description: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.
2. <Double click here to find, evaluate, and insert list of manufacturers and products.>

F. Nonpressure-Type, Rigid Couplings:

1. Description: ASTM C 1461, sleeve-type, reducing- or transition-type mechanical coupling; molded from ASTM C 1440, TPE material; with corrosion-resistant-metal tension band and tightening mechanism on each end.
2. <Double click here to find, evaluate, and insert list of manufacturers and products.>

2.4 BACKWATER VALVES

A. PVC Backwater Valves:

1. Description: Horizontal type; with PVC body, PVC removable cover, and PVC swing check valve.
2. <Double click here to find, evaluate, and insert list of manufacturers and products.>

2.5 CLEANOUTS

A. PVC Cleanouts:

1. Description: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.
2. <Double click here to find, evaluate, and insert list of manufacturers and products.>

2.6 ENCASEMENT FOR PIPING

A. Standard: ASTM A 674 or AWWA C105/A21.5.

B. Material: [**Linear low-density polyethylene film of 0.008-inch (0.20-mm)**] [**or**] [**high-density, cross-laminated polyethylene film of 0.004-inch (0.10-mm)**] minimum thickness.

C. Form: [**Sheet**] [**or**] [**tube**].

D. Color: [**Black**] [**or**] [**natural**] <**Insert color**>.

2.7 MANHOLES

A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478 (ASTM C 478M), precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches (1200 mm) minimum unless otherwise indicated.

3. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
4. Base Section: 6-inch (150-mm) minimum thickness for floor slab and 4-inch (100-mm) minimum thickness for walls and base riser section; with separate base slab or base section with integral floor.
5. Riser Sections: 4-inch (100-mm) minimum thickness, of length to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type as indicated; with top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990 (ASTM C 990M), bitumen or butyl rubber.
8. Resilient Pipe Connectors: ASTM C 923 (ASTM C 923M), cast or fitted into manhole walls, for each pipe connection.
9. Steps: Individual FRP steps, FRP ladder, or ASTM A 615/A 615M, deformed, 1/2-inch (13-mm) steel reinforcing rods encased in ASTM D 4101, PP; wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch (300- to 400-mm) intervals. Omit steps if total depth from floor of manhole to finished grade is less than 48 inches .
10. Adjusting Rings: Interlocking HDPE rings, with level or sloped edge in thickness and diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope. Include sealant recommended by ring manufacturer.
11. Grade Rings: Reinforced-concrete rings, 6- to 9-inch (150- to 225-mm) total thickness, with diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope.

B. Manhole Frames and Covers:

1. Description: Ferrous; 24-inch (610-mm) ID by 7- to 9-inch (175- to 225-mm) riser, with 4-inch- (100-mm-) minimum-width flange and 26-inch- (660-mm-) diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "SANITARY SEWER."
2. Material: ASTM A 536, Grade 60-40-18 ductileiron unless otherwise indicated.

C. Manhole-Cover Inserts:

1. Description; Manufactured, plastic form, of size to fit between manhole frame and cover and designed to prevent stormwater inflow. Include handle for removal and gasket for gastight sealing.
2.
3. Type: Solid

2.8 CONCRETE

A. General: Cast-in-place concrete complying with ACI 318, ACI 350 (ACI 350M), and the following:

1. Cement: ASTM C 150/C 150M, Type II.
2. Fine Aggregate: ASTM C 33/C 33M, sand.
3. Coarse Aggregate: ASTM C 33/C 33M, crushed gravel.

4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi (27.6 MPa) minimum, with 0.45 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A 1064/A 1064M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420-MPa) deformed steel.

C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi (27.6 MPa) minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.

1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.

a. Invert Slope: 1 percent through manhole.

2. Benches: Concrete, sloped to drain into channel.

a. Slope: 4 percent.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi (20.7 MPa) minimum, with 0.58 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A1064/A 1064M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420-MPa) deformed steel.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details to indicate general location and arrangement of underground sanitary sewer piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.

F. Install gravity-flow, nonpressure, drainage piping according to the following:

1. Install piping pitched down in direction of flow, at minimum slope of 1 percent unless otherwise indicated.
2. Install piping NPS 6 (DN 150) and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place-concrete supports or anchors.
3. Install piping with 48-inch (1220-mm) minimum cover.
4. Install ABS sewer piping according to ASTM D 2321 and ASTM F 1668.
5. Install PVC cellular-core sewer piping according to ASTM D 2321 and ASTM F 1668.
6. Install PVC corrugated sewer piping according to ASTM D 2321 and ASTM F 1668.
7. Install PVC profile sewer piping according to ASTM D 2321 and ASTM F 1668.
8. Install PVC Type PSM sewer piping according to ASTM D 2321 and ASTM F 1668.
9. Install PVC gravity sewer piping according to ASTM D 2321 and ASTM F 1668.

G. Install corrosion-protection piping encasement over the following underground metal piping according to ASTM A 674 or AWWA C105/A21.5:

1. Hub-and-spigot, cast-iron soil pipe.
2. Hubless cast-iron soil pipe and fittings.
3. Ductile-iron pipe and fittings.
4. Expansion joints and deflection fittings.

H. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

3.3 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure, drainage piping according to the following:

1. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
2. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead and oakum calked joints.
3. Join hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.
4. Join ductile-iron, gravity sewer piping according to AWWA C600 for push-on joints.
5. Join ABS sewer piping according to ASTM D 2321 for elastomeric-seal joints.
6. Join PVC cellular-core sewer piping according to ASTM D 2321 and ASTM F 891 for solvent-cemented joints.
7. Join PVC corrugated sewer piping according to ASTM D 2321.
8. Join PVC profile sewer piping according to ASTM D 2321 for elastomeric-seal joints or ASTM F 794 for gasketed joints.

9. Join PVC Type PSM sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.
10. Join PVC gravity sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.
11. Join fiberglass sewer piping according to ASTM D 4161 for elastomeric-seal joints.
12. Join nonreinforced-concrete sewer piping according to ASTM C 14 (ASTM C 14M) and ACPA's "Concrete Pipe Installation Manual" for rubber-gasket joints.
13. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasket joints.
14. Join dissimilar pipe materials with nonpressure-type, flexible[**or rigid**] couplings.

B. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

1. Use nonpressure flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.

    a. Shielded flexible or rigidcouplings for pipes of same or slightly different OD.
    b. Unshielded, increaser/reducer-pattern, flexible or rigidcouplings for pipes with different OD.
    c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

2. Use pressure pipe couplings for force-main joints.

3.4 MANHOLE INSTALLATION

A. General: Install manholes complete with appurtenances and accessories indicated.

B. Install precast concrete manhole sections with sealants according to ASTM C 891.

C. Install FRP manholes according to manufacturer's written instructions.

D. Form continuous concrete channels and benches between inlets and outlet.

E. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches (76 mm) above finished surface elsewhere unless otherwise indicated.

F. Install manhole-cover inserts in frame and immediately below cover.

3.5 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318.

3.6 BACKWATER VALVE INSTALLATION

A. Install horizontal-type backwater valves in piping manholes or pits.

B. Install combination horizontal and manual gate-type valves in piping and in manholes.

C. Install terminal-type backwater valves on end of piping and in manholes. Secure units to sidewalls.

3.7 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts, and use cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Use Light-Duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
2. Use Medium-Duty, top-loading classification cleanouts in paved foot-traffic areas.
3. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic serviceareas.
4. Use Extra-Heavy-Duty, top-loading classification cleanouts in [**roads**] <**Insert area**>.

B. Set cleanout frames and covers in earth in cast-in-place-concrete block, 18 by 18 by 12 inches (450 by 450 by 300 mm) deep. Set with tops 1 inch (25 mm) above surrounding grade.

C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

3.8 CONNECTIONS

A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains specified in Section 221316 "Sanitary Waste and Vent Piping."

B. Connect force-main piping to building's sanitary force mains specified in Section 221316 "Sanitary Waste and Vent Piping." Terminate piping where indicated.

C. Make connections to existing piping and underground manholes.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch (150-mm) overlap with not less than 6 inches (150 mm) of concrete with 28-day compressive strength of 3000 psi (20.7 MPa).
2. Make branch connections from side into existing piping, NPS 4 to NPS 20 (DN 100 to DN 500). Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches (150 mm) of concrete with 28-day compressive strength of 3000 psi (20.7 MPa).
3. Make branch connections from side into existing piping, NPS 21 (DN 525) or larger, or to underground manholes by cutting opening into existing unit large enough to allow 3 inches (76 mm) of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of, and be flush with, inside wall unless otherwise indicated. On outside of pipe or manhole wall, encase entering connection in 6 inches (150 mm) of concrete for minimum length of 12 inches (300 mm) to provide additional support of collar from connection to undisturbed ground.

a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi (20.7 MPa) unless otherwise indicated.
b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.

4. Protect existing piping and manholes to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

D. Connect to [**grease**] [**oil**] [**and**] [**sand**] interceptors specified in Section 221323 "Sanitary Waste Interceptors."

3.9 CLOSING ABANDONED SANITARY SEWER SYSTEMS

A. Abandoned Piping: Remove abandoned piping.

B. Abandoned Manholes: Excavate around manhole as required and use either procedure below:

1. Remove manhole and close open ends of remaining piping.
2. Remove top of manhole down to at least 36 inches (915 mm) below final grade. Fill to within 12 inches (300 mm) of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.

C. Backfill to grade according to Section 312000 "Earth Moving."

3.10 IDENTIFICATION

A. Comply with requirements in Section 312000 "Earth Moving" for underground utility identification devices. Arrange for installation of green warning tapes directly over piping and at outside edges of underground manholes.

1. Use warning tape or detectable warning tape over ferrous piping.
2. Use detectable warning tape over nonferrous piping and over edges of underground manholes.

3.11 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (600 mm) of backfill is in place, and again at completion of Project.

1. Submit separate report for each system inspection.
2. Defects requiring correction include the following:

a. Alignment: Less than full diameter of inside of pipe is visible between structures.
b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
c. Damage: Crushed, broken, cracked, or otherwise damaged piping.

d. Infiltration: Water leakage into piping.
e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Hydrostatic Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction and the following:

a. Fill sewer piping with water. Test with pressure of at least 10-foot (3-m) head of water, and maintain such pressure without leakage for at least 15 minutes.
b. Close openings in system and fill with water.
c. Purge air and refill with water.
d. Disconnect water supply.
e. Test and inspect joints for leaks.

6. Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

a. Test plastic gravity sewer piping according to ASTM F 1417.
b. Test concrete gravity sewer piping according toASTM C 1628.

7. Force Main: Perform hydrostatic test after thrust blocks, supports, and anchors have hardened. Test at pressure not less than 1-1/2 times the maximum system operating pressure, but not less than [**150 psig (1035 kPa)**] <**Insert value**>.

a. Ductile-Iron Piping: Test according to AWWA C600, "Hydraulic Testing" Section.
b. PVC Piping: Test according to AWWA M23, "Testing and Maintenance" Chapter.

8. Manholes: Perform hydraulic test according to ASTM C 969 (ASTM C 969M).

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.12 CLEANING

A. Clean dirt and superfluous material from interior of piping. Flush with potable water**.**

END OF SECTION 221313

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for **walks, pavements**, **turf and grasses and plants**.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Subbase course for concrete [**walks**] [**pavements**].
6. Subbase course[**and base course**] for asphalt paving.
7. Subsurface drainage backfill for walls and trenches.
8. Excavating and backfilling trenches for utilities and pits for buried utility structures.
9. Excavating well hole to accommodate elevator-cylinder assembly.

B. Related Requirements:

1. [**Section 013200 "Construction Progress Documentation"**] [**Section 013233 "Photographic Documentation"**] for recording preexcavation and earth-moving progress.
2. Section 033000 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
3. Section 311000 "Site Clearing" for site stripping, grubbing, stripping topsoil, and removal of above- and below-grade improvements and utilities.
4.
5. Section 329200 "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
6. Section 329300 "Plants" for finish grading in planting areas and tree and shrub pit excavation and planting.

1.3 UNIT PRICES

A. Work of this Section is affected by unit prices for earth moving specified in Section 012200 "Unit Prices."

B. Quantity allowances for earth moving are included in Section 012100 "Allowances."

1.4 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for **unit prices**.
2. Bulk Excavation: Excavation more than **10 feet (3 m)** in width and more than **30 feet (9 m)** in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed **1 cu. yd. (0.76 cu. m)** for bulk excavation or **3/4 cu. yd. (0.57 cu. m)** for footing, trench, and pit excavation that cannot be removed by rock-excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Equipment for Footing, Trench, and Pit Excavation: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- (1065-mm-) maximum-width, short-tip-radius rock bucket; rated at not less than 138-hp (103-kW) flywheel power with bucket-curling force of not less than 28,700 lbf (128 kN) and stick-crowd force of not less than 18,400 lbf (82 kN) with extra-long reach boom.
2. Equipment for Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp (172-kW) flywheel power and developing a minimum of 47,992-lbf (213.3-kN) breakout force with a general-purpose bare bucket.

I. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material **3/4 cu. yd. (0.57 cu. m)**or more in volume that exceed a standard penetration

resistance of **100 blows/2 inches (97 blows/50 mm)** when tested by a geotechnical testing agency, according to ASTM D 1586.

J. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

K. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

L. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

M. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct preexcavation conference at **Project site**.

1. Review methods and procedures related to earthmoving, including, but not limited to, the following:

a. Personnel and equipment needed to make progress and avoid delays.
b. Coordination of Work with utility locator service.
c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
d. Extent of trenching by hand or with air spade.
e. Field quality control.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:
1. Controlled low-strength material, including design mixture.
2. Geofoam.
3. Warning tapes.

B. Samples for Verification: For the following products, in sizes indicated below:
1. Warning Tape: 12 inches (300 mm) long; of each color.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each **on-site and borrow** soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to **ASTM D 1557**.

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.8 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.9 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify **utility locator service** for area where Project is located before beginning earth-moving operations.

C. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures are in place.

D. Do not commence earth-moving operations until plant-protection measures are in place.

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification **Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487 Groups A-1, A-2-4, A-2-5, and A-3 according to AASHTO M 145**, or a combination of these groups; free of rock or gravel larger than **3 inches (75 mm)** in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

1. Liquid Limit: <**Insert value**>.
2. Plasticity Index: Less than 20.

C. Unsatisfactory Soils: Soil Classification **Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145**, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 294/D 2940M 0; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

H. Drainage Course: Narrowly graded mixture of [**washed**]crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and zero to 5 percent passing a No. 8 (2.36-mm) sieve.

I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and zero to 5 percent passing a No. 4 (4.75-mm) sieve.

J. Sand: ASTM C 33/C 33M; fine aggregate.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 GEOFOAM

2.3 Extruded-Geopolymer:**, 4-lb/cu. ft. density, 30-psi (173-kPa) compressive strength**ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Engineer. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.

a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: **12 inches (300 mm) each side of pipe or conduit**.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches (150 mm) in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
4. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

E. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.7 EXCAVATION FOR ELEVATOR CYLINDER

A. Drill well hole plumb in elevator pit to accommodate installation of elevator-cylinder assembly. Coordinate with applicable requirements for diameter and tolerances in [**Section 142400 "Hydraulic Elevators."**] [**Section 142413 "Hydraulic Freight Elevators."**]

B. Provide well casing as necessary to retain walls of well hole.

3.8 SUBGRADE INSPECTION

A. Notify Engineer when excavations have reached required subgrade.

B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade [**below the building slabs and pavements**] <**Insert locations**> with a pneumatic-tired [**and loaded 10-wheel, tandem-axle dump truck weighing not less than 15**

tons (13.6 tonnes)] <**Insert requirement**> to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction[**, repeating proof-rolling in direction perpendicular to first direction**]. Limit vehicle speed to 3 mph (5 km/h).
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for [**unit prices**] [**changes in the Work**].

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Engineer.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Engineer.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within **18 inches (450 mm)** of bottom of footings with satisfactory soil; fill with geofoam.

D. Trenches under Roadways: Provide **4-inch- (100-mm-)** thick, concrete-base slab support for piping or conduit less than **30 inches (750 mm)** below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of **4 inches (100 mm)** of concrete before backfilling or placing roadway subbase course. Concrete is specified in **Section 033000 "Cast-in-Place Concrete."**] [**Section 033053 "Miscellaneous Cast-in-Place Concrete."**

E. Backfill voids with satisfactory soil while removing shoring and bracing.

F. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of **satisfactory soi**], free of particles larger than **1 inch (25 mm)** in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.

    a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

2. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches (300 mm) over the pipe or conduit. Coordinate backfilling with utilities testing.

G. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
2. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.

H. Warning Tape: Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.13 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than **8 inches (200 mm)** in loose depth for material compacted by heavy compaction equipment and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to [**ASTM D 698**] [**ASTM D 1557**]:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at **95** percent.
2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at **92** percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at **85**percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at **85** percent.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.

2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus **1 inch (25 mm**.
2. Walks: Plus or minus **1 inch (25 mm)**.
3. Pavements: Plus or minus **1/2 inch (13 mm)**.

3.17 SUBSURFACE DRAINAGE

A. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch (150-mm) course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches (300 mm) of filter material, placed in compacted layers 6 inches (150 mm) thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).

1. Compact each filter material layer [**to 85 percent of maximum dry unit weight according to ASTM D 698**] [**with a minimum of two passes of a plate-type vibratory compactor**].

B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches (300 mm) of final subgrade, in compacted layers 6 inches (150 mm) thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).

1. Compact each filter material layer [**to 85 percent of maximum dry unit weight according to ASTM D 698**] [**with a minimum of two passes of a plate-type vibratory compactor**].
2. Place and compact impervious fill over drainage backfill in 6-inch- (150-mm-) thick compacted layers to final subgrade.

3.18 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course[**and base course**] on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course[**and base course**] under pavements and walks as follows:

1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place base course material over subbase course under hot-mix asphalt pavement.
3. Shape subbase course[**and base course**] to required crown elevations and cross-slope grades.
4. Place subbase course[**and base course**] 6 inches (150 mm) or less in compacted thickness in a single layer.

5. Place subbase course[**and base course**] that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
6. Compact subbase course[**and base course**] at optimum moisture content to required grades, lines, cross sections, and thickness to not less than [**95**] <**Insert number**> percent of maximum dry unit weight according to [**ASTM D 698**] [**ASTM D 1557**].

C. Pavement Shoulders: Place shoulders along edges of subbase course[**and base course**] to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase[**and base**] layer to not less than [**95**] <**Insert number**> percent of maximum dry unit weight according to [**ASTM D 698**] [**ASTM D 1557**].

3.19 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
3. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
4. Compact each layer of drainage course to required cross sections and thicknesses to not less than [**95**] <**Insert number**> percent of maximum dry unit weight according to ASTM D 698.

3.20 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material classification and maximum lift thickness comply with requirements.
3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
4. <**Insert special inspections**>.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every [**2000 sq. ft. (186 sq. m)**] <**Insert area**> or less of paved area or building slab but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every [**100 feet (30 m)**] <**Insert dimension**> or less of wall length but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every [**150 feet (46 m)**] <**Insert dimension**> or less of trench length but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.21 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Engineer.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Hot-mix asphalt patching.

B. Related Requirements:
   1. Section 312000 "Earth Moving" for subgrade preparation, fill material, separation geotextiles, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
   2. Section 321313 "Concrete Paving" for concrete pavement and for separate concrete curbs, gutters, and driveway aprons.
   3. Section 321373 "Concrete Paving Joint Sealants" for joint sealants and fillers at pavement terminations.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

   1. Include technical data and tested physical and performance properties.
   2. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
   3. Job-Mix Designs: For each job mix proposed for the Work.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and testing agency.

B. Material Certificates: For each paving material. Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located.

B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements **TxDOT** for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
2. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
4. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
5. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692/D 692M, sound; angular crushed stone, crushed gravel..

C. Fine Aggregate: AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO M 320 binder designation PG 70-22.

B. Asphalt Cement: ASTM D 3381/D 3381M for viscosity-graded material ASTM D 946/D 946M for penetration-graded material.

C. Emulsified Asphalt Prime Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397/D 2397M or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

D. Tack Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397/D 2397M or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

E. Water: Potable.

F. Undersealing Asphalt: ASTM D 3141/D 3141M; pumping consistency.

2.3 AUXILIARY MATERIALS

A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires asphalt shingles or glass from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.

2.4 MIXES

A. Surface Course Limit: Recycled content no more than 10 percent by weight.

B. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes designed according to procedures in AI MS-2, "Asphalt Mix Design Methods"**;** and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction**,** repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).

2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.

3.3 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches (300 mm) into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

C. Placing Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.4 SURFACE PREPARATION

A. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

B. Cutback Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. (0.7 to 2.3 L/sq. m). Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

C. Emulsified Asphalt Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.10 to 0.30 gal./sq. yd. per inch depth (0.5 to 1.40 L/sq. m per 25 mm depth). Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

3.5 PLACING HOT-MIX ASPHALT

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
2. Spread mix at a minimum temperature of 250 deg F (121 deg C).
3. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.6 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
4. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
5. Compact asphalt at joints to a density within 2 percent of specified course density.

3.7 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 96 percent of reference laboratory density according to AASHTO T 245, but not less than 94 percent or greater than 100 percent.

SCHEDULE 1 - Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041/D 2041M, but not less than 90 percent or greater than 96 percent.

A. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

B. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

C. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

D. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

E. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.2 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch (13 mm).
2. Surface Course: Plus 1/4 inch (6 mm), no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:

3.3 FIELD QUALITY CONTROL

A. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549/D 3549M.

B. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

C. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to AASHTO T 168.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared

according to ASTM D 2041/D 2041M, and compacted according to job-mix specifications.

2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726/D 2726M.

    a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than three cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726/D 2726M.

D. Replace and compact hot-mix asphalt where core tests were taken.

E. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.4 WASTE HANDLING

A. General: Handle asphalt-paving waste according to approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 321216

SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes Concrete Paving Including the Following:
   1. Curbs and gutters.
   2. Walks.

B. Related Requirements:

   1. Section 033000 "Cast-in-Place Concrete" for general building applications of concrete.
   2. Section 321373 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

   1. Review methods and procedures related to concrete paving, including but not limited to, the following:

      a. Concrete mixture design.
      b. Quality control of concrete materials and concrete paving construction practices.
      c. .

   2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:

      a. Contractor's superintendent.
      b. Independent testing agency responsible for concrete design mixtures.
      c. Ready-mix concrete manufacturer.

d. Concrete paving Subcontractor.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each type of product or exposed finish, prepared as Samples of size indicated below:

1. Exposed Aggregate: 10-lb (4.5-kg) Sample of each mix.

C. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Bonding agent or epoxy adhesive.
8. Joint fillers.

C. Material Test Reports: For each of the following:

1. Aggregates: Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

D. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

1.8 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 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.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

C. Hot-Weather Concrete Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms[, steel reinforcement,] and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (30.5 m) or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, fabricated from galvanized-steel wire into flat sheets.

B. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

D. Galvanized Reinforcing Bars: ASTM A 767/A 767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A 615/A 615M, Grade 60 (Grade 420) deformed bars.

E. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60 (Grade 420) deformed bars; assembled with clips.

F. Plain-Steel Wire: ASTM A 1064/A 1064M, galvanized.

G. Deformed-Steel Wire: ASTM A 1064/A 1064M.

H. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars Cut bars true to length with ends square and free of burrs.

I. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

J. Hook Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

K. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

L. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

M. Zinc Repair Material: ASTM A 780/A 780M.

2.4 CONCRETE MATERIALS

A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150/C 150M, gray portland cement Type I/II.
2. Fly Ash: ASTM C 618, Class C or Class F.
3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
4. Blended Hydraulic Cement: ASTM C 595/C 595M, [Type IS, portland blast-furnace slag] [Type IP, portland-pozzolan] [Type IL, Portland-limestone] [Type IT, ternary blended] cement.

B. Normal-Weight Aggregates: ASTM C 33/C 33M, [Class 4S] [Class 4M] [Class 1N] <Insert class>, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Exposed Aggregate: Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source, with gap-graded coarse aggregate as follows:

1. Aggregate Sizes: 3/4 to 1 inch (19 to 25 mm) nominal.

D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

E. Water: Potable and complying with ASTM C 94/C 94M.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry or cotton mats.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

2.6 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy-Bonding Adhesive: ASTM C 881/C 881M, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:

1. [Types I and II, nonload bearing] [Types IV and V, load bearing], for bonding hardened or freshly mixed concrete to hardened concrete.

2.7 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Pozzolan: 25 percent.
2. Slag Cement: 50 percent.
3. Combined Fly Ash or Pozzolan, and Slag Cement: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture, high-range, water-reducing and retarding admixture, or plasticizing and retarding admixture in concrete as required for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

E. Concrete Mixtures: Normal-weight concrete.

1. Compressive Strength (28 Days): 3000 psi (20.7 MPa).
2. Maximum W/C Ratio at Point of Placement: 0.50.

3. Slump Limit: Concrete should be workable and fill all corners of the concrete forms while still maintaining proper shape..

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M[and ASTM C 1116/C 1116M]. Furnish batch certificates for each batch discharged and used in the Work.

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

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For concrete batches of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For concrete batches larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph (5 km/h).
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch (13 mm) according to requirements in Section 312000 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded-wire reinforcement in lengths as long 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.

E. Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.

F. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.

G. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch (50-mm) overlap of adjacent mats.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.

2. Provide tie bars at sides of paving strips where indicated.
3. Butt Joints: Use bonding agentat joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of50 feet (15.25 m) unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, to match jointing of existing adjacent concrete paving:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch (6-mm) radius. Repeat grooving of contraction joints after applying surface finishes.

    a. Tolerance: Ensure that grooved joints are within 3 inches (75 mm) either way from centers of dowels.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

    a. Tolerance: Ensure that sawed joints are within 3 inches (75 mm) either way from centers of dowels.

3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 (ACI 301M) by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement dowels and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven

floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch (1.6 to 3 mm) deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing moisture-retaining-cover curing or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period, using cover material and waterproof tape.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 (ACI 117M) and as follows:

1. Elevation: 3/4 inch (19 mm).

2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
3. Surface: Gap below 10-feet- (3-m-) long; unleveled straightedge not to exceed 1/2 inch (13 mm).
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches (13 mm per 300 mm) of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch (25 mm).
6. Vertical Alignment of Dowels: 1/4 inch (6 mm).
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches (6 mm per 300 mm) of dowel.
8. Joint Spacing: 3 inches (75 mm).
9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
10. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231/C 231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F (27 deg C) and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).

D. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project

identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.11 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

PART 1 - GENERAL

1.1 INTRODUCTION:

A. Flowable fill refers to a cementitious slurry consisting of a mixture of fine aggregate or filler, water, and cementitious material(s), which is used as a fill or backfill in lieu of compacted earth. This mixture is capable of filling all voids in irregular excavations and hard to reach places (such as under undercuts of existing slabs), is self-leveling, and hardens in a matter of a few hours without the need for compaction in layers. Flowable fill is sometimes referred to as controlled density fill (CDF), controlled low strength material (CLSM), lean concrete slurry, and unshrinkable fill.

B. Flowable fill materials will be used as only as a structural fill replacement. Unless otherwise noted, flowable fill installed as a substitution for structural earth fill, shall not be designed to be removed by the use of hand tools. The materials and mix design for the flowable fill should be designed to produce the compressive strength indicated for the placed location, as determined by the Engineer of Record.

1.2 DESCRIPTION:

Furnish and place flowable fill in a fluid condition, that sets within the required time and, after curing, obtains the desired strength properties as evidenced by the laboratory testing of the specific mix design, at locations shown on the plans or as directed by the Engineer of Record, in writing. This section specifies flowable fill for use as structural fill to remain easily excavatable using a backhoe as would be utilized for adjoining earth.

1.3 RELATED WORK:

A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES.

B. Earthwork, excavation and backfill and compaction requirements: Section 31 20 00, EARTH MOVING.

1.4 DEFINITIONS:

A. Excavatable Flowable fill – flowable fill designed with a compressive strength that will allow excavation as either machine tool excavatable at compressive strength of 1.5 MPa (200 psi) maximum at 2, or hand tool excavatable at compressive strength of 0.7 MPa (100 psi) maximum at 1 year.

1.5 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Flowable fill Mix Design: Provide flowable fill mix design containing cement and water. At the contractor's option, it may also contain fly ash, aggregate, or chemical admixtures in any proportions such that the final product meets the strength and flow consistency, and shrinkage requirements included in this specifications. The mix design should state the sources and proportions of each of the flowable fill constituents. The coefficient of permeability of flowable fill shall be that of uniform fine sand, 4.0 X 10-1 cm/sec (0.16 in/sec) or as indicated to provide a backfill material with permeability equal to or greater than that of the surrounding soil.

1. Test and Performance - Submit the following data:

a. Flowable fill shall have a minimum strength of 100 psi and a maximum of 200 psi according to ASTM C 39 at 28 days after placement.
b. Flowable fill shall have minimal subsidence and bleed water shrinkage. Evaporation of bleed water shall not result in shrinkage of more than 1/8 inch per ft. of flowable fill depth (for mixes containing high fly ash content). Measurement of a Final Bleeding shall be as measured in Section 10 of ASTM C 940 “Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory.
c. Flowable fill shall have a unit weight of 20 – 115 lb/ft^3) measured at the point of placement after a 60 minute ready-mix truck ride.
d. Provide documentation that the admixture supplier has experience of at least one year, with the products being provided and any equipment required to obtain desired performance of the product.
e. Manufacturer's Certificates: Provide Engineer of Record with a certification that the materials incorporated in the flowable fill, following achievement of the required strength, do not represent a threat to groundwater quality.

1.6 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
B. American Society for Testing and Materials (ASTM):

D4832-10	Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
C618-12	Standard Specifications for Coal Fly Ash and Raw or Calcined Natural Pozzolan for use in Concrete. (Use Fly Ash conforming to the chemical and physical requirements for mineral admixture, Class F listed, including Table 2 (except for Footnote A). Waive the loss on ignition requirement.)
C403/C403M-08	Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.
C150/C150M-11	Standard Specification for Portland Cement
C33/C33M-11a	Standard Specification for Concrete Aggregates
C94/C94M-12	Standard Specification for Ready-Mixed Concrete
C494/C494M-11	Standard Specification for Chemical Admixtures for Concrete
C685/C685M-11	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
C940-10a	Standard Specification for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced – Aggregate Concrete in the Laboratory
D5971	Sampling Freshly Mixed Controlled Low Strength Material
D6103	Flow Consistency of Controlled Low Strength Material
D6023	Unit Weight, Yield, Cement Content and Air Content (Gravimetric) of Controlled Low Strength Material

C. American Concrete Institute (ACI):

SP-150-94	Controlled Low-Strength Materials

1.7 QUALITY ASSURANCE:

A. Manufacturer: Flowable fill shall be manufactured by a ready-mix concrete producer with a minimum of 1 year experience in the production of similar products.
B. Materials: For each type of material required for the work of this Section, provide primary materials that are the products of one manufacturer. If not otherwise specified here, materials shall comply with recommendations of ACI 229, “Controlled Low Strength Materials.”
C. Pre-Approval Procedures: The use of flowable fill during any part of the project shall be restricted to those incidences where, due to field conditions, the Contractor has made the Engineer of Record aware of the conditions for which he recommends the use of the flowable, and the Engineer of Record has confirmed those conditions and approved the use of the flowable fill, in advance. During the submittal process, the contractor shall prepare and submit various flowable fill mix designs corresponding to required conditions or if the contractor desires to use flowable fill due to economics. Approval for the strength of the flowable fill shall be obtained from the Engineer of Record when the contractor desires, or is required, to use flowable fill at specific location(s) within the project. Prior to commencement of field operations the contractor shall establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.
D. Sampling and Acceptance: Flowable fill shall be samples and testing in the field in conformance with either ASTM C 94 or C 685. Samples for tests shall be taken for every 115 cubic meters (150 cubic yards) of material, or fraction thereof, for each day’s placement. Tests shall include temperature reading and four compressive strength cylinders. Compressive strength sampling and testing shall conform to ASTM D 4832 with one specimen tested at 7 days, two at 28 days, and one held for each batch of four specimens. Sampling and testing shall be performed by a qualified, independent commercial testing laboratory. Test results should be submitted within 48 hours of completion of testing.

1.8 DELIVERY, STORAGE, AND HANDLING:

Deliver and handle all products and equipment required, in strict compliance with manufacturer’s recommendations. Protect from damage due to weather, excessive temperatures, and construction operations.

1.9 PROJECT CONDITIONS:

Perform installation of flowable fill only when approved by the Engineer of Record, and when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Provide flowable fill containing, at a minimum, cementitious materials and water. Cementitious materials shall be portland cement, pozzolanic materials, or other self-cementing materials, or combinations thereof, at the contractor’s option, and following approval by the Engineer of Record. The flowable fill mix design may also contain, fine aggregate or filler, and/or chemical admixtures in any proportions such that the final product meets the strength, flow consistency and shrinkage requirements included in this specification, as approved by the Engineer of Record.
    1. Portland Cement: ASTM C150, Type 1 or Type 2.

2. Mixing Water: Fresh, clean, and potable.
3. Air-Entraining Admixture: ASTM C260.
4. Chemical Admixtures: ASTM C494.
5. Aggregate: ASTM C33.

2.2 FLOWABLE FILL MIXTURE:

A. Mix design shall produce a consistency that will result in a flowable product at the time of placement which does not require manual means to move it into place.
B. Flowable fill shall have a minimum strength of 100 psi and maximum strength of 200 psi according to ASTM C39 at 28 days after placement.
C. Flowable fill shall have minimal subsidence and bleed water shrinkage. Evaporation of bleed water shall not result in shrinkage of more than 1/8 inch per foot of flowable fill depth (for mixes containing high fly ash content). Measurement of a Final Bleeding shall be as measured in Section 10 of ASTM C 940 “Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory.
D. Flowable fill shall have a unit weight of 20 - 115 lbs/ft^3measured at the point of placement after a 60 minute ready-mix truck ride. In the absence of strength data the cementitious content shall be a maximum of 150 lbs/cy.
E. Flowable fill shall have an in-place yield of a maximum of 110% of design yield for removable types at 1 year.
F. Provide equipment as recommended by the Manufacturer and comply with manufacturer’s recommendations for the addition of additives, whether at the production plant or prior to placement at the site.

PART 3 - EXECUTION

3.1 EXAMINATION:

Examine conditions of substrates and other conditions under which work is to be performed and notify Engineer of Record, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 APPLICATION OF FLOWABLE FILL:

Secure tanks, pipes and other members to be encased in flowable fill. Insure that there are no exposed metallic pipes, conduits, or other items that will be in contact with the flowable fill after placement. If so, replace with non-metallic materials or apply manufacturers recommended coating to protect metallic objects before placing the flowable fill. Replacement or protection of metallic objects is subject to the approval of the Engineer of Record.

3.3 PROTECTION AND CURING:

Protect exposed surfaces of flowable fill from premature drying, wash by rain or running water, wind, mechanical injury, and excessively hot or cold temperature. Curing method shall be subject to approval by Engineer of Record.

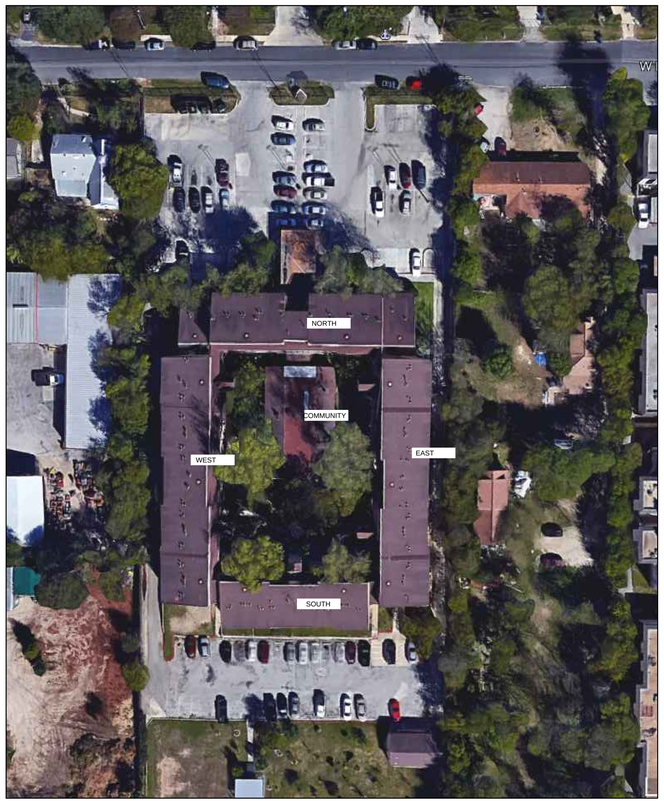
- - - E N D - - -

SAN ANTONIO HOUSING AUTHORITY
PECAN HILL APARTMENTS
TREE REMOVAL AND SANITARY SEWER RETROFIT

1600 WEST LAWNDALE

SAN ANTONIO, TEXAS

RKCI PROJECT NO. ASR17-027-00



1 A0.0 AERIAL VIEW
SCALE: NOT TO SCALE

TRUE NORTH

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INTERIM PRESIDENT &CEO
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P1.0 SANITARY SEWER RETROFIT PLAN
P1.1 SANITARY SEWER RETROFIT PLAN
P1.2 SANITARY SEWER MAIN LINE ELEVATIONS
P1.3 CONCRETE AND ASPHALT PATCH DETAILS

SCOPE OF WORK:

1. TREE REMOVAL
2. INSTALLATION OF NEW LANDSCAPE ISLANDS IN NORTH PARKING LOT
3. NEW DRAINAGE SWALE ON NORTH SIDE AND DRAINAGE IMPROVEMENTS ON WEST SIDE
4. RETROFIT OF EXISTING SANITARY SEWER SYSTEM

GENERAL NOTES

1. ALL WORK TO BE PERFORMED TO MEET ALL APPLICABLE CITY, STATE, AND FEDERAL STANDARDS, CODES REGULATIONS, AND ORDINANCES.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AFFECTING THE WORK, WHETHER SHOWN OR NOT. SOME ITEMS MAY NEED TO BE RELOCATED AS REQUIRED TO SATISFY THE DESIGN INTENT OF THE PROJECT. CONTRACTOR SHALL NOTIFY THE DESIGN TEAM AND OWNER'S REPRESENTATIVE IN WRITING OF THESE SITUATIONS.
3. CONTRACTOR TO LOCATE EXISTING BURIED UTILITIES NO LESS THAN 48 HOURS BEFORE THE START OF CONSTRUCTION.
4. SHOULD CONTRACTOR REQUIRE THE SHUT OFF OF WATER OR GAS DURING THE CONSTRUCTION PROCESS, THE OWNER MUST BE GIVEN A MINIMUM OF 72 HOUR NOTICE PRIOR TO SHUT OFF.
5. THE CONTRACTOR SHALL COORDINATE LOCATION OF STAGING AREA AND DUMPSTER WITH OWNER.
6. SECURE BUILDING AT ALL TIMES TO PREVENT UNAUTHORIZED ENTRY, VANDALISM, THEFT, AND SIMILAR VIOLATIONS OF SECURITY AND SAFETY OF BUILDING.
7. CONTRACTOR TO ENSURE BUILDING WILL BE DRIED IN AND PROTECTED FROM THE ELEMENTS AT THE END OF EVERY WORK DAY.
8. CONTRACTOR TO RE-LANDSCAPE ANY DAMAGED AREAS WITH SOD OR SEED AND MAINTAIN FOR A PERIOD OF 1 YEAR.
9. GENERAL CONTRACTOR AND SUBCONTRACTORS ARE TO SCHEDULE AND COMPLETE THEIR WORK TO KEEP MECHANICAL, ELECTRICAL, TELEPHONE, DATA, HVAC CONTROL, INTERCOM, AND OTHER EXISTING SYSTEMS OPERATIONAL IN AREA OCCUPIED BY THE OWNER DURING THE DEMOLITION/CONSTRUCTION OF THIS PROJECT.
10. PROVIDE TEMPORARY SUPPORT OF EXISTING MATERIALS AND SYSTEMS TO REMAIN IN FUNCTIONAL ORDER TO MAINTAIN THE FUNCTIONAL USE OF THE BUILDING DURING DEMOLITION/CONSTRUCTION.
11. THE CONTRACTOR IS TO PROTECT FROM DAMAGE ANY ADJACENT SURFACES THAT ARE TO REMAIN. CONTRACTOR WILL REPAIR ANY DAMAGES THAT ARE A RESULT OF THE CONTRACTOR'S CONSTRUCTION WORK AT NO ADDITIONAL COST TO THE OWNER TO A LIKE NEW CONDITION.
12. ALL PERMITTING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. RKCI TO SUBMIT AND THE CONTRACTOR TO PICK UP.
13. KEEP FIRE LANES CLEAR OF ALL CONSTRUCTION MATERIALS AND EQUIPMENT DURING AND AFTER CONSTRUCTION HOURS

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COVER SHEET

TREE REMOVAL AND SANITARY SEWER RETROFIT
PECAN HILL APARTMENTS
1600 W. LAWNDALE
SAN ANTONIO, TX

STATE OF TEXAS
LAURIE M. STOKES
130956
LICENSED
PROFESSIONAL ENGINEER

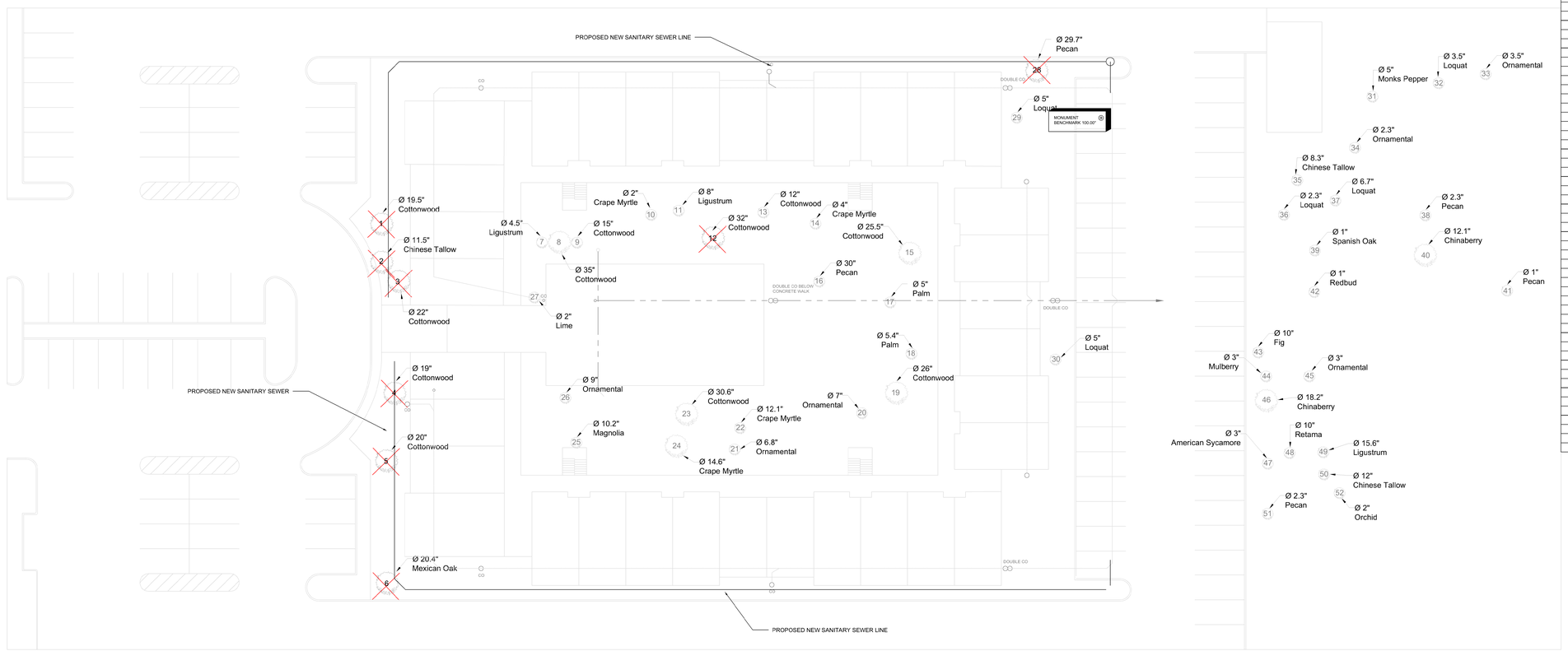
Date:

REVISIONS:

No.	DATE	DESCRIPTION

PROJECT No.:	ASR17-027-00
ISSUE DATE:	12-03-18
DRAWN BY:	LMS
CHECKED BY:	RLR
REVIEWED BY:	

CS0.0



TREE NO.	TREE TYPE	DIAMETER	CANOPY	STATUS	
1	Cottonwood	19.5	1200	Significant	TBR
2	Tallow - 11.5"				TBR
3	Cottonwood	22	1200	Significant	TBR
4	Cottonwood	19	1200	Significant	TBR
5	Cottonwood	20	1200	Significant	TBR
6	Mexican Oak	20.4		Significant	TBR
7	Lingstrum - 4.5"				
8	Cottonwood	35	1200	Heritage	
9	Cottonwood	15	1200	Significant	
10	Crepe Myrtle	2			
11	Lingstrum - 8"				
12	Cottonwood	32	1200	Heritage	TBR
13	Cottonwood	12	1200	Significant	
14	Crepe Myrtle	4			
15	Cottonwood	24.5	1200	Heritage	
16	Pecan	30	1200	Heritage	
17	Palm	5			
18	Palm	5.4			
19	Cottonwood	26	1200	Heritage	
20	Ornamental	7		Significant	
21	Ornamental	6.8		Significant	
22	Crepe Myrtle	12.1		Significant	
23	Cottonwood	30.6	1200	Heritage	
24	Crepe Myrtle	14.6		Significant	
25	Magnolia	10.2		Significant	
26	Ornamental	9		Significant	
27	Lime	2			
28	Pecan	29.7	1200	Heritage	TBR
29	Loquat	5			
30	Loquat	5			
31	Monks Pepper	5			
32	Loquat	3.5			
33	Ornamental	3.5			
34	Ornamental	2.3			
35	Chinese Tallow - 8.3"				
36	Loquat	2.3			
37	Loquat	6.7		Significant	
38	Pecan	2.3	1200		
39	Spanish Oak	1			
40	China Berry - 12.1"				
41	Pecan	1			
42	Redbud	1			
43	Fig	10		Significant	
44	Mulberry	3			
45	Ornamental	3			
46	China Berry - 18.2"				
47	American Sycamore	3			
48	Retama	10		Significant	
49	Lingstrum - 15.6"				
50	Chinese Tallow - 12"				
51	Pecan	2.3	1200		
52	Orchid	2	275		

TBR = TO BE REMOVED

1

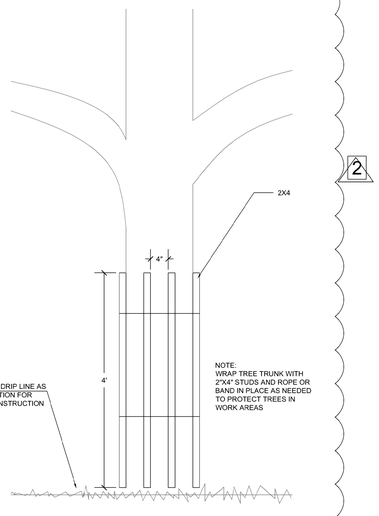
1 C1.0 SITE PLAN FOR TREE REMOVAL

NORTH

LEGEND:

EXISTING TREES TO REMAIN

EXISTING TREES TO BE REMOVED



2

2 C1.0 TREE PROTECTION PLAN

TABLE 2: SIGNIFICANT TREE CALCULATIONS		
A	TOTAL INCHES SIGNIFICANT TREES	214.30"
B	TOTAL INCHES SIGNIFICANT TREES TO REMAIN	113.40"
C	TOTAL INCHES SIGNIFICANT TREES TO BE REMOVED	100.90"
D	PERCENTAGE OF SIGNIFICANT TREES TO BE REMOVED	47%
E	PERCENTAGE OF SIGNIFICANT TREES TO REMAIN	53%
F	INCHES OF SIGNIFICANT TREES REMAINING ABOVE 40%	15.18"

TABLE 3: HERITAGE TREE CALCULATIONS		
A	TOTAL INCHES OF HERITAGE TREES TO BE REMOVED	29.70"[1]
B	TOTAL INCHES SIGNIFICANT TREES TO REMAIN ABOVE 40%	15.18"
C	TOTAL INCHES OF TREES TO BE PLANTED	13.50"
D	TOTAL INCHES OF HERITAGE TREES TO MITIGATED	1.02"

[1] TREE NO.12 - 32" COTTONWOOD IS IMPACTING ADJACENT BUILDING FOUNDATION. PLEASE SEE ENGINEER'S LETTER STATING THIS FACT.

TABLE 4: CANOPY CALCULATIONS		
A	TOTAL SIGNIFICANT TREE CANOPY	18,275
B	TOTAL SIGNIFICANT TREE CANOPY TO BE REMOVED	7,200
C	PERCENTAGE OF CANOPY TO BE REMOVED	39%
D	PERCENTAGE OF CANOPY TO REMAIN	61%

2

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TREE REMOVAL PLAN

TREE REMOVAL AND SANITARY SEWER RETROFIT
PECAN HILL APARTMENTS
1600 W. LAWNDALE
SAN ANTONIO, TX

STATE OF TEXAS
LAURIE M. STEVES
130956
LICENSED
PROFESSIONAL ENGINEER
10/11/2019

Date:

REVISIONS:

No.	DATE	DESCRIPTION
1	11-5-19	TREES NUMBERED
2	10-7-19	TREE CALCULATIONS
2	10-7-19	TREE PROTECTION PLAN

PROJECT No.:	ASR17-027-00
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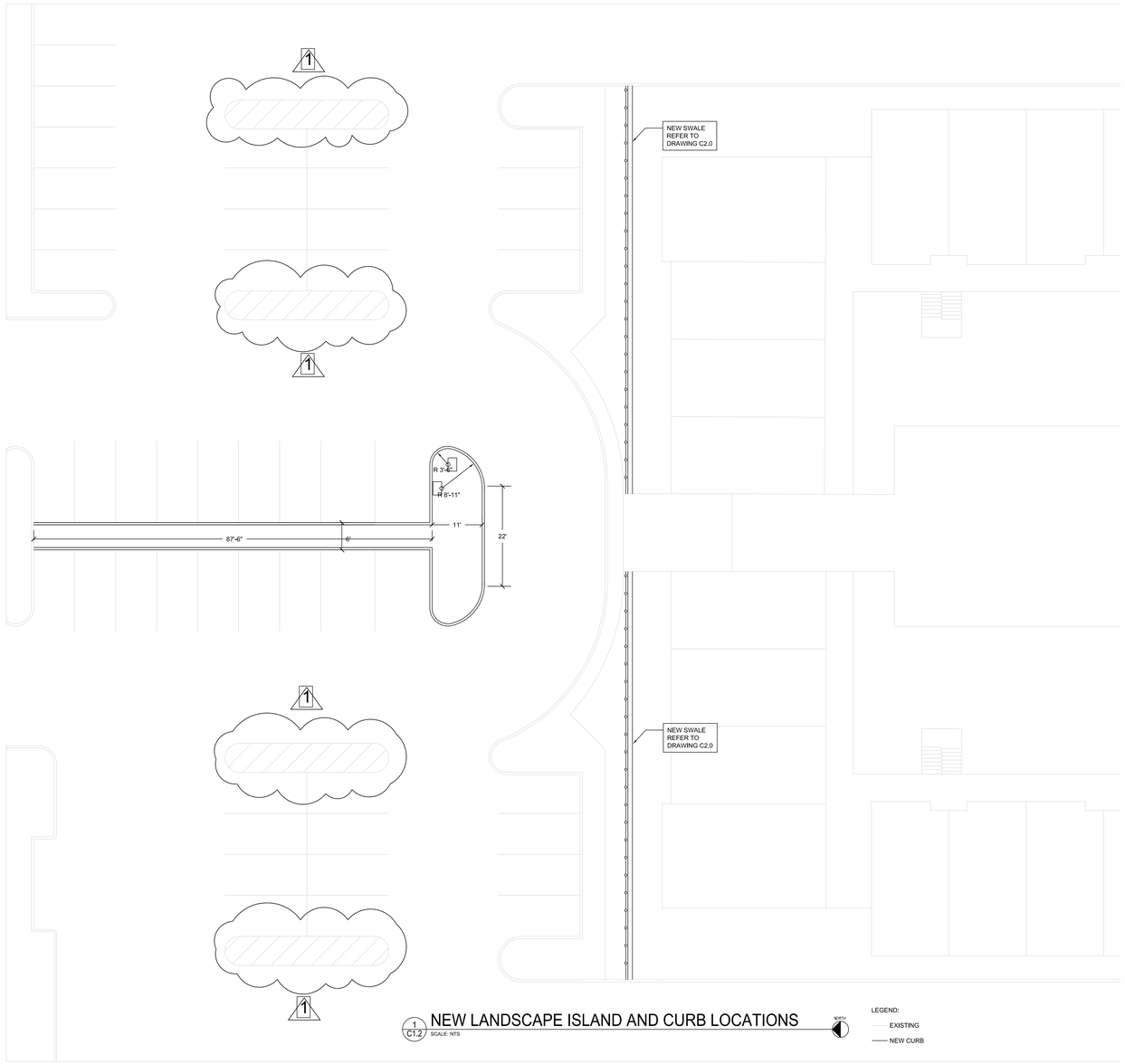
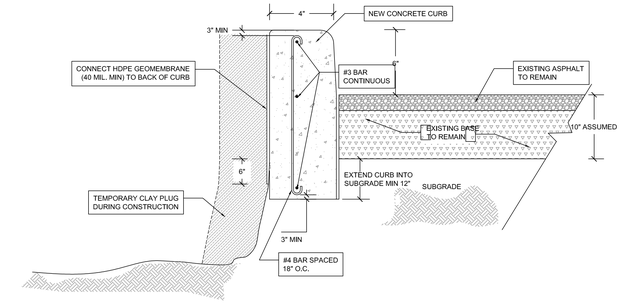
C1.0



1 C1.2 NEW LANDSCAPE ISLAND AND CURB LOCATIONS
SCALE: NTS



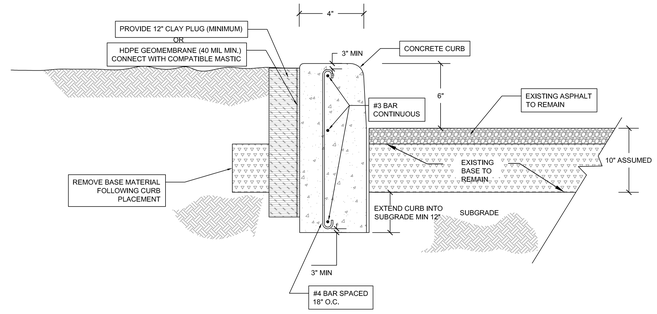
NOTE:

DO NOT EXCAVATE AND EXPOSE BASE UNTIL TREE WELL IS READY TO BE BACKFILLED. IF NOT POSSIBLE PROTECT BASE DURING CONSTRUCTION WITH 2 FT WIDE CLAY PLUG

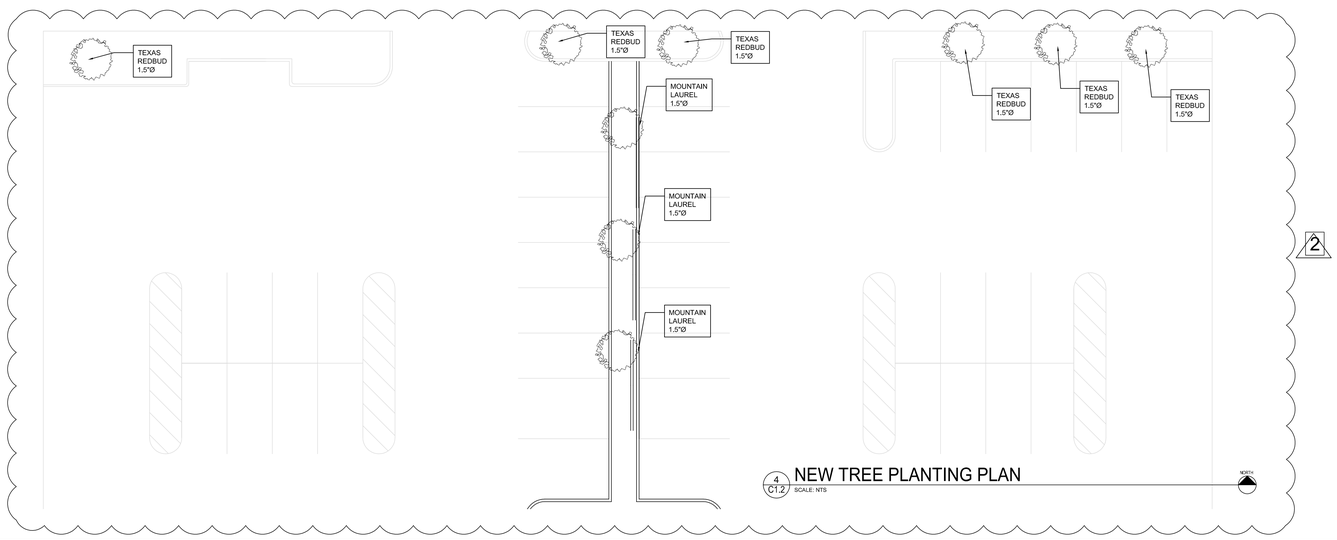
NOTE:

DO NOT EXCAVATE UNTIL NEW CURB IS IN PLACE SEE DETAIL 3/C1.1

2 C1.1 TREE WELL/LANDSCAPE ISLAND EXCAVATION DETAIL
SCALE: NTS



3 C1.1 TYPICAL CURB DETAIL
SCALE: NTS



4 C1.2 NEW TREE PLANTING PLAN
SCALE: NTS

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NEW LANDSCAPE ISLAND PLAN

TREE REMOVAL AND SANITARY SEWER RETROFIT
PECAN HILL APARTMENTS
1600 W. LAWNDALE
SAN ANTONIO, TX

STATE OF TEXAS
LAURIE M. STEVES
130956
LICENSED
PROFESSIONAL ENGINEER
8/19/19

Date:

REVISIONS:

No.	DATE	DESCRIPTION
1	11-3-19	STRIPING TO REMAIN AS IS
2	8-19-19	NEW TREE PLANTING PLAN

PROJECT No.:	ASR17-027-00
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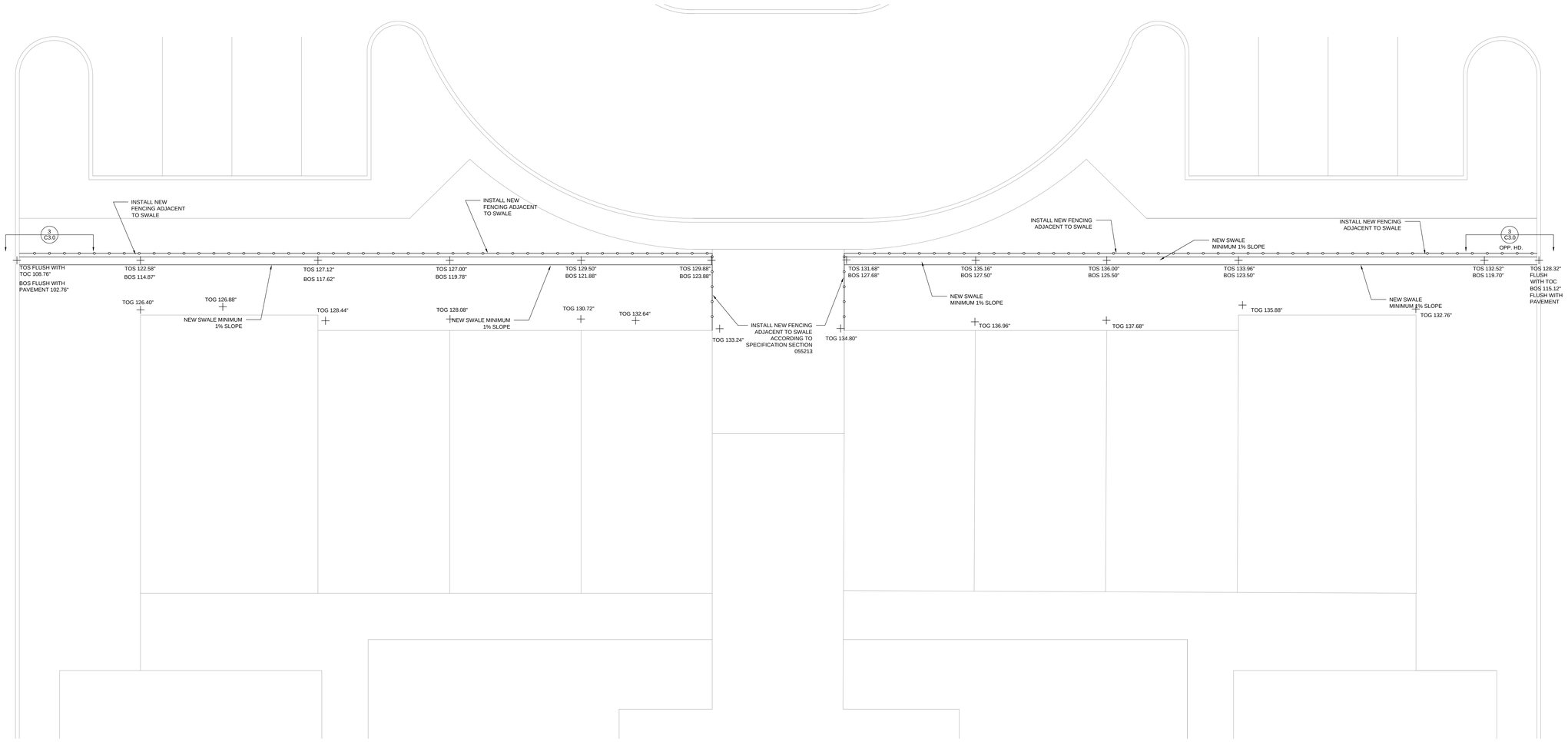
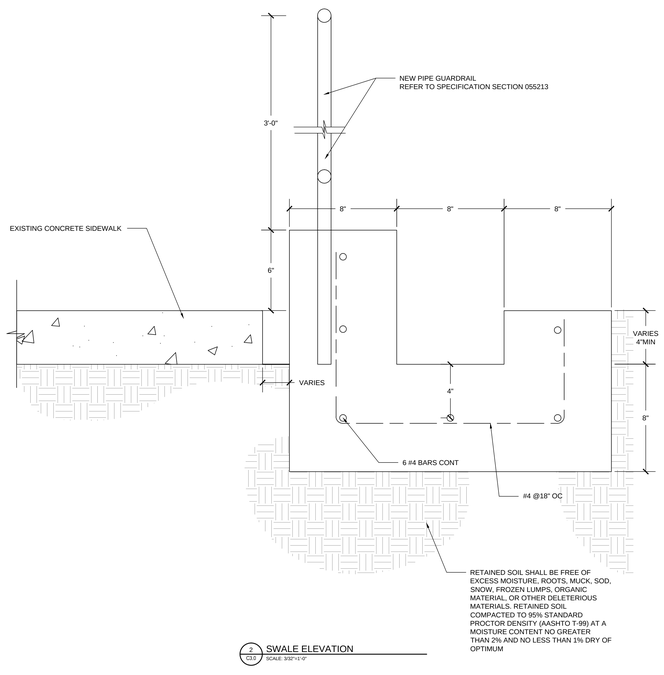
REVIEWED BY:	

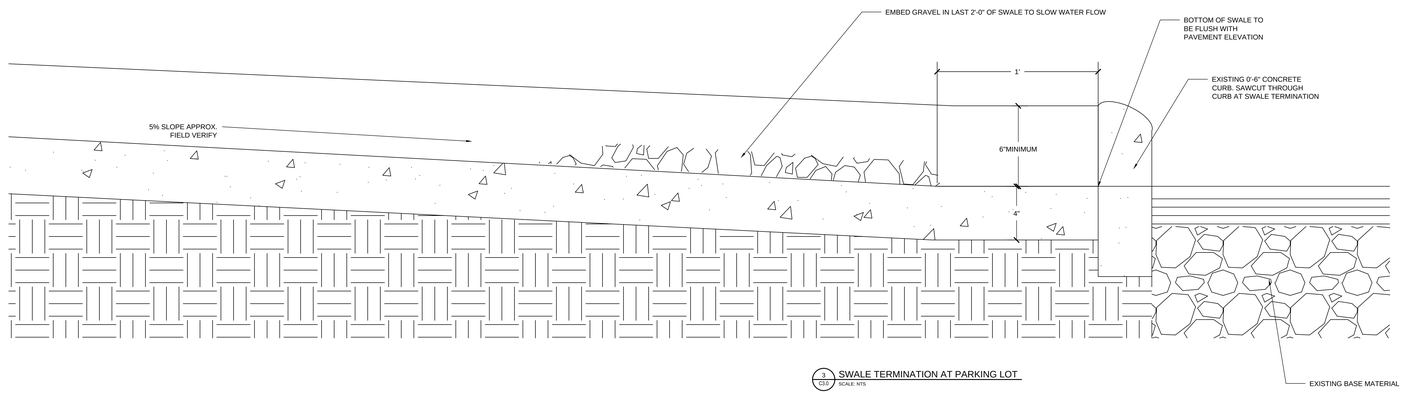
C1.1



1 C3.0 SITE PLAN WITH SWALE LOCATION
SCALE: 3/32"=1'-0"



2 C3.0 SWALE ELEVATION
SCALE: 3/32"=1'-0"



3 C3.0 SWALE TERMINATION AT PARKING LOT
SCALE: NTS

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DRAINAGE RETROFIT PLAN

TREE REMOVAL AND SANITARY SEWER RETROFIT
PECAN HILL APARTMENTS
1600 W. LAWNDALE
SAN ANTONIO, TX

STATE OF TEXAS
LAURIE M. STEVES
130956
LICENSED
PROFESSIONAL ENGINEER

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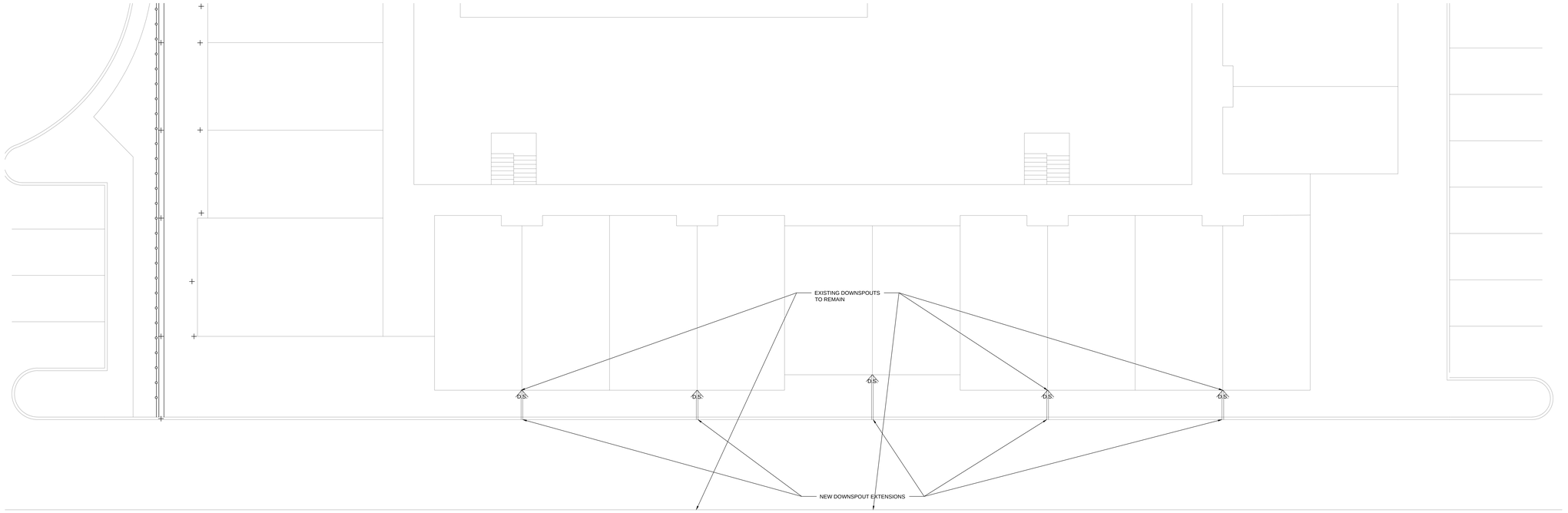
C2.0



1 C2.1 DRAINAGE RETROFIT PLAN
SCALE: 3/32"=1'-0"
3/32"=1'-0"

2 C2.1 DRAINAGE RETROFIT PLAN
SCALE: 3/32"=1'-0"

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DRAINAGE RETROFIT PLAN

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STATE OF TEXAS
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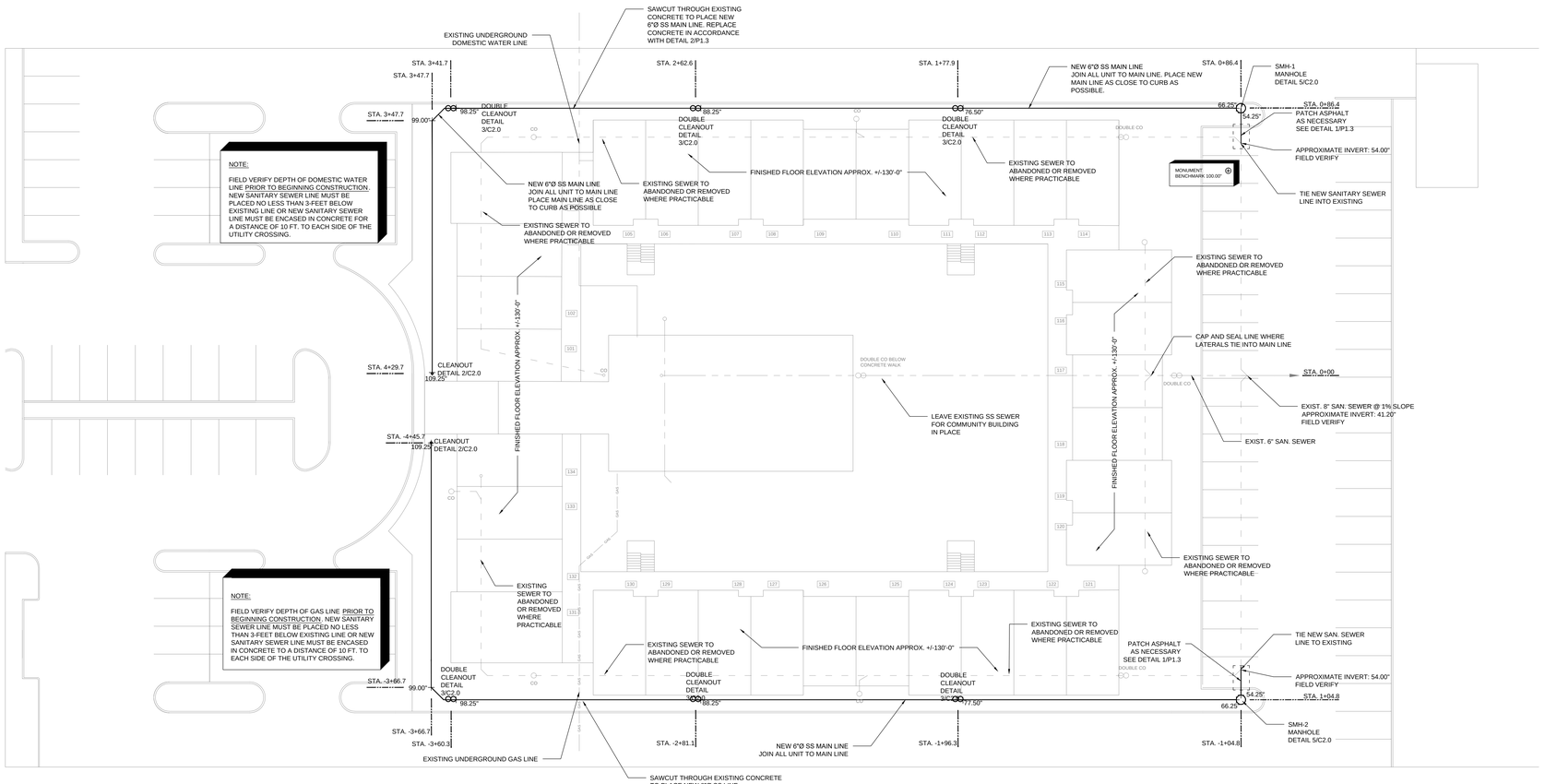


1 / C2.0 SANITARY SEWER SITE PLAN
SCALE: 1/16" = 1'-0"

GENERAL NOTES

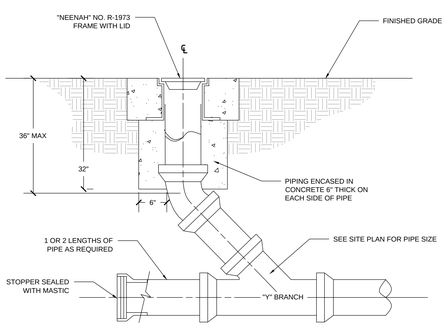
1. ALL WORK TO BE PERFORMED TO MEET ALL APPLICABLE CITY, STATE, AND FEDERAL STANDARDS, CODES REGULATIONS, AND ORDINANCES.
2. REPAIR ANY DAMAGE TO SITE AND BUILDING DUE TO DEMOLITION AND NEW CONSTRUCTION WORK.
3. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AFFECTING THE WORK, WHETHER SHOWN OR NOT. SOME ITEMS MAY NEED TO BE RELOCATED AS REQUIRED TO SATISFY THE DESIGN INTENT OF THE PROJECT. CONTRACTOR SHALL NOTIFY THE DESIGN TEAM AND OWNER'S REPRESENTATIVE IN WRITING OF THESE SITUATIONS.
4. CONTRACTOR TO LOCATE EXISTING BURIED UTILITIES NO LESS THAN 48 HOURS BEFORE THE START OF CONSTRUCTION.
5. SHOULD CONTRACTOR REQUIRE THE SHUT OFF OF WATER OR GAS DURING THE CONSTRUCTION PROCESS, THE OWNER MUST BE GIVEN A MINIMUM OF 72 HOUR NOTICE PRIOR TO SHUT OFF.
6. THE CONTRACTOR SHALL COORDINATE LOCATION OF STAGING AREA AND DUMPSTER WITH OWNER.
7. SECURE BUILDING AT ALL TIMES TO PREVENT UNAUTHORIZED ENTRY, VANDALISM, THEFT, AND SIMILAR VIOLATIONS OF SECURITY AND SAFETY OF BUILDING.
8. CONTRACTOR TO ENSURE BUILDING WILL BE DRIED IN AND PROTECTED FROM THE ELEMENTS AT THE END OF EVERY WORK DAY.
9. CONTRACTOR TO RE-LANDSCAPE ANY DAMAGED AREAS WITH SOD OR SEED AND MAINTAIN FOR A PERIOD OF 1 YEAR.
10. GENERAL CONTRACTOR AND SUBCONTRACTORS ARE TO SCHEDULE AND COMPLETE THEIR WORK TO KEEP MECHANICAL, ELECTRICAL, TELEPHONE, DATA, HVAC CONTROL, INTERCOM, AND OTHER EXISTING SYSTEMS OPERATIONAL IN AREA OCCUPIED BY THE OWNER DURING THE DEMOLITION/CONSTRUCTION OF THIS PROJECT.
11. PROVIDE TEMPORARY SUPPORT OF EXISTING MATERIALS AND SYSTEMS TO REMAIN IN FUNCTIONAL ORDER TO MAINTAIN THE FUNCTIONAL USE OF THE BUILDING DURING DEMOLITION/CONSTRUCTION.
12. THE STAGING AREAS SHALL NOT BE EXPANDED AS INDICATED. AREA IS PROVIDED TO ALLOW SUFFICIENT ROOM FOR THE CONTRACTOR TO LAYOUT AND COORDINATE BUILDING MATERIALS AND EQUIPMENT FOR THE DURATION OF THE PROJECT.
13. THE CONTRACTOR IS TO PROTECT FROM DAMAGE ANY ADJACENT SURFACES THAT ARE TO REMAIN. CONTRACTOR WILL REPAIR ANY DAMAGES THAT ARE A RESULT OF THE CONTRACTOR'S CONSTRUCTION WORK AT NO ADDITIONAL COST TO THE OWNER TO A LIKE NEW CONDITION.
14. BURIED UTILITY LINES TO BE LOCATED BY THE CONTRACTOR NO LESS THAN 48 HOURS BEFORE START OF CONSTRUCTION.
15. ALL PERMITTING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. RKCI TO SUBMIT AND THE CONTRACTOR TO PICK UP.
16. KEEP FIRE LANES CLEAR OF ALL CONSTRUCTION MATERIALS AND EQUIPMENT DURING AND AFTER CONSTRUCTION HOURS

SANITARY SEWER NOTES:

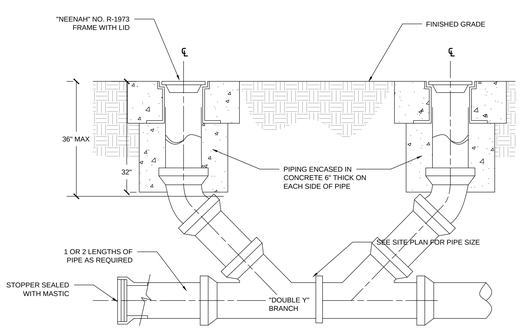
1. PRIOR TO COMMENCING PIPE INSTALLATION, FIELD VERIFY DEPTH OF EXISTING PIPE ON THE SOUTH SIDE WHERE NEW PIPE WILL TIE INTO THE EXISTING PIPE.
2. NEW PIPE SHALL HAVE A MINIMUM SLOPE OF 1/8" PER FOOT AND A MAXIMUM SLOPE OF 3" PER FOOT.
3. NEW PIPE SHALL HAVE A MINIMUM GROUND COVER OF 12"
4. TO REDUCE THE POSSIBILITY OF FUTURE SEWER LEAKS, CONTRACTOR TO UTILIZE MINIMUM JOINTS FOR BELOW SLAB PIPING. WHERE POSSIBLE, CONTRACTOR SHALL USE A CONTINUOUS PIPE FOR EACH BELOW-SLAB CONNECTION.
5. ACCORDING TO INFORMATION BULLETIN 176, DATED JANUARY 11, 2012 AND REVISED AUGUST 1, 2018, CONTRACTOR IS RESPONSIBLE FOR PROVIDING FIBER OPTIC STYLE CAMERA INSPECTIONS FOR REVIEW BY THE ONSITE CITY PLUMBING INSPECTOR.

TUNNELING NOTES:

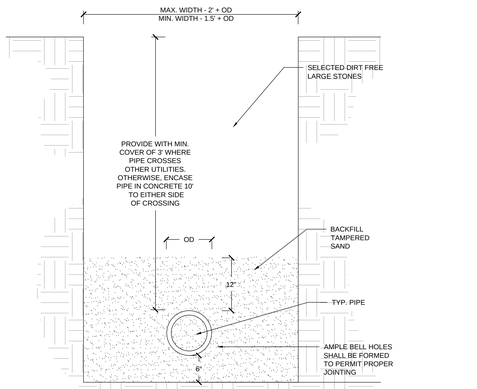
1. DEPENDING ON HOW TUNNELING IS PERFORMED, CONTRACTOR MAY NEED TO ACQUIRE A CONFINED SPACE PERMIT. ALL TUNNELING WORK IS CONSIDERED MEANS AND METHODS AND PERMITS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
2. EXCAVATE BELOW BUILDING AS NECESSARY TO PERFORM PLUMBING REPAIRS.
3. TUNNELING THROUGH THE EXISTING FLOOR SLAB IS NOT PERMITTED.
4. CONTRACTOR TO FIELD VERIFY LOCATIONS OF EXISTING FOUNDATION PIERS.
5. CONTRACTOR TO PROVIDE TEMPORARY SHORING OF THE EXISTING STRUCTURE, IF NECESSARY.
6. ONCE PLUMBING REPAIRS HAVE BEEN COMPLETED, CONTRACTOR TO FILL THE TUNNEL WITH ON-SITE SOILS MOISTURE CONDITIONED +/- 2% OF OPTIMUM AND COMPACTED TO 95% MAXIMUM DENSITY ON 8-INCH LIFTS.
7. ON-SITE SOILS SHOULD BE REPLACED TO WITHIN 1-FOOT OF THE BOTTOM OF THE SLAB.
8. FILL REMAINING VOID SPACE WITH LOW STRENGTH FLOWABLE FILL. COMPRESSIVE STRENGTH OF FLOWABLE FILL SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 100 PSI AND A MAXIMUM COMPRESSIVE STRENGTH OF 200 PSI.



2 / C2.0 SINGLE CLEANOUT DETAIL
SCALE: NTS

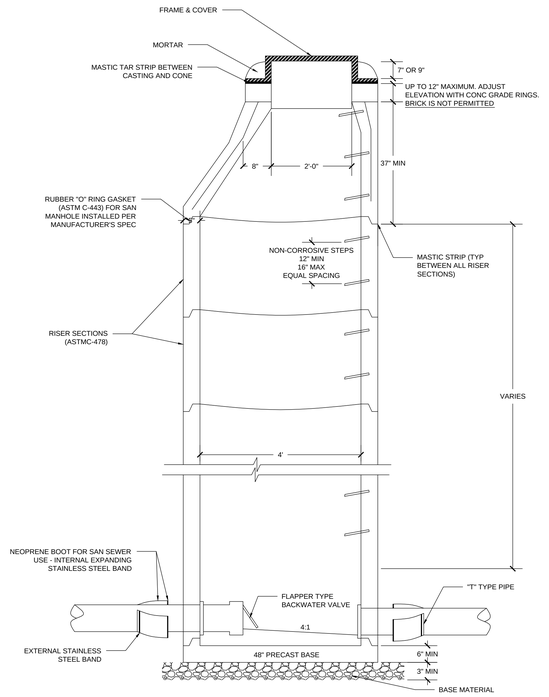


3 / C2.0 DOUBLE CLEANOUT DETAIL
SCALE: NTS



4 / C2.0 PIPE TRENCH DETAIL
SCALE: NTS

NOTE:
PIPE IS TO BE CENTERED WITHIN TRENCH AND MINIMUM WIDTH BETWEEN SIDE WALL AND PIPE IS 9"



5 / C2.0 MANHOLE DETAIL
SCALE: NTS

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SANITARY SEWER RETROFIT PLAN

TREE REMOVAL AND SANITARY SEWER RETROFIT
PECAN HILL APARTMENTS
1600 W. LAWNDALE
SAN ANTONIO, TX

STATE OF TEXAS
ROBERT L. RAFFLE
121122
LICENSED
PROFESSIONAL ENGINEER
12-3-2018

Date:

REVISIONS:

No.	DATE	DESCRIPTION

PROJECT No.:	ASR17-027-00
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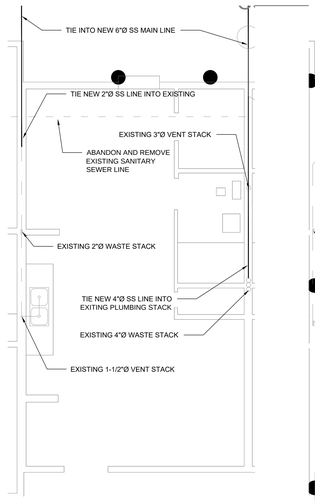
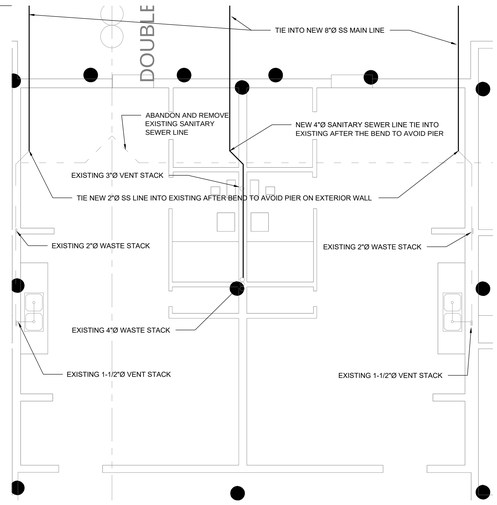
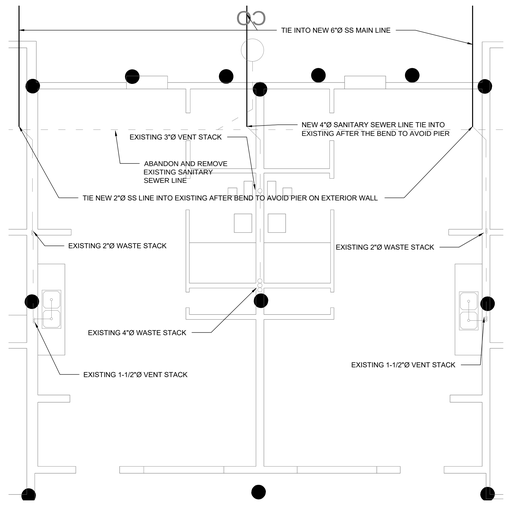
P1.0



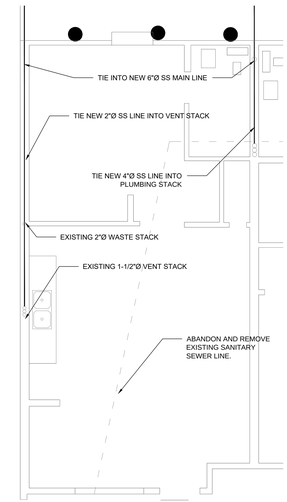
1 C2.1 **UNIT TYPE A**
UNITS 109, 110 SCALE: 1/4" = 1'-0"



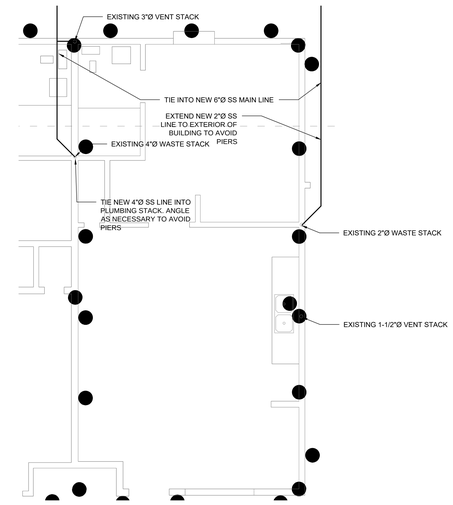
2 C2.1 **UNIT TYPE A**
UNITS 117, 118 SCALE: 1/4" = 1'-0"



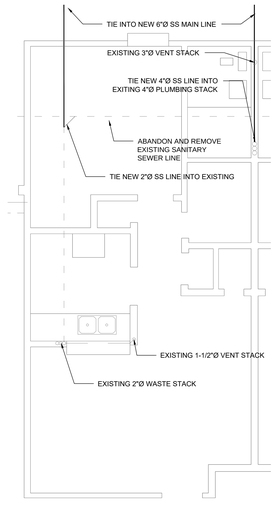
3 C2.1 **UNIT TYPE A**
UNITS 125, 126 SCALE: 1/4" = 1'-0"



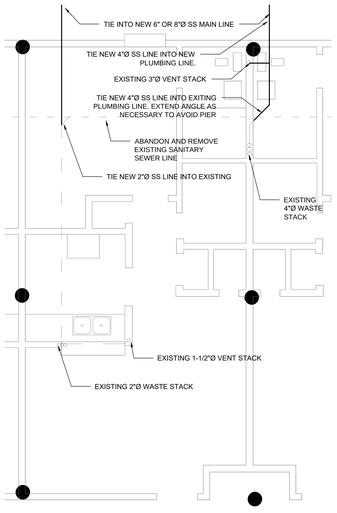
8 C2.1 **UNIT TYPE C**
UNITS 101, 111 SCALE: 1/4" = 1'-0"



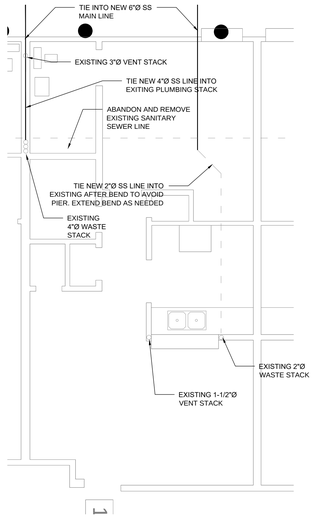
9 C2.1 **UNIT TYPE C**
UNIT 130 SCALE: 1/4" = 1'-0"



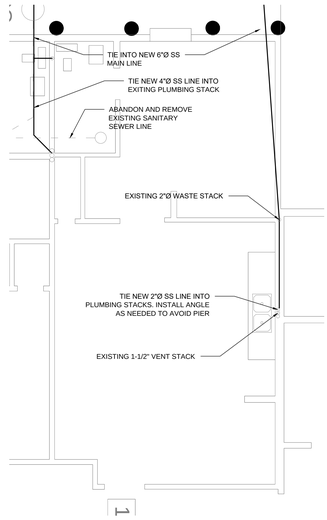
4 C2.1 **UNIT TYPE B**
UNITS 105, 106, 107, 108, 112, 132 SCALE: 1/4" = 1'-0"



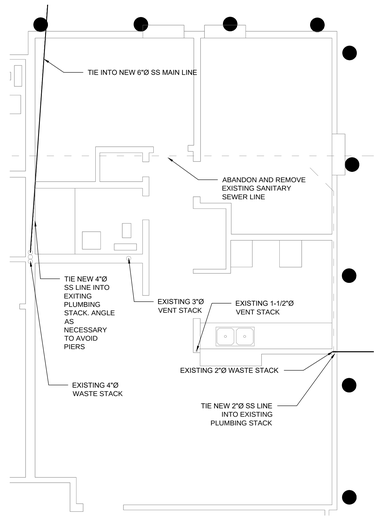
5 C2.1 **UNIT TYPE B**
UNITS 103, 113, 114, 115, 116, 119, 120, 121, 122, 123, 124, 127, 128, 129, 133 SCALE: 1/4" = 1'-0"



6 C2.1 **UNIT TYPE B**
UNIT 102 SCALE: 1/4" = 1'-0"



7 C2.1 **UNIT TYPE C**
UNIT 134 SCALE: 1/4" = 1'-0"



10 C2.1 **UNIT TYPE D**
UNITS 104, 131 SCALE: 1/4" = 1'-0"

NOTE:
SYMBOL INDICATES ASSUMED PIER PLACEMENT. ALL PIER LOCATIONS THAT MAY INFLUENCE BELOW GRADE PIPING MUST BE FIELD VERIFIED BEFORE PIPE PLACEMENT.

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SANITARY SEWER RETROFIT PLAN

TREE REMOVAL AND SANITARY SEWER RETROFIT
PECAN HILL APARTMENTS
1600 W. LAWNDALE
SAN ANTONIO, TX

STATE OF TEXAS
ROBERT L. RAFFLE
121122
LICENSED
PROFESSIONAL ENGINEER
12-3-2018

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REVISIONS:

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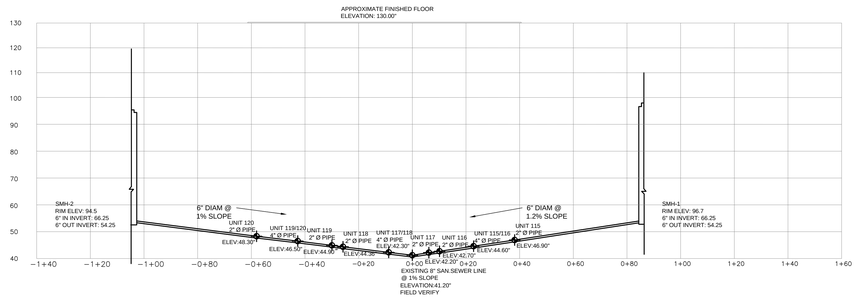
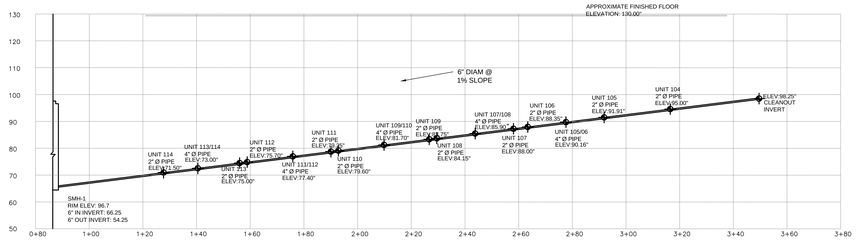


3 C2.2

SANITARY SEWER SOUTH ELEVATION

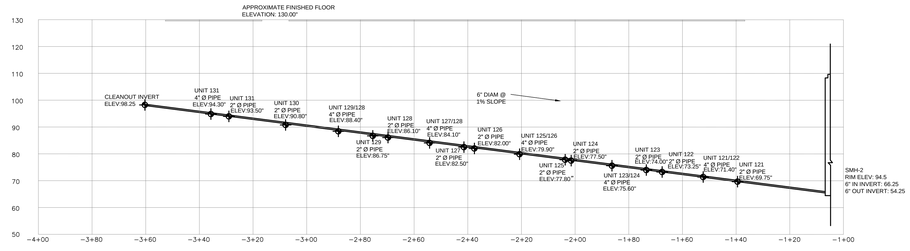
HORIZ. SCALE: 1"= 20'-0"
VERT. SCALE: 1"= 0'-20"



1 C2.2

SANITARY SEWER EAST ELEVATION
PROFILE - SANITARY SEWER

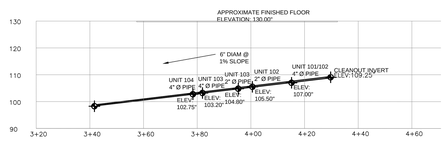
HORIZ. SCALE: 1"= 20'-0"
VERT. SCALE: 1"= 0'-20"



2 C2.2

SANITARY SEWER WEST ELEVATION

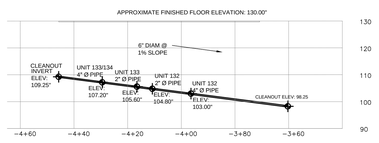
HORIZ. SCALE: 1"= 20'-0"
VERT. SCALE: 1"= 0'-20"



SANITARY SEWER NORTH ELEVATION: WEST-SOUTH FLOW

3 C2.2

HORIZ. SCALE: 1"= 20'-0"
VERT. SCALE: 1"= 0'-20"



SANITARY SEWER NORTH ELEVATION: EAST-SOUTH FLOW

3 C2.2

HORIZ. SCALE: 1"= 20'-0"
VERT. SCALE: 1"= 0'-20"

NOTE:

ALL APARTMENT UNIT SAN. SEWER INVERT
CONNECTIONS ARE APPROXIMATE.
FIELD VERIFY SEWER ROUTING FROM APARTMENT
UNITS AND INVERT CONNECTION PRIOR TO INSTALLATION

GENERAL NOTES

1. ALL WORK TO BE PERFORMED TO MEET ALL APPLICABLE CITY, STATE, AND FEDERAL STANDARDS, CODES REGULATIONS, AND ORDINANCES.
2. REPAIR ANY DAMAGE TO SITE AND BUILDING DUE TO DEMOLITION AND NEW CONSTRUCTION WORK.
3. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AFFECTING THE WORK, WHETHER SHOWN OR NOT. SOME ITEMS MAY NEED TO BE RELOCATED AS REQUIRED TO SATISFY THE DESIGN INTENT OF THE PROJECT. CONTRACTOR SHALL NOTIFY THE DESIGN TEAM AND OWNER'S REPRESENTATIVE IN WRITING OF THESE SITUATIONS.
4. CONTRACTOR TO LOCATE EXISTING BURIED UTILITIES NO LESS THAN 48 HOURS BEFORE THE START OF CONSTRUCTION.
5. SHOULD CONTRACTOR REQUIRE THE SHUT OFF OF WATER OR GAS DURING THE CONSTRUCTION PROCESS, THE OWNER MUST BE GIVEN A MINIMUM OF 72 HOUR NOTICE PRIOR TO SHUT OFF.
6. THE CONTRACTOR SHALL COORDINATE LOCATION OF STAGING AREA AND DUMPSTER WITH OWNER.
7. SECURE BUILDING AT ALL TIMES TO PREVENT UNAUTHORIZED ENTRY, VANDALISM, THEFT, AND SIMILAR VIOLATIONS OF SECURITY AND SAFETY OF BUILDING.
8. CONTRACTOR TO ENSURE BUILDING WILL BE DRIED IN AND PROTECTED FROM THE ELEMENTS AT THE END OF EVERY WORK DAY.
9. CONTRACTOR TO RE-LANDSCAPE ANY DAMAGED AREAS WITH SOD OR SEED AND MAINTAIN FOR A PERIOD OF 1 YEAR.
10. GENERAL CONTRACTOR AND SUBCONTRACTORS ARE TO SCHEDULE AND COMPLETE THEIR WORK TO KEEP MECHANICAL, ELECTRICAL, TELEPHONE, DATA, HVAC CONTROL, INTERCOM, AND OTHER EXISTING SYSTEMS OPERATIONAL IN AREA OCCUPIED BY THE OWNER DURING THE DEMOLITION/CONSTRUCTION OF THIS PROJECT.
11. PROVIDE TEMPORARY SUPPORT OF EXISTING MATERIALS AND SYSTEMS TO REMAIN IN FUNCTIONAL ORDER TO MAINTAIN THE FUNCTIONAL USE OF THE BUILDING DURING DEMOLITION/CONSTRUCTION.
12. THE STAGING AREAS SHALL NOT BE EXPANDED AS INDICATED. AREA IS PROVIDED TO ALLOW SUFFICIENT ROOM FOR THE CONTRACTOR TO LAYOUT AND COORDINATE BUILDING MATERIALS AND EQUIPMENT FOR THE DURATION OF THE PROJECT.
13. THE CONTRACTOR IS TO PROTECT FROM DAMAGE ANY ADJACENT SURFACES THAT ARE TO REMAIN. CONTRACTOR WILL REPAIR ANY DAMAGES THAT ARE A RESULT OF THE CONTRACTOR'S CONSTRUCTION WORK AT NO ADDITIONAL COST TO THE OWNER TO A LIKE NEW CONDITION.
14. BURIED UTILITY LINES TO BE LOCATED BY THE CONTRACTOR NO LESS THAN 48 HOURS BEFORE START OF CONSTRUCTION.
15. ALL PERMITTING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. RKCI TO SUBMIT AND THE CONTRACTOR TO PICK UP.
16. KEEP FIRE LANES CLEAR OF ALL CONSTRUCTION MATERIALS AND EQUIPMENT DURING AND AFTER CONSTRUCTION HOURS

SANITARY SEWER NOTES:

1. PRIOR TO COMMENCING PIPE INSTALLATION, FIELD VERIFY DEPTH OF EXISTING PIPE ON THE SOUTH SIDE WHERE NEW PIPE WILL TIE INTO THE EXISTING PIPE.
2. NEW PIPE SHALL HAVE A MINIMUM SLOPE OF 1/8" PER FOOT AND A MAXIMUM SLOPE OF 3" PER FOOT.
3. NEW PIPE SHALL HAVE A MINIMUM GROUND COVER OF 12"
4. TO REDUCE THE POSSIBILITY OF FUTURE SEWER LEAKS, CONTRACTOR TO UTILIZE MINIMUM JOINTS FOR BELOW SLAB PIPING. WHERE POSSIBLE, CONTRACTOR SHALL USE A CONTINUOUS PIPE FOR EACH BELOW-SLAB CONNECTION.
5. ACCORDING TO INFORMATION BULLETIN 176, DATED JANUARY 11, 2012 AND REVISED AUGUST 1, 2018, CONTRACTOR IS RESPONSIBLE FOR PROVIDING FIBER OPTIC STYLE CAMERA INSPECTIONS FOR REVIEW BY THE ONSITE CITY PLUMBING INSPECTOR.

FIXTURE COUNT				
BUILDING	TOTAL APT. UNITS	FIXTURE UNITS PER APT.	TOTAL FIXTURE UNITS	DESCRIPTION
NORTH EAST-SOUTH FLOW WEST-SOUTH FLOW	12 + LAUNDRY 12	 8 8	 112 96	EACH UNIT INCLUDES: • 1 RESIDENTIAL LAVATORY SINK • 1 WATER CLOSET (F. TANK) • 1 BATHTUB WITH SHOWERHEAD • 1 RESIDENTIAL KITCHEN SINK ALSO INCLUDED: • 2 SERVICE SINKS • 4 COMMERCIAL CLOTHES WASHERS
EAST SOUTH FLOW	30	8	240	EACH UNIT INCLUDES: • 1 RESIDENTIAL LAVATORY • 1 WATER CLOSET (F. TANK) • 1 BATHTUB WITH SHOWERHEAD • 1 RESIDENTIAL KITCHEN SINK
SOUTH WEST-SOUTH FLOW EAST-SOUTH FLOW	9 9	8 8	72 72	EACH UNIT INCLUDES: • 1 RESIDENTIAL LAVATORY • 1 WATER CLOSET (F. TANK) • 1 BATHTUB WITH SHOWERHEAD • 1 RESIDENTIAL KITCHEN SINK
WEST SOUTH FLOW	30	8	240	EACH UNIT INCLUDES: • 1 RESIDENTIAL LAVATORY • 1 WATER CLOSET (F. TANK) • 1 BATHTUB WITH SHOWERHEAD • 1 RESIDENTIAL KITCHEN SINK
COMMUNITY CENTER SOUTH FLOW	1	22	22	COMMUNITY CENTER INCLUDES: • 2 WATER CLOSETS (F. TANK) • 2 LAVATORIES • 1 KITCHEN SINK WITH DISHWASHER • 1 DISHWASHER • 2 SERVICE SINKS • 2 COMMERCIAL CLOTHES WASHERS

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SANITARY SEWER MAIN LINE ELEVATIONS

TREE REMOVAL AND SANITARY SEWER RETROFIT
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1600 W. LAWNDALE
SAN ANTONIO, TX

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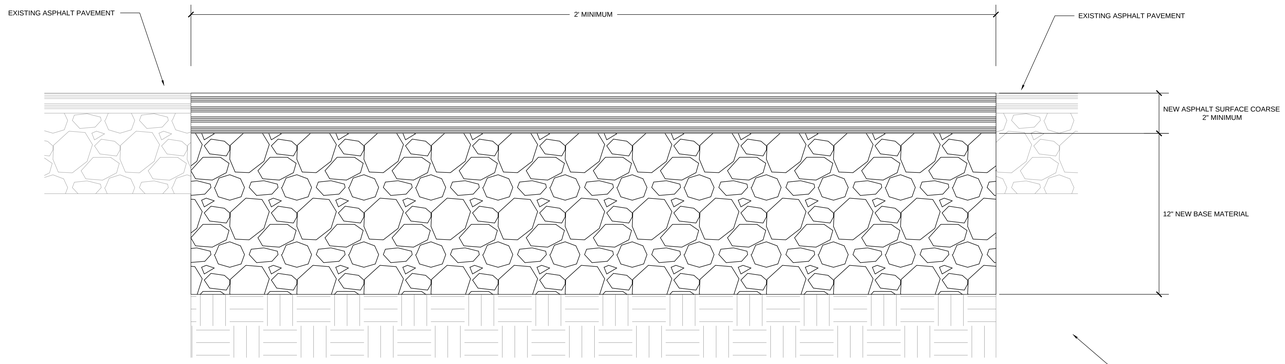

1 / P1.4 ASPHALTIC CONCRETE PATCH
SCALE: NTS

NOTES

PRODUCTS

1. ASPHALT

USE THE FOLLOWING MATERIALS, OF THE SAME TYPE, BRAND, AND SOURCE THROUGHOUT THE PROJECT
HMAC TYPE D HOT MIX ASPHALT
TACK COAT USED AROUND EDGES OF ASPHALT PATCH INCLUDING CURBS WHERE NEW ASPHALT ABUTS EXISTING CURBS.

PROCEDURE

1. DEMOLITION

WHERE THE EXISTING PAVEMENT IS TO BE REMOVED, IT SHALL BE REMOVED FOR THE ENTIRE DEPTH AND DISPOSED OF IN A SATISFACTORY MANNER.
CONTRACTOR TO SAWCUT THE EXISTING PAVEMENT AT A STRAIGHT EDGE

2. SUBGRADE

THE SUBGRADE FOR PAVEMENT SHALL BE FORMED BY EXCAVATING TO THE REQUIRED DEPTH AND THE CROSS SECTION SHAPED TO MATCH EXISTING
SUBGRADE SHALL BE THOROUGHLY COMPACTED BY ROLLING OR TAMPING TO 95% COMPACTION BEFORE PLACING ANY ASPHALT.
ALL SOFT AND SPONGY PLACES SHALL BE REMOVED AND ALL DEPRESSIONS FILLED WITH SUITABLE MATERIAL WHICH SHALL BE THOROUGHLY COMPACTED IN LAYERS NOT EXCEEDING 8" IN THICKNESS.
WHERE TREE ROOTS ARE ENCOUNTERED, THEY SHALL BE REMOVED TO A DEPTH OF ONE FOOT FOR THE FULL WIDTH OF THE PAVEMENT.

3. NEW PAVEMENT

NEW PAVEMENT THICKNESS SHALL MEET THICKNESS OF EXISTING BUT SHALL NOT BE LESS THAN 3 INCHES.
THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH LEVEL PATCH

2 / P1.4 PCC CONCRETE SIDEWALK REPAIR DETAIL
SCALE: NTS

NOTES

PRODUCTS

1. CONCRETE

USE THE FOLLOWING CEMENTITIOUS MATERIALS, OF THE SAME TYPE, BRAND, AND SOURCE THROUGHOUT THE PROJECT
PORTLAND CEMENT: ASTM C150, TYPE I/II GRAY. OPTIONAL TO SUPPLEMENT WITH THE FOLLOWING:
FLY ASH: ASTM C618 CLASS F OR C
NORMAL-WEIGHT AGGREGATES: ASTM C33, GRADED
MAXIMUM COARSE AGGREGATE SIDE: 1-INCH NOMINAL OR LESS
FINE AGGREGATE: FREE OF MATERIALS WITH DELETERIOUS REACTIVITY TO ALKALI IN CEMENT
WATER: ASTM C94/C94M OR POTABLE

PROPORTION NORMAL-WEIGHT CONCRETE MIXTURE AS FOLLOWS:
MINIMUM COMPRESSIVE STRENGTH: 3500 PSI AT 28 DAYS
MAXIMUM WATER-CEMENTITIOUS MATERIALS RATIO: 0.60
SLUMP LIMIT: CONCRETE SHOULD BE WORKABLE AND FILL ALL CORNER OF THE CONCRETE FORMS WHILE STILL MAINTAINING PROPER SHAPE

2. REINFORCEMENT

FABRICATE STEEL REINFORCEMENT ACCORDING TO CRSI'S "MANUAL OF STANDARD PRACTICE"
16" #3 SMOOTH DOWELS SHALL CENTERED AT THE JOINT BETWEEN THE EXISTING SIDEWALK AND THE NEW SIDEWALK AND SHALL BE SPACED 12" O.C.
REINFORCEMENT SHALL BE #3 REBAR PLACED 12" O.C. BOTH WAYS

3. FORMWORK

FORMS USED IN THE CONSTRUCTION OF SIDEWALKS SHALL BE OF WOOD OR METAL AND EXTEND THE FULL DEPTH OF THE CONCRETE
FORMS SHALL BE STRAIGHT, FREE FROM WARP, AND OF SUFFICIENT STRENGTH. FORMS SHALL BE STAKED SECURELY ENOUGH TO RESIST THE PRESSURE OF THE CONCRETE WITHOUT SPRINGING

PROCEDURE

1. DEMOLITION

WHERE THE EXISTING SIDEWALK IS TO BE REMOVED, IT SHALL BE REMOVED FOR THE ENTIRE DEPTH AND DISPOSED OF IN A SATISFACTORY MANNER.
CONTRACTOR MUST SAWCUT EXISTING SIDEWALK AT EXISTING CONSTRUCTION JOINT.

2. SUBGRADE

THE SUBGRADE FOR SIDEWALKS SHALL BE FORMED BY EXCAVATING TO THE REQUIRED DEPTH AND THE CROSS SECTION SHAPED TO MATCH EXISTING
SUBGRADE SHALL BE THOROUGHLY COMPACTED BY ROLLING OR TAMPING TO 95% COMPACTION BEFORE PLACING ANY CONCRETE.
ALL SOFT AND SPONGY PLACES SHALL BE REMOVED AND ALL DEPRESSIONS FILLED WITH SUITABLE MATERIAL WHICH SHALL BE THOROUGHLY COMPACTED IN LAYERS NOT EXCEEDING 8" IN THICKNESS.
WHERE TREE ROOTS ARE ENCOUNTERED, THEY SHALL BE REMOVED TO A DEPTH OF ONE FOOT FOR THE FULL WIDTH OF THE SIDEWALK.

3. NEW SIDEWALK

THE SIZE OF THE NEW SIDEWALK SHALL BE OF THE SAME WIDTH AS THAT OF THE EXISTING SIDEWALK.
NO CONCRETE SHALL BE PLACED UNTIL THE FORMS AND SUBGRADE HAVE BEEN APPROVED BY THE ENGINEER.
THE SUBGRADE SHALL BE THOROUGHLY WETTED AND THE CONCRETE SHALL BE PLACED IN ONE COURSE TO THE REQUIRED DEPTH.
THE CONCRETE SHALL BE THOROUGHLY SPADEED AND RAMMED AND STRUCK OFF WITH A TEMPLATE TO THE REQUIRED GRADE AND CROSS SECTION.
SUCCESSIVE BATCHES OF CONCRETE SHALL BE DEPOSITED IN A CONTINUOUS OPERATION UNTIL INDIVIDUAL SECTIONS ARE COMPLETED.
AFTER THE CONCRETE HAS BEEN BROUGHT TO THE FINISHED GRADE, IT SHALL BE FLOATED WITH A WOODEN FLOAT TO PRODUCE A SURFACE FREE FROM IRREGULARITIES.

THE FINAL SURFACE SHALL BE OBTAINED BY TROWELING WITH A STEEL TROWEL OR HAND FLOAT AND BRUSHING LIGHTLY WITH A LIGHT WEIGHT BRUSH IN A TRANSVERSE DIRECTIONS SO AS TO PRODUCE A UNIFORM GRITTY SURFACE OF A TEXTURE TO MATCH THE EXISTING.

4. JOINTS

CONTRACTION JOINTS SHALL BE PROVIDED UNIFORMLY TO SEPARATE THE SLAB AND SHALL BE CUT IN A STRAIGHT LINE TO A DEPTH EQUAL TO AT LEAST ONE-THIRD (1/3) OF THE TOTAL SLAB THICKNESS. THE JOINT SHALL NOT BE LESS THAN 1/8" NOR MORE THAN 1/4" IN WIDTH.

JOINT SEALANT SHALL BE PLACED BETWEEN ALL SIDEWALKS AND ADJOINING BACKS OF CURBS AND BETWEEN THE INTERSECTION OF TWO SIDEWALKS.

THE JOINT FILLER SHALL EXTEND THE FULL DEPTH OF THE CONCRETE.

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CONCRETE AND ASPHALT PATCH DETAILS

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SAN ANTONIO, TX

STATE OF TEXAS
ROBERT L. RAFFLE
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P1.3

ATTACHMENT B
HUD Form Forms and
Conflict of Interest Questionnaire
Form 1295 Certificate of Interested Parties

*(Form 1295 is to be completed online by the ***Selected Respondent*** and submitted to the Texas Ethics Commission pursuant to Government Code 2252.908 and a copy returned to SAHA with the Certification prior to contract execution. A copy of the 1295 Form is included herein for information purposes only).*

General Conditions for Construction Contracts - Public Housing Programs

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing
OMB Approval No. 2577-0157 (exp. 3/31/2020)

Applicability. This form is applicable to any construction/development contract greater than $150,000.

This form includes those clauses required by OMB's common rule on grantee procurement, implemented at HUD in 2 CFR 200, and those requirements set forth in Section 3 of the Housing and Urban Development Act of 1968 and its amendment by the Housing and Community Development Act of 1992, implemented by HUD at 24 CFR Part 135. The form is required for construction contracts awarded by Public Housing Agencies (PHAs).
The form is used by Housing Authorities in solicitations to provide necessary contract clauses. If the form were not used, HAs would be unable to enforce their contracts.
Public reporting burden for this collection of information is estimated to average 1.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Responses to the collection of information are required to obtain a benefit or to retain a benefit.
The information requested does not lend itself to confidentiality.
HUD may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB number.

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1. Definitions

(a) "Architect" means the person or other entity engaged by the PHA to perform architectural, engineering, design, and other services related to the work as provided for in the contract. When a PHA uses an engineer to act in this capacity, the terms "architect" and "engineer" shall be synonymous. The Architect shall serve as a technical representative of the Contracting Officer. The Architect's authority is as set forth elsewhere in this contract.

(b) "Contract" means the contract entered into between the PHA and the Contractor. It includes the forms of Bid, the Bid Bond, the Performance and Payment Bond or Bonds or other assurance of completion, the Certifications, Representations, and Other Statements of Bidders (form HUD-5370), these General Conditions of the Contract for Construction (form HUD-5370), the applicable wage rate determinations from the U.S. Department of Labor, any special conditions included elsewhere in the contract, the specifications, and drawings. It includes all formal changes to any of those documents by addendum, change order, or other modification.

(c) "Contracting Officer" means the person delegated the authority by the PHA to enter into, administer, and/or terminate this contract and designated as such in writing to the Contractor. The term includes any successor Contracting Officer and any duly authorized representative of the Contracting Officer also designated in writing. The Contracting Officer shall be deemed the authorized agent of the PHA in all dealings with the Contractor.

(d) "Contractor" means the person or other entity entering into the contract with the PHA to perform all of the work required under the contract.

(e) "Drawings" means the drawings enumerated in the schedule of drawings contained in the Specifications and as described in the contract clause entitled Specifications and Drawings for Construction herein.

(f) "HUD" means the United States of America acting through the Department of Housing and Urban Development including the Secretary, or any other person designated to act on its behalf. HUD has agreed, subject to the provisions of an Annual Contributions Contract (ACC), to provide financial assistance to the PHA, which includes assistance in financing the work to be performed under this contract. As defined elsewhere in these General Conditions or the contract documents, the determination of HUD may be required to authorize changes in the work or for release of funds to the PHA for payment to the Contractor. Notwithstanding HUD's role, nothing in this contract shall be construed to create any contractual relationship between the Contractor and HUD.

(g) "Project" means the entire project, whether construction or rehabilitation, the work for which is provided for in whole or in part under this contract.

(h) "PHA" means the Public Housing Agency organized under applicable state laws which is a party to this contract.

(j) "Specifications" means the written description of the technical requirements for construction and includes the criteria and tests for determining whether the requirements are met.

(l) "Work" means materials, workmanship, and manufacture and fabrication of components.

2. Contractor's Responsibility for Work

(a) The Contractor shall furnish all necessary labor, materials, tools, equipment, and transportation necessary for performance of the work. The Contractor shall also furnish all necessary water, heat, light, and power not made available to the Contractor by the PHA pursuant to the clause entitled Availability and Use of Utility Services herein.

(b) The Contractor shall perform on the site, and with its own organization, work equivalent to at least [ ] (12 percent unless otherwise indicated) of the total amount of work to be performed under the order. This percentage may be reduced by a supplemental agreement to this order if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the PHA.

(c) At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.

(d) The Contractor shall be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence, and shall take proper safety and health precautions to protect the work, the workers, the public, and the property of others. The Contractor shall hold and save the PHA, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

(e) The Contractor shall lay out the work from base lines and bench marks indicated on the drawings and be responsible for all lines, levels, and measurements of all work executed under the contract. The Contractor shall verify the figures before laying out the work and will be held responsible for any error resulting from its failure to do so.

(f) The Contractor shall confine all operations (including storage of materials) on PHA premises to areas authorized or approved by the Contracting Officer.

(g) The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. After completing the work and before final inspection, the Contractor shall (1) remove from the premises all scaffolding, equipment, tools, and materials (including rejected materials) that are not the property of the PHA and all rubbish caused by its work; (2) leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer; (3) perform all specified tests; and, (4) deliver the installation in complete and operating condition.

(h) The Contractor's responsibility will terminate when all work has been completed, the final inspection made, and the work accepted by the Contracting Officer. The Contractor will then be released from further obligation except as required by the warranties specified elsewhere in the contract.

3. Architect's Duties, Responsibilities, and Authority

(a) The Architect for this contract, and any successor, shall be designated in writing by the Contracting Officer.

(b) The Architect shall serve as the Contracting Officer's technical representative with respect to architectural, engineering, and design matters related to the work performed under the contract. The Architect may provide direction on contract performance. Such direction shall be within the scope of the contract and may not be of a nature which: (1) institutes additional work outside the scope of the contract; (2) constitutes a change as defined in the Changes clause herein; (3) causes an increase or decrease in the cost of the contract; (4) alters the Construction Progress Schedule; or (5) changes any of the other express terms or conditions of the contract.

(c) The Architect's duties and responsibilities may include but shall not be limited to:

(1) Making periodic visits to the work site, and on the basis of his/her on-site inspections, issuing written reports to the PHA which shall include all observed deficiencies. The Architect shall file a copy of the report with the Contractor's designated representative at the site;

(2) Making modifications in drawings and technical specifications and assisting the Contracting Officer in the preparation of change orders and other contract modifications for issuance by the Contracting Officer;

(3) Reviewing and making recommendations with respect to - (i) the Contractor's construction progress schedules; (ii) the Contractor's shop and detailed drawings; (iii) the machinery, mechanical and other equipment and materials or other articles proposed for use by the Contractor; and, (iv) the Contractor's price breakdown and progress payment estimates; and,

(4) Assisting in inspections, signing Certificates of Completion, and making recommendations with respect to acceptance of work completed under the contract.

4. Other Contracts

The PHA may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with PHA employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by PHA employees

Construction Requirements

5. Pre-construction Conference and Notice to Proceed

(a) Within ten calendar days of contract execution, and prior to the commencement of work, the Contractor shall attend a preconstruction conference with representatives of the PHA, its Architect, and other interested parties convened by the PHA. The conference will serve to acquaint the participants with the general plan of the construction operation and all other requirements of the contract. The PHA will provide the Contractor with the date, time, and place of the conference.

(b) The contractor shall begin work upon receipt of a written Notice to Proceed from the Contracting Officer or designee. The Contractor shall not begin work prior to receiving such notice.

6. Construction Progress Schedule

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring labor, materials, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments or take other remedies under the contract until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as required by the Contracting Officer, and immediately deliver three copies of the annotated schedule to the Contracting Officer. If the Contracting Officer determines, upon the basis of inspection conducted pursuant to the clause entitled Inspection and Acceptance of Construction, herein that the Contractor is not meeting the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the PHA. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the Contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the Default clause of this contract.

7. Site Investigation and Conditions Affecting the Work

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to, (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads;(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is

reasonably ascertainable from an inspection of the site, including all exploratory work done by the PHA, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the PHA.

(b) The PHA assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the PHA. Nor does the PHA assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

8. Differing Site Conditions

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of (1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or (2) unknown physical conditions at the site(s), of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. Work shall not proceed at the affected site, except at the Contractor's risk, until the Contracting Officer has provided written instructions to the Contractor. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, the Contractor shall file a claim in writing to the PHA within ten days after receipt of such instructions and, in any event, before proceeding with the work. An equitable adjustment in the contract price, the delivery schedule, or both shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

9. Specifications and Drawings for Construction

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the "direction", "requirement", "order", "designation", or "prescription", of the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean "approved by", or "acceptable to", or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown" "as indicated", "as detailed", or of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place" that is "furnished and installed".

(d) "Shop drawings" means drawings, submitted to the PHA by the Contractor, subcontractor, or any lower tier subcontractor, showing in detail (1) the proposed fabrication and assembly of structural elements and (2) the installation (i.e., form, fit, and attachment details) of materials of equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. The PHA may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with other contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the PHA's reasons therefore. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Architect approves any such variation and the Contracting Officer concurs, the Contracting Officer shall issue an appropriate modification to the contract, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) It shall be the responsibility of the Contractor to make timely requests of the PHA for such large scale and full size drawings, color schemes, and other additional information, not already in his possession, which shall be

required in the planning and production of the work. Such requests may be submitted as the need arises, but each such request shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay.

(h) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the PHA and one set will be returned to the Contractor. As required by the Contracting Officer, the Contractor, upon completing the work under this contract, shall furnish a complete set of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the work is completed and accepted.

(i) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all shop drawings prepared by subcontractors are submitted to the Contracting Officer.

10. As-Built Drawings

(a) "As-built drawings," as used in this clause, means drawings submitted by the Contractor or subcontractor at any tier to show the construction of a particular structure or work as actually completed under the contract. "As-built drawings" shall be synonymous with "Record drawings."

(b) As required by the Contracting Officer, the Contractor shall provide the Contracting Officer accurate information to be used in the preparation of permanent as-built drawings. For this purpose, the Contractor shall record on one set of contract drawings all changes from the installations originally indicated, and record final locations of underground lines by depth from finish grade and by accurate horizontal offset distances to permanent surface improvements such as buildings, curbs, or edges of walks.

(c) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all as-built drawings prepared by subcontractors are submitted to the Contracting Officer.

11. Material and Workmanship

(a) All equipment, material, and articles furnished under this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the contract to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of, and as approved by the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) Approval of equipment and materials.

(1) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

(2) When required by the specifications or the Contracting Officer, the Contractor shall submit appropriately marked samples (and certificates related to them) for approval at the Contractor's expense, with all shipping charges prepaid. The Contractor shall label, or otherwise properly mark on the container, the material or product represented, its place of origin, the name of the producer, the Contractor's name, and the identification of the construction project for which the material or product is intended to be used.

(3) Certificates shall be submitted in triplicate, describing each sample submitted for approval and certifying that the material, equipment or accessory complies with contract requirements. The certificates shall include the name and brand of the product, name of manufacturer, and the location where produced.

(4) Approval of a sample shall not constitute a waiver of the PHA right to demand full compliance with contract requirements. Materials, equipment and accessories may be rejected for cause even though samples have been approved.

(5) Wherever materials are required to comply with recognized standards or specifications, such specifications shall be accepted as establishing the technical qualities and testing methods, but shall not govern the number of tests required to be made nor modify other contract requirements. The Contracting Officer may require laboratory test reports on items submitted for approval or may approve materials on the basis of data submitted in certificates with samples. Check tests will be made on materials delivered for use only as frequently as the Contracting Officer determines necessary to insure compliance of materials with the specifications. The Contractor will assume all costs of retesting materials which fail to meet contract requirements and/or testing materials offered in substitution for those found deficient.

(6) After approval, samples will be kept in the Project office until completion of work. They may be built into the work after a substantial quantity of the materials they represent has been built in and accepted.

(c) Requirements concerning lead-based paint. The Contractor shall comply with the requirements concerning lead-based paint contained in the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4846) as implemented by 24 CFR Part 35.

12. Permits and Codes

(a) The Contractor shall give all notices and comply with all applicable laws, ordinances, codes, rules and regulations. Notwithstanding the requirement of the Contractor to comply with the drawings and specifications in the contract, all work installed shall comply with all applicable codes and regulations as amended by any

waivers. Before installing the work, the Contractor shall examine the drawings and the specifications for compliance with applicable codes and regulations bearing on the work and shall immediately report any discrepancy it may discover to the Contracting Officer. Where the requirements of the drawings and specifications fail to comply with the applicable code or regulation, the Contracting Officer shall modify the contract by change order pursuant to the clause entitled Changes herein to conform to the code or regulation.

(b) The Contractor shall secure and pay for all permits, fees, and licenses necessary for the proper execution and completion of the work. Where the PHA can arrange for the issuance of all or part of these permits, fees and licenses, without cost to the Contractor, the contract amount shall be reduced accordingly.

13. Health, Safety, and Accident Prevention

(a) In performing this contract, the Contractor shall:
(1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and/or safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation;
(2) Protect the lives, health, and safety of other persons;
(3) Prevent damage to property, materials, supplies, and equipment; and,
(4) Avoid work interruptions.

(b) For these purposes, the Contractor shall:
(1) Comply with regulations and standards issued by the Secretary of Labor at 29 CFR Part 1926. 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 U.S.C. 3701 et seq.; and
(2) Include the terms of this clause in every subcontract so that such terms will be binding on each subcontractor.

(c) The Contractor shall maintain an accurate record of exposure data on all accidents incident to work performed under this contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 CFR Part 1904.

(d) The Contracting Officer shall notify the Contractor of any noncompliance with these requirements and of the corrective action required. This notice, when delivered to the Contractor or the Contractor's representative at the site of the work, shall be deemed sufficient notice of the noncompliance and corrective action required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to take corrective action promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances.

(e) The Contractor shall be responsible for its subcontractors' compliance with the provisions of this clause. The Contractor shall take such action with respect to any subcontract as the PHA, the Secretary of Housing and Urban Development, or the Secretary of Labor shall direct as a means of enforcing such provisions.

14. Temporary Heating

The Contractor shall provide and pay for temporary heating, covering, and enclosures necessary to properly protect all work and materials against damage by dampness and cold, to dry out the work, and to facilitate the completion of the work. Any permanent heating equipment used shall be turned over to the PHA in the condition and at the time required by the specifications.

15. Availability and Use of Utility Services

(a) The PHA shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the PHA or, where the utility is produced by the PHA, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the PHA, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

16. Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed under this contract, and which do not unreasonably interfere with the work required under this contract.

(b) The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during performance of this contract, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

(c) The Contractor shall protect from damage all existing improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. Prior to disturbing the ground at the construction site, the Contractor shall ensure that all underground utility lines are clearly marked.

(d) The Contractor shall shore up, brace, underpin, secure, and protect as necessary all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be affected by the excavations or other operations connected with the construction of the project.

(e) Any equipment temporarily removed as a result of work under this contract shall be protected, cleaned, and replaced in the same condition as at the time of award of this contract.

(f) New work which connects to existing work shall correspond in all respects with that to which it connects and/or be similar to existing work unless otherwise required by the specifications.
(g) No structural members shall be altered or in any way weakened without the written authorization of the Contracting Officer, unless such work is clearly specified in the plans or specifications.
(h) If the removal of the existing work exposes discolored or unfinished surfaces, or work out of alignment, such surfaces shall be refinished, or the material replaced as necessary to make the continuous work uniform and harmonious. This, however, shall not be construed to require the refinishing or reconstruction of dissimilar finishes previously exposed, or finished surfaces in good condition, but in different planes or on different levels when brought together by the removal of intervening work, unless such refinishing or reconstruction is specified in the plans or specifications.
(i) The Contractor shall give all required notices to any adjoining or adjacent property owner or other party before the commencement of any work.
(j) The Contractor shall indemnify and save harmless the PHA from any damages on account of settlement or the loss of lateral support of adjoining property, any damages from changes in topography affecting drainage, and from all loss or expense and all damages for which the PHA may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.
(k) The Contractor shall repair any damage to vegetation, structures, equipment, utilities, or improvements, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

17. Temporary Buildings and Transportation of Materials

(a) Temporary buildings (e.g., storage sheds, shops, offices, sanitary facilities) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the PHA. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
(b) The Contractor shall, as directed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any federal, state, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

18. Clean Air and Water

The contactor shall comply with the Clean Air Act, as amended, 42 USC 7401 et seq., the Federal Water Pollution Control Water Act, as amended, 33 U.S.C. 1251 et seq., and standards issued pursuant thereto in the facilities in which this contract is to be performed.

19. Energy Efficiency

The Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub.L. 94-163) for the State in which the work under the contract is performed.

20. Inspection and Acceptance of Construction

(a) Definitions. As used in this clause -
(1) "Acceptance" means the act of an authorized representative of the PHA by which the PHA approves and assumes ownership of the work performed under this contract. Acceptance may be partial or complete.
(2) "Inspection" means examining and testing the work performed under the contract (including, when appropriate, raw materials, equipment, components, and intermediate assemblies) to determine whether it conforms to contract requirements.
(3) "Testing" means that element of inspection that determines the properties or elements, including functional operation of materials, equipment, or their components, by the application of established scientific principles and procedures.
(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. All work is subject to PHA inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.
(c) PHA inspections and tests are for the sole benefit of the PHA and do not: (1) relieve the Contractor of responsibility for providing adequate quality control measures; (2) relieve the Contractor of responsibility for loss or damage of the material before acceptance; (3) constitute or imply acceptance; or, (4) affect the continuing rights of the PHA after acceptance of the completed work under paragraph (j) below.
(d) The presence or absence of the PHA inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specifications without the Contracting Officer's written authorization. All instructions and approvals with respect to the work shall be given to the Contractor by the Contracting Officer.
(e) The Contractor shall promptly furnish, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The PHA may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The PHA shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

(f) The PHA may conduct routine inspections of the construction site on a daily basis.

(g) The Contractor shall, without charge, replace or correct work found by the PHA not to conform to contract requirements, unless the PHA decides that it is in its interest to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(h) If the Contractor does not promptly replace or correct rejected work, the PHA may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor, or (2) terminate for default the Contractor's right to proceed.

(i) If any work requiring inspection is covered up without approval of the PHA, it must, if requested by the Contracting Officer, be uncovered at the expense of the Contractor. If at any time before final acceptance of the entire work, the PHA considers it necessary or advisable, to examine work already completed by removing or tearing it out, the Contractor, shall on request, promptly furnish all necessary facilities, labor, and material. If such work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray all the expenses of the examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the Contracting Officer shall make an equitable adjustment to cover the cost of the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(j) The Contractor shall notify the Contracting Officer, in writing, as to the date when in its opinion all or a designated portion of the work will be substantially completed and ready for inspection. If the Architect determines that the state of preparedness is as represented, the PHA will promptly arrange for the inspection. Unless otherwise specified in the contract, the PHA shall accept, as soon as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines and designates can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the PHA's right under any warranty or guarantee.

21. Use and Possession Prior to Completion

(a) The PHA shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the PHA intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The PHA's possession or use shall not be deemed an acceptance of any work under the contract.

(b) While the PHA has such possession or use, the Contractor shall be relieved of the responsibility for (1) the loss of or damage to the work resulting from the PHA's possession or use, notwithstanding the terms of the clause entitled Permits and Codes herein; (2) all maintenance costs on the areas occupied; and, (3) furnishing heat, light, power, and water used in the areas occupied without proper remuneration therefore. If prior possession or use by the PHA delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

22. Warranty of Title

The Contractor warrants good title to all materials, supplies, and equipment incorporated in the work and agrees to deliver the premises together with all improvements thereon free from any claims, liens or charges, and agrees further that neither it nor any other person, firm or corporation shall have any right to a lien upon the premises or anything appurtenant thereto.

23. Warranty of Construction

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (j) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall continue for a period of 2 years (one year unless otherwise indicated) from the date of final acceptance of the work. If the PHA takes possession of any part of the work before final acceptance, this warranty shall continue for a period of (one year unless otherwise indicated) from the date that the PHA takes possession.

(b) The Contractor shall remedy, at the Contractor's expense, any failure to conform, or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to PHA-owned or controlled real or personal property when the damage is the result of—
(1) The Contractor's failure to conform to contract requirements; or
(2) Any defects of equipment, material, workmanship or design furnished by the Contractor.

(c) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for (one year unless otherwise indicated) from the date of repair or replacement.

(d) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect or damage.

(e) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the PHA shall have the right to replace, repair or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(f) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:
(1) Obtain all warranties that would be given in normal commercial practice;
(2) Require all warranties to be executed in writing, for the benefit of the PHA; and,
(3) Enforce all warranties for the benefit of the PHA.

(g) In the event the Contractor's warranty under paragraph (a) of this clause has expired, the PHA may bring suit at its own expense to enforce a subcontractor's, manufacturer's or supplier's warranty.

(h) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defect of material or design furnished by the PHA nor for the repair of any damage that results from any defect in PHA furnished material or design.
(i) Notwithstanding any provisions herein to the contrary, the establishment of the time periods in paragraphs (a) and (c) above relate only to the specific obligation of the Contractor to correct the work, and have no relationship to the time within which its obligation to comply with the contract may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to its obligation other than specifically to correct the work.
(j) This warranty shall not limit the PHA's rights under the Inspection and Acceptance of Construction clause of this contract with respect to latent defects, gross mistakes or fraud.

24. Prohibition Against Liens

The Contractor is prohibited from placing a lien on the PHA's property. This prohibition shall apply to all subcontractors at any tier and all materials suppliers.

Administrative Requirements

25. Contract Period

this contract within calendar days of the effective date of the contract, or within the time schedule established in the notice to proceed issued by the Contracting Officer.

26. Order of Provisions

In the event of a conflict between these General Conditions and the Specifications, the General Conditions shall prevail. In the event of a conflict between the contract and any applicable state or local law or regulation, the state or local law or regulation shall prevail; provided that such state or local law or regulation does not conflict with, or is less restrictive than applicable federal law, regulation, or Executive Order. In the event of such a conflict, applicable federal law, regulation, and Executive Order shall prevail.

27. Payments

(a) The PHA shall pay the Contractor the price as provided in this contract.
(b) The PHA shall make progress payments approximately every 30 days as the work proceeds, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer. The PHA may, subject to written determination and approval of the Contracting Officer, make more frequent payments to contractors which are qualified small businesses.
(c) Before the first progress payment under this contract, the Contractor shall furnish, in such detail as requested by the Contracting Officer, a breakdown of the total contract price showing the amount included therein for each principal category of the work, which shall substantiate the payment amount requested in order to provide a basis for determining progress payments. The breakdown shall be approved by the Contracting Officer and must be acceptable to HUD. If the contract covers more than one project, the Contractor shall furnish a separate breakdown for each. The values and quantities employed in making up this breakdown are for determining the amount of progress payments and shall not be construed as a basis for additions to or deductions from the contract price. The Contractor shall prorate its overhead and profit over the construction period of the contract.
(d) The Contractor shall submit, on forms provided by the PHA, periodic estimates showing the value of the work performed during each period based upon the approved

submitted not later than 30 days in advance of the date set for payment and are subject to correction and revision as required. The estimates must be approved by the Contracting Officer with the concurrence of the Architect prior to payment. If the contract covers more than one project, the Contractor shall furnish a separate progress payment estimate for each.
(e) Along with each request for progress payments and the required estimates, the Contractor shall furnish the following certification, or payment shall not be made: I hereby certify, to the best of my knowledge and belief, that:
(1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;
(2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements; and,
(3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract.

_____
Name:

_____
Title:

_____
Date:

(f) Except as otherwise provided in State law, the PHA shall retain ten (10) percent of the amount of progress payments until completion and acceptance of all work under the contract; except, that if upon completion of 50 percent of the work, the Contracting Officer, after consulting with the Architect, determines that the Contractor's performance and progress are satisfactory, the PHA may make the remaining payments in full for the work subsequently completed. If the Contracting Officer subsequently determines that the Contractor's performance and progress are unsatisfactory, the PHA shall reinstate the ten (10) percent (or other percentage as provided in State law) retainage until such time as the Contracting Officer determines that performance and progress are satisfactory.
(g) The Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration when computing progress payments.

Material delivered to the Contractor at locations other than the site may also be taken into consideration if the Contractor furnishes satisfactory evidence that (1) it has acquired title to such material; (2) the material is properly stored in a bonded warehouse, storage yard, or similar suitable place as may be approved by the Contracting Officer; (3) the material is insured to cover its full value; and (4) the material will be used to perform this contract. Before any progress payment which includes delivered material is made, the Contractor shall furnish such documentation as the Contracting Officer may require to assure the protection of the PHA's interest in such materials. The Contractor shall remain responsible for such stored material notwithstanding the transfer of title to the PHA.

(h) All material and work covered by progress payments made shall, at the time of payment become the sole property of the PHA, but this shall not be construed as (1) relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or, (2) waiving the right of the PHA to require the fulfillment of all of the terms of the contract. In the event the work of the Contractor has been damaged by other contractors or persons other than employees of the PHA in the course of their employment, the Contractor shall restore such damaged work without cost to the PHA and to seek redress for its damage only from those who directly caused it.

(i) The PHA shall make the final payment due the Contractor under this contract after (1) completion and final acceptance of all work; and (2) presentation of release of all claims against the PHA arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. Each such exception shall embrace no more than one claim, the basis and scope of which shall be clearly defined. The amounts for such excepted claims shall not be included in the request for final payment. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned.

(j) Prior to making any payment, the Contracting Officer may require the Contractor to furnish receipts or other evidence of payment from all persons performing work and supplying material to the Contractor, if the Contracting Officer determines such evidence is necessary to substantiate claimed costs.

(k) The PHA shall not; (1) determine or adjust any claims for payment or disputes arising there under between the Contractor and its subcontractors or material suppliers; or, (2) withhold any moneys for the protection of the subcontractors or material suppliers. The failure or refusal of the PHA to withhold moneys from the Contractor shall in nowise impair the obligations of any surety or sureties under any bonds furnished under this contract.

28. Contract Modifications

(a) Only the Contracting Officer has authority to modify any term or condition of this contract. Any contract modification shall be authorized in writing.

(b) The Contracting Officer may modify the contract unilaterally (1) pursuant to a specific authorization stated in a contract clause (e.g., Changes); or (2) for administrative matters which do not change the rights or responsibilities of the parties (e.g., change in the PHA address). All other contract modifications shall be in the form of supplemental agreements signed by the Contractor and the Contracting Officer.

(c) When a proposed modification requires the approval of HUD prior to its issuance (e.g., a change order that exceeds the PHA's approved threshold), such modification shall not be effective until the required approval is received by the PHA.

29. Changes

(a) The Contracting Officer may, at any time, without notice to the sureties, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract including changes:
(1) In the specifications (including drawings and designs);
(2) In the method or manner of performance of the work;
(3) PHA-furnished facilities, equipment, materials, services, or site; or,
(4) Directing the acceleration in the performance of the work.

(b) Any other written order or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating (1) the date, circumstances and source of the order and (2) that the Contractor regards the order as a change order.

(c) Except as provided in this clause, no order, statement or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for a adjustment based on defective specifications, no proposal for any change under paragraph (b) above shall be allowed for any costs incurred more than 20 days (5 days for oral orders) before the Contractor gives written notice as required. In the case of defective specifications for which the PHA is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after (1) receipt of a written change order under paragraph (a) of this clause, or (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting a written statement describing the general nature and the amount of the proposal. If the facts justify it, the Contracting Officer may extend the period for submission. The proposal may be included in the notice required under paragraph (b) above. No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

(f) The Contractor's written proposal for equitable adjustment shall be submitted in the form of a lump sum proposal supported with an itemized breakdown of all increases and decreases in the contract in at least the following details:

(1) Direct Costs. Materials (list individual items, the quantity and unit cost of each, and the aggregate cost); Transportation and delivery costs associated with materials; Labor breakdowns by hours or unit costs (identified with specific work to be performed); Construction equipment exclusively necessary for the change; Costs of preparation and/ or revision to shop drawings resulting from the change; Worker's Compensation and Public Liability Insurance; Employment taxes under FICA and FUTA; and, Bond Costs when size of change warrants revision.

(2) Indirect Costs. Indirect costs may include overhead, general and administrative expenses, and fringe benefits not normally treated as direct costs.

(3) Profit. The amount of profit shall be negotiated and may vary according to the nature, extent, and complexity of the work required by the change. The allowability of the direct and indirect costs shall be determined in accordance with the Contract Cost Principles and Procedures for Commercial Firms in Part 31 of the Federal Acquisition Regulation (48 CFR 1-31), as implemented by HUD Handbook 2210.18, in effect on the date of this contract. The Contractor shall not be allowed a profit on the profit received by any subcontractor. Equitable adjustments for deleted work shall include a credit for profit and may include a credit for indirect costs. On proposals covering both increases and decreases in the amount of the contract, the application of indirect costs and profit shall be on the net-change in direct costs for the Contractor or subcontractor performing the work.

(g) The Contractor shall include in the proposal its request for time extension (if any), and shall include sufficient information and dates to demonstrate whether and to what extent the change will delay the completion of the contract in its entirety.

(h) The Contracting Officer shall act on proposals within 30 days after their receipt, or notify the Contractor of the date when such action will be taken.

(i) Failure to reach an agreement on any proposal shall be a dispute under the clause entitled Disputes herein. Nothing in this clause, however, shall excuse the Contractor from proceeding with the contract as changed.

(j) Except in an emergency endangering life or property, no change shall be made by the Contractor without a prior order from the Contracting Officer.

30. Suspension of Work

(a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the PHA.

(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified (or within a reasonable time if not specified) in this contract an adjustment shall be made for any increase in the cost of performance of the contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor or for which any equitable adjustment is provided for or excluded under any other provision of this contract.

(c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order); and, (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

31. Disputes

(a) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to the contract. A claim arising under the contract, unlike a claim relating to the contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim. The submission may be converted to a claim by complying with the requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(b) Except for disputes arising under the clauses entitled Labor Standards - Davis Bacon and Related Acts, herein, all disputes arising under or relating to this contract, including any claims for damages for the alleged breach thereof which are not disposed of by agreement, shall be resolved under this clause.

(c) All claims by the Contractor shall be made in writing and submitted to the Contracting Officer for a written decision. A claim by the PHA against the Contractor shall be subject to a written decision by the Contracting Officer.

(d) The Contracting Officer shall, within 60 (unless otherwise indicated) days after receipt of the request, decide the claim or notify the Contractor of the date by which the decision will be made.

(e) The Contracting Officer's decision shall be final unless the Contractor (1) appeals in writing to a higher level in the PHA in accordance with the PHA's policy and procedures, (2) refers the appeal to an independent mediator or arbitrator, or (3) files suit in a court of competent jurisdiction. Such appeal must be made within (30 unless otherwise indicated) days after receipt of the Contracting Officer's decision.

(f) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer.

32. Default

(a) If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with the diligence that will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within this time, the Contracting Officer may, by written notice to the Contractor, terminate the right to

proceed with the work (or separable part of the work) that has been delayed. In this event, the PHA may take over the work and complete it, by contract or otherwise, and may take possession of and use any materials, equipment, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the PHA resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the PHA in completing the work.

(b) The Contractor's right to proceed shall not be terminated or the Contractor charged with damages under this clause if—

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include (i) acts of God, or of the public enemy, (ii) acts of the PHA or other governmental entity in either its sovereign or contractual capacity, (iii) acts of another contractor in the performance of a contract with the PHA, (iv) fires, (v) floods, (vi) epidemics, (vii) quarantine restrictions, (viii) strikes, (ix) freight embargoes, (x) unusually severe weather, or (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within days (10 days unless otherwise indicated) from the beginning of such delay (unless extended by the Contracting Officer) notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of the delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, time for completing the work shall be extended by written modification to the contract. The findings of the Contracting Officer shall be reduced to a written decision which shall be subject to the provisions of the Disputes clause of this contract.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been for convenience of the PHA.

33. Liquidated Damages

(a) If the Contractor fails to complete the work within the time specified in the contract, or any extension, as specified in the clause entitled Default of this contract, the Contractor shall pay to the PHA as liquidated damages, the sum of $_____Contracting Officer insert amount] for each day of delay. If different completion dates are specified in the contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another clause in this contract, liquidated damages shall not be due the PHA. The Contractor remains liable for damages caused other than by delay.

(b) If the PHA terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the PHA in completing the work.

(c) If the PHA does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

34. Termination for Convenience

(a) The Contracting Officer may terminate this contract in whole, or in part, whenever the Contracting Officer determines that such termination is in the best interest of the PHA. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which the performance of the work under the contract is terminated, and the date upon which such termination becomes effective.

(b) If the performance of the work is terminated, either in whole or in part, the PHA shall be liable to the Contractor for reasonable and proper costs resulting from such termination upon the receipt by the PHA of a properly presented claim setting out in detail: (1) the total cost of the work performed to date of termination less the total amount of contract payments made to the Contractor; (2) the cost (including reasonable profit) of settling and paying claims under subcontracts and material orders for work performed and materials and supplies delivered to the site, payment for which has not been made by the PHA to the Contractor or by the Contractor to the subcontractor or supplier; (3) the cost of preserving and protecting the work already performed until the PHA or assignee takes possession thereof or assumes responsibility therefore; (4) the actual or estimated cost of legal and accounting services reasonably necessary to prepare and present the termination claim to the PHA; and (5) an amount constituting a reasonable profit on the value of the work performed by the Contractor.

(c) The Contracting Officer will act on the Contractor's claim within days (60 days unless otherwise indicated) of receipt of the Contractor's claim.

(d) Any disputes with regard to this clause are expressly made subject to the provisions of the Disputes clause of this contract.

35. Assignment of Contract

The Contractor shall not assign or transfer any interest in this contract; except that claims for monies due or to become due from the PHA under the contract may be assigned to a bank, trust company, or other financial institution. Such assignments of claims shall only be made with the written concurrence of the Contracting Officer. If the Contractor is a partnership, this contract shall inure to the benefit of the surviving or remaining member(s) of such partnership as approved by the Contracting Officer.

36. Insurance

(a) Before commencing work, the Contractor and each subcontractor shall furnish the PHA with certificates of insurance showing the following insurance is in force and will insure all operations under the Contract:

(1) Workers' Compensation, in accordance with state or Territorial Workers' Compensation laws.

(2) Commercial General Liability with a combined single limit for bodily injury and property damage of not less than $2MM [Contracting Officer insert amount]

per occurrence to protect the Contractor and each subcontractor against claims for bodily injury or death and damage to the property of others. This shall cover the use of all equipment, hoists, and vehicles on the site(s) not covered by Automobile Liability under (3) below. If the Contractor has a "claims made" policy, then the following additional requirements apply: the policy must provide a "retroactive date" which must be on or before the execution date of the Contract; and the extended reporting period may not be less than five years following the completion date of the Contract.

(3) Automobile Liability on owned and non -owned motor vehicles used on the site(s) or in connection therewith for a combined single limit for bodily injury and property damage of not less than $ 500K [Contracting Officer insert amount] per occurrence.

(b) Before commencing work, the Contractor shall furnish the PHA with a certificate of insurance evidencing that Builder's Risk (fire and extended coverage) Insurance on all work in place and/or materials stored at the building site(s), including foundations and building equipment, is in force. The Builder's Risk Insurance shall be for the benefit of the Contractor and the PHA as their interests may appear and each shall be named in the policy or policies as an insured. The Contractor in installing equipment supplied by the PHA shall carry insurance on such equipment from the time the Contractor takes possession thereof until the Contract work is accepted by the PHA. The Builder's Risk Insurance need not be carried on excavations, piers, footings, or foundations until such time as work on the superstructure is started. It need not be carried on landscape work. Policies shall furnish coverage at all times for the full cash value of all completed construction, as well as materials in place and/or stored at the site(s), whether or not partial payment has been made by the PHA. The Contractor may terminate this insurance on buildings as of the date taken over for occupancy by the PHA. The Contractor is not required to carry Builder's Risk Insurance for modernization work which does not involve structural alterations or additions and where the PHA's existing fire and extended coverage policy can be endorsed to include such work.

(c) All insurance shall be carried with companies which are financially responsible and admitted to do business in the State in which the project is located. If any such insurance is due to expire during the construction period, the Contractor (including subcontractors, as applicable) shall not permit the coverage to lapse and shall furnish evidence of coverage to the Contracting Officer. All certificates of insurance, as evidence of coverage, shall provide that no coverage may be canceled or non-renewed by the insurance company until at least 30 days prior written notice has been given to the Contracting Officer.

37. Subcontracts

(a) Definitions. As used in this contract -

(1) "Subcontract" means any contract, purchase order, or other purchase agreement, including modifications and change orders to the foregoing, entered into by a subcontractor to furnish supplies, materials, equipment, and services for the performance of the prime contract or a subcontract.

(2) "Subcontractor" means any supplier, vendor, or firm that furnishes supplies, materials, equipment, or services to or for the Contractor or another subcontractor.

(b) The Contractor shall not enter into any subcontract with any subcontractor who has been temporarily denied participation in a HUD program or who has been suspended or debarred from participating in contracting programs by any agency of the United States Government or of the state in which the work under this contract is to be performed.

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

(d) The Contractor shall insert appropriate clauses in all subcontracts to bind subcontractors to the terms and conditions of this contract insofar as they are applicable to the work of subcontractors.

(e) Nothing contained in this contract shall create any contractual relationship between any subcontractor and the PHA or between the subcontractor and HUD.

38. Subcontracting with Small and Minority Firms, Women's Business Enterprise, and Labor Surplus Area Firms

The Contractor shall take the following steps to ensure that, whenever possible, subcontracts are awarded to small business firms, minority firms, women's business enterprises, and labor surplus area firms:

(a) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

(b) Ensuring that small and minority businesses and women's business enterprises are solicited whenever they are potential sources;

(c) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;

(d) Establishing delivery schedules, where the requirements of the contract permit, which encourage participation by small and minority businesses and women's business enterprises; and

(e) Using the services and assistance of the U.S. Small Business Administration, the Minority Business Development Agency of the U.S. Department of Commerce, and State and local governmental small business agencies.

39. Equal Employment Opportunity

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

(a) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, or handicap.

(b) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, national origin, or handicap. Such action shall include, but not be limited to, (1) employment, (2) upgrading, (3) demotion, (4) transfer, (5) recruitment or recruitment advertising, (6) layoff or termination, (7) rates of pay or other forms of compensation, and (8) selection for training, including apprenticeship.

(c) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(d) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, or handicap.

(e) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(f) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(g) The Contractor shall furnish all information and reports required by Executive Order 11246, as amended, Section 503 of the Rehabilitation Act of 1973, as amended, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto. The Contractor shall permit access to its books, records, and accounts by the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(h) In the event of a determination that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, 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 under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended, the rules, regulations, and orders of the Secretary of Labor, or as otherwise provided by law.

(i) The Contractor shall include the terms and conditions of this clause in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor. The Contractor shall take such action with respect to any subcontract or purchase order as the Secretary of Housing and Urban Development or the Secretary of Labor may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(j) Compliance with the requirements of this clause shall be to the maximum extent consistent with, but not in derogation of, compliance with section 7(b) of the Indian Self-Determination and Education Assistance Act and the Indian Preference clause of this contract.

40. Employment, Training, and Contracting Opportunities for Low-Income Persons, Section 3 of the Housing and Urban Development Act of 1968.

(a) The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development 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).

41. Interest of Members of Congress

No member of or delegate to the Congress of the United States of America shall be admitted to any share or part of this contract or to any benefit that may arise therefrom.

42. Interest of Members, Officers, or Employees and Former Members, Officers, or Employees

No member, officer, or employee of the PHA, no member of the governing body of the locality in which the project is situated, no member of the governing body of the locality in which the PHA was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the project, shall, during his or her tenure, or for one year thereafter, have any interest, direct or indirect, in this contract or the proceeds thereof.

43. Limitations on Payments made to Influence Certain Federal Financial Transactions

(a) The Contractor agrees to comply with Section 1352 of Title 31, United States Code which prohibits the use of Federal appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: 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; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(b) The Contractor further agrees to comply with the requirement of the Act to furnish a disclosure (OMB Standard Form LLL, Disclosure of Lobbying Activities) if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) 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 a Federal contract, grant, loan, or cooperative agreement.

44. Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringement of any patent rights and shall save the PHA harmless from loss on account thereof; except that the PHA shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified and the Contractor has no reason to believe that the specified design, process, or product is an infringement. If, however, the Contractor has reason to believe that any design, process or product specified is an infringement of a patent, the Contractor shall promptly notify the Contracting Officer. Failure to give such notice shall make the Contractor responsible for resultant loss.

45. Examination and Retention of Contractor's Records

(a) The PHA, HUD, or Comptroller General of the United States, or any of their duly authorized representatives shall, until 3 years after final payment under this contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

(b) The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as paragraph (a) above. "Subcontract," as used in this clause, excludes purchase orders not exceeding $10,000.

(c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under the Disputes clause of this contract, (2) litigation or settlement of claims arising from the performance of this contract, or (3) costs and expenses of this contract to which the PHA, HUD, or Comptroller General or any of their duly authorized representatives has taken exception shall continue until disposition of such appeals, litigation, claims, or exceptions.

46. Labor Standards - Davis-Bacon and Related Acts

If the total amount of this contract exceeds $2,000, the Federal labor standards set forth in the clause below shall apply to the development or construction work to be performed under the contract.

(a) Minimum Wages.

(1) All laborers and mechanics employed under this contract in the development or construction of the project(s) involved 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 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 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 regular 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 in 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.

(2) (i) Any class of laborers or mechanics, including helpers, 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 all the following criteria have been met: (A) The work to be performed by the classification requested is not performed by a classification in the wage determination; and (B) The classification is utilized in the area by the construction industry; and (C) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(ii) 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, Employee Standards Administration, U.S. Department of Labor, Washington, DC 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.

(iii) 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 of the Wage and Hour Division 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.

(iv) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (a)(2)(ii) or (iii) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in classification.

(3) 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.

(4) 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.

(b) Withholding of funds. 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 in the construction or development of the project, all or part of the wages required by the contract, HUD or its designee may, after written notice to the Contractor, 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.

(c) Payrolls and basic records.

(1) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working in the construction or development of the project. 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 1(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 costs reasonably anticipated in providing benefits under a plan or program described in section 1(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.

(2) (i) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer 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 subparagraph (c)(1) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The Contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1214-0149.)

(ii) 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:

(A) That the payroll for the payroll period contains the information required to be maintained under paragraph (c) (1) of this clause and that such information is correct and complete;

(B) 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; and

(C) 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.

(iii) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirements for submission of the "Statement of Compliance" required by subparagraph (c)(2)(ii) of this clause.

(iv) 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 3729 of Title 31 of the United States Code.

(3) The Contractor or subcontractor shall make the records required under subparagraph (c)(1) available for inspection, copying, or transcription by authorized representatives of HUD or its designee, the Contracting Officer, 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, 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.

(d) (1) 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 and Training, Employer and Labor Services (OATELS), or with a State Apprenticeship Agency recognized by OATELS, 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 OATELS 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 in this paragraph, 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 journeyman 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 of the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event OATELS, or a State Apprenticeship Agency recognized by OATELS, 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.

(2) 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 in 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 in 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 in the wage determination for the classification of 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 in 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.

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

(e) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.

(f) Contract termination; debarment. A breach of this contract clause may be grounds for termination of the contract and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.

(g) 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.

(h) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this clause 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 the PHA, HUD, the U.S. Department of Labor, or the employees or their representatives.

(i) Certification of eligibility.

(1) 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 contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(2) No part of this contract shall be subcontracted to any person or firm ineligible for award of a United States Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

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

(j) Contract Work Hours and Safety Standards Act. 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, including watchmen and guards, 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 provisions set forth in subparagraph (j)(1) of this clause, 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 provisions set forth in subparagraph (j)(1) of this clause, 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 provisions set forth in subparagraph (j)(1) of this clause.

(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 Federal contract with the same prime Contractor, 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 provisions set forth in subparagraph (j)(2) of this clause.

(k) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts all the provisions contained in this clause, and such other clauses as HUD or its designee may by appropriate instructions require, and also a clause requiring the subcontractors to include these provisions in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all these provisions.

47. Non-Federal Prevailing Wage Rates

(a) Any prevailing wage rate (including basic hourly rate and any fringe benefits), determined under State or tribal law to be prevailing, with respect to any employee in any trade or position employed under the contract, is inapplicable to the contract and shall not be enforced against the Contractor or any subcontractor, with respect to employees engaged under the contract whenever such non-Federal prevailing wage rate exceeds:
(1) The applicable wage rate determined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 U.S.C. 3141 et seq.) to be prevailing in the locality with respect to such trade;
(b) An applicable apprentice wage rate based thereon specified in an apprenticeship program registered with the U.S. Department of Labor (DOL) or a DOL-recognized State Apprenticeship Agency; or
(c) An applicable trainee wage rate based thereon specified in a DOL-certified trainee program.

48. Procurement of Recovered Materials.

(a) In accordance with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, the Contractor shall procure 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. The Contractor shall procure items designated in the EPA guidelines that contain the highest percentage of recovered materials practicable unless the Contractor determines that such items: (1) are not reasonably available in a reasonable period of time; (2) fail to meet reasonable performance standards, which shall be determined on the basis of the guidelines of the National Institute of Standards and Technology, if applicable to the item; or (3) are only available at an unreasonable price.
(b) Paragraph (a) of this clause shall apply to items purchased under this contract where: (1) the Contractor purchases in excess of $10,000 of the item under this contract; or (2) during the preceding Federal fiscal year, the Contractor: (i) purchased any amount of the items for use under a contract that was funded with Federal appropriations and was with a Federal agency or a State agency or agency of a political subdivision of a State; and (ii) purchased a total of in excess of $10,000 of the item both under and outside that contract.

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information is being disclosed.**

_____

Name of Officer

4 **Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.**

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

5 **Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.**

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

_____ _____

Signature of vendor doing business with the governmental entity Date

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

***

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

Complete Nos. 1 - 4 and 6 if there are interested parties. Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.	**OFFICE USE ONLY**

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the goods or services to be provided under the contract.

4 Name of Interested Party	City, State, Country (place of business)	Nature of Interest (check applicable)	
		Controlling	Intermediary
DO NOT COMPLETE. COMPLTETED BY AWARDED CONTRACTOR ONLY.			

5 Check only if there is NO Interested Party. ☐

6 AFFIDAVIT

I swear, or affirm, under penalty of perjury, that the above disclosure is true and correct.

_____
Signature of authorized agent of contracting business entity

AFFIX NOTARY STAMP / SEAL ABOVE

Sworn to and subscribed before me, by the said _____, this the _____ day of _____, 20 _____ , to certify which, witness my hand and seal of office.

_____ _____ _____
Signature of officer administering oath | Printed name of officer administering oath | Title of officer administering oath

ADD ADDITIONAL PAGES AS NECESSARY

U.S. Department of Labor
Employment Standards Administration
Wage and Hour Division

PAYROLL

(For Contractor's Optional Use; See Instructions at www.dol.gov/esa/whd/forms/wh347instr.htm)

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.

U.S. Wage and Hour Division

Rev. Dec. 2008

OMB No.: 1215-0149
Expires: 12/31/2011

NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐	ADDRESS	
PAYROLL NO.	FOR WEEK ENDING	PROJECT AND LOCATION / PROJECT OR CONTRACT NO.

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	OT. OR ST.	(4) DAY AND DATE — HOURS WORKED EACH DAY	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS: FICA	WITH-HOLDING TAX			OTHER	TOTAL DEDUCTIONS	(9) NET WAGES PAID FOR WEEK
			O											
			S											
			O											
			S											
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that is will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, ESA, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

Date _____

I, _____ _____
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

_____ on the
(Contractor or Subcontractor)

_____; that during the payroll period commencing on the
(Building or Work)

_____ day of _____, _____, and ending the _____ day of _____, _____,

all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Start. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

_____

_____

_____

_____

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.

ATTACHMENT C
Profile of Firm Form
Company Biography
Subcontractor Listing

PROFILE OF FIRM FORM (Page 1 of 2)

(1) Prime ____ Joint Venture/Partner____ Sub-contractor _____ (This form shall be completed by and for each).

(2) Legal Name of Firm:_____

dba if applicable: _____

Telephone:_____ Fax: _____

Street Address, City, State, Zip:_____

(3) Identify Principals/Partners in Firm

NAME	*TITLE*	% OF OWNERSHIP

(4) Please indicate the operating structure of your company.

☐ Publicly Held Corporation ☐ Privately Held Corporation ☐ Government Agency ☐ Non-Profit Organization ☐ Partnership ☐ Sole Proprietorship

(5) Respondent's Diversity Statement: You must check all of the following that apply to the ownership of this firm and enter where provided the correct percentage (%) of ownership of each:

Minority- (MBE), or Woman-Owned (WBE) Business Enterprises qualify by virtue of 51% or more ownership and active management by one or more of the following:

☐African American ☐ Native American ☐Hispanic American ☐Asian/Pacific American ☐Hasidic Jew ☐Asian/Indian American

_____% _____% _____% _____% _____% _____%

☐Woman-Owned (MBE) ☐Woman-Owned (Caucasian) ☐Disabled Veteran ☐ Caucasian American (Male) ☐Other (Specify):

_____% _____% _____% _____% _____%

(6) Is the business 51% or more owned by a public housing resident? ___ Yes; ___ No. If yes, provide name and address of the public housing facility:

Facility Name:_____

Facility Address:_____ City:_____

(7) SWMBE Certification Number: _____

Certification Agency: _____
(NOTE: A CERTIFICATION/NUMBER IS NOT REQUIRED – ENTER IF AVAILABLE)

(8) Federal Tax ID Number: _____

(9) City of San Antonio Business License No.:_____

(10) State of Texas License Type and No.: _____

PROFILE OF FIRM FORM (Page 2 of 2)

(11) Has your firm or any member of your firm been a party to litigation with a public entity? If yes, when, with whom and state the circumstances and any resolution.

(12) Has your firm or any member of your firm ever sued or been sued by the San Antonio Housing Authority or its affiliated entities? If yes, when and state the circumstances and any resolution of the lawsuit.

(13) Has your firm or any member of your firm ever had a claim brought against because of breach of contract or nonperformance? If yes, when and state the circumstances and any resolution of the matter.

(14) Debarred Statement: Has this firm, or any principal(s) ever been debarred from providing any services by the Federal Government, any state government, the State of Texas, or any local government agency within or without the State of Texas? Yes ☐ No ☐

Initials_____

If "Yes," please attach a full detailed explanation, including dates, circumstances and current status.

(15) Disclosure Statement: Does this firm or any principals thereof have any current, past personal or professional relationship with any Commissioner or Officer of SAHA? Yes ☐ No ☐

Initials_____

If "Yes," please attach a full detailed explanation, including dates, circumstances and current status.

(16) Verification Statement: The undersigned Offerer hereby states that by completing and submitting this form he/she is verifying that all information provided herein is, to the best of his/her knowledge, true and accurate, and agrees that if the SAHA discovers that any information entered herein is false, that shall entitle the SAHA to not consider nor make award or to cancel any award with the undersigned party.

Initials_____

(17) In performing this contract, the contractor(s) shall comply with any and all applicable federal, state or local laws including but not limited to: Occupational Safety & Health, Equal Employment Opportunity, Immigration and Naturalization, The Americans with Disabilities Act, State Tax and Insurance Law, and the Fair Housing Act.

Initials_____

_____	_____	_____	_____
Signature	**Date**	**Printed Name**	**Company**

Company Biography

Company Name:_____

Headquarters Location:_____

Field Office Locations: _____

_____

_____

_____

Business Specialty or Focus:_____

Number of Full Time Staff:_____

Founding Date and Brief History:_____

_____

_____

_____

Texas Projects and/or Clients:_____
(past & current)

_____

_____

_____

Previous Housing Authority Experience: **YES** **NO**

List the Authorities: _____

_____

_____

Proposed Subcontractors

Note: A completed Profile of Firm Form must be submitted for each subcontractor.

Proposed Subcontractors					
Item	Company Name	Address	Phone	Specialty	S/W/M/V BE
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

I understand and agree that if awarded a contract as a result of this solicitation that the use of the above subcontractors is subject to the approval of SAHA and becomes a part of the contract. I further understand that any change in subcontractors also requires the pre-approval of SAHA.	_____ (Signature) _____ (Printed Name & Title) _____ (Company Name)

ATTACHMENT D
SWMBE Guidelines and Forms

M/WBE UTILIZATION STATEMENT
SAN ANTONIO HOUSING AUTHORITY
M/WBE PROGRAM OFFICE

Please read these instructions carefully before completing the required Minority/Women Business Enterprise (M/WBE) Utilization Statement. These instructions are designed to assist prime contractors/consultants document M/WBE program compliance or in preparing the required detailed and complete good faith effort information.

Contractors/Consultants are required to submit detailed documentation when the contract specified M/WBE participation ranges or goals are not met. The SAHA M/WBE Program Manager will review and consider a bidder's or proposer's good faith efforts in assisting SAHA to meet its M/WBE policy and program objectives.

A. Bidders/Proposers are required to make sincere efforts in attempting to achieve the applicable SAHA M/WBE participation ranges or goals. The approved M/WBE participation ranges or goals will be monitored throughout the duration of the project;

B. All bidders/proposers are to complete Section A, Project Identification and Section B, Project M/WBE Utilization, if applicable. Should there be subcontracting/sub consulting opportunities, yet the bidder/proposer *not* achieve the project's applicable M/WBE participation range or goal, the bidder/proposer must complete all other sections of the Statement.

C. This Statement should be prepared by the company's project M/WBE Coordinator or designee. The Statement must be signed and dated by an authorized company official. The Coordinator or designee should have a working knowledge as to the project's subcontracting or sub-consulting and supplier activities (actual and anticipated). This individual shall be a key figure in directing the prime contractor's M/WBE activities.

D. The M/WBE Utilization Statement demonstrating a contractor's good faith efforts is subject to the SAHA M/WBE Program Coordinator's review and approval.

E. SAHA requires all M/WBE firms to be certified as such by an entity acceptable to SAHA for project M/WBE credit.

F. SAHA reserves the right to approve all additions or deletions of subcontractors, subconsultants, and/or major vendors. In the event that an M/WBE subcontractor, subconsultant, and/or major vendor is replaced, the contractor must make a good faith effort to involve and utilize another M/WBE subcontractor, sub consultant, and/or major vendor.

Should you have any questions or need additional information, please contact:

Candace Morin
818 S Flores
San Antonio, TX 78204
Section 3/SWMBE Coordinator
candace_morin@saha.org
210-477-6165

FOR SAHA PROCUREMENT DEPARTMENT USE ONLY
Reviewed by: _____
Date: _____
Signature of SAHA Official: _____
Recommendation: Approval: _____ Denial: _____
subject to the SAHA M/WBE Program Manager's review and approval.

M/WBE UTILIZATION STATEMENT
SAN ANTONIO HOUSING AUTHORITY
M/WBE PROGRAM OFFICE

SECTION A: PROJECT IDENTIFICATION

Project Number_____ Project Title_____

Contract Amount _____ Company Name _____

Project Participation Range/Goal: M/WBE ____ %

Contract Anticipated Participation Range: M/WBE ____ %

The M/WBE participation range/goal is expressed as a percentage of the total dollar amount of the prime contract awarded to M/WBEs. The goal is applicable for those areas, which the prime contractor has subcontracted, sub-consulted, and/or major supplies necessary in the performance of the contract.

SECTION B: SUBCONTRACTOR/SUB CONSULTANT/VENDOR UTILIZATION

1. List all actual *and* anticipated subcontracts, subconsultants, and/or major material purchases, include *both* M/WBE and non-M/WBE, to be utilized on the project (*use additional sheets if necessary*).

TRADE AREA	ESTIMATED AMOUNT ($)	SUB/SUPPLIER	SUB/SUPPLIER M/WBE Yes (√) No	

2. MBE utilization in total dollars: _____ WBE utilization in total dollars: _____
3. Overall MBE utilization percentage (%): _____
4. Overall WBE utilization percentage (%): _____
5. Overall M/WBE utilization percentage (%): _____
6. Anticipated M/WBE utilization on this contract will occur:
Throughout ___ Beginning 1/3 ___ Middle 1/3 ___ Final 1/3 ___

Please Note: SAHA will credit only those M/WBEs that have been certified by an entity acceptable to SAHA. All changes, additions, or deletions occurring during the life of this contract relative to use of the listed subcontractors, sub-consultants and/or

major suppliers, M/WBE or otherwise, must be submitted to SAHA for review and approval.

If Bidder/Proposer is unable to meet the M/WBE participation range/goal, please proceed to complete Section C and submit documentation demonstrating contractual good faith efforts.

SECTION C: GOOD FAITH EFFORT

The following items are minimally considered as good faith efforts and demonstrate specific initiatives made in attempting to achieve SAHA's M/W/BE participation ranges. The bidder/proposer is not limited to these particular areas and may include other efforts deemed appropriate. Please feel free to elaborate on any question below.

Required Questions	Yes	No
1. If applicable, was your company represented at the pre-bid conference?		
2. Did your company request and obtain a copy of the certified M/WBE firms?		
3. Were M/WBE firms solicited for contract participation?		
4. Provide listing of solicited M/WBEs with whom contact was made? Please identify name of company, contact person, date, phone number and briefly describe nature of solicitation. **(Include as an Attachment)**		
5. Was direct contact made with SAHA's M/WBE Program Office? If yes, please identify date/person contacted and assistance sought. **(Include as an Attachment)**		
6. Identify all M/WBE support agencies/associations contacted for M/WBE assistance or solicitation (Minority Chamber's of Commerce, purchasing councils, contractor groups, etc.). **(Please attach copies of solicitation letters of assistance and/or describe, as an Attachment to this section, the personal contact made)**		
7. Were bid opportunities related to this project advertised in minority/women newspapers and trade journals? **(If yes, please include a copy of the advertisement or detail the name of the publication(s), date of advertisement and describe the solicitation)**		
8. Were copies of plans and specification furnished to any M/WBEs?		
9. Were subcontractors, subconsultants, and/or suppliers (if applicable) required to provide insurance or be bonded? **(If yes, please detail any assistance that was provided or if they were referred, to whom)**		
10. List, as an Attachment, all M/WBE bids received but rejected. Identify company name, contact person, telephone number, date, trade area, and the reason for rejecting the bid/proposal.		
11. Discuss any other effort(s) aimed at involving M/WBEs (Include as an Attachment): (a) Identify any specific efforts to divide work, in accordance with normal industry practices, to allow maximum M/WBE participation. (b) Discuss joint ventures initiatives, requesting second-tier M/WBE		

subcontracting, etc., if any. (c) List all other good faith efforts employed, please elaborate.		

The undersigned acknowledges and states that all information submitted as part of this Good Faith Effort Statement is true and correct to the best of his/her knowledge. I further agree that this document shall be attached thereto and become a binding part of the SAHA contract.

_____	_____
Print Name	***Title Date***
_____	_____
Signature	***Telephone Number***

ATTACHMENT E
Proposal Checklist and Certification

PROPOSAL Checklist and Certification

(Attachment E)

(This Form must be fully completed and placed under Tab No. 8 of the proposal submitted.)

Instructions: Unless otherwise specifically required, the items listed below must be completed and included in the proposal submittal. Please complete this form by marking an "X," where provided, to verify that the referenced completed form or information has been included within the "hard copy" proposal submittal submitted by the Respondents. Also, complete the Section 3 Statement and the Respondent's Statement as noted below:

X=ITEM INCLUDED	SUBMITTAL ITEMS Change these for the section headings
_____	Tab 1 References
_____	Tab 2 HUD and State Forms
_____	Tab 3 Profile of Firm, Company Biography, and Subcontractors List
_____	Tab 4 Evaluation Criteria Response
_____	Tab 5 Small/Minority/Disadvantaged/Veteran Business Enterprise Utilization Plan
_____	Tab 6 Proposal Checklist and Certification
_____	Tab 7 Subcontractors
_____	Tab 8
_____	Tab 9
_____	
_____	

Respondent's Certification

By signing below, Respondent certifies that the following statements are true and correct:

1. He/she has full authority to bind Respondents and that no member of Respondent's organization is disbarred, suspended or otherwise prohibited from contracting with any federal, state or local agency,

2. Items for which Proposals were provided herein will be delivered as specified in the Proposal,

3. In performing this contract, the contractor(s) shall comply with any and all applicable federal, state or local laws including but not limited to: Occupational Safety & Health, Equal Employment Opportunity, Immigration and Naturalization, The Americans with Disabilities Act, State Tax and Insurance Law, and the Fair Housing Act.,

4. Respondents agrees that this proposal shall remain open and valid for at least a period of 90 days from the date of the Proposal Opening and that this Proposal shall constitute an offer, which, if accepted by SAHA and subject to the terms and conditions of such acceptance, shall result in a contract between SAHA and the undersigned Respondents,

5. He/she has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with this Proposal,

6. Respondents, nor the firm, corporation, partnership, or institution represented by the Respondents, or anyone acting for such firm, corporation or institution has violated the antitrust laws of the State of Texas or the Federal Antitrust laws, nor communicated directly or indirectly the Proposal made to any competitor or any other person engaged in such line of business,

7. Respondents has not received compensation for participation in the preparation of the specifications for this RFP,

8. Non-Collusive Affidavit: The undersigned party submitting this Proposal hereby certifies that such Proposal is genuine and not collusive and that said Respondents has not colluded, conspired, connived or agreed, directly or indirectly, with any Respondents or person, to put in a sham Proposal or to refrain from bidding, and has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the Proposal price of affiant or of any other Respondents, to fix overhead, profit or cost element of said Proposal price, or that of any other Respondents or to secure any advantage against SAHA or any person interested in the proposed contract; and that all statements in said Proposal are true.

9. Child Support**:** Pursuant to Section 231.006 (d) of the Texas Family Code, regarding child support, the bidder certifies that the individual or business entity named in this bid is not ineligible to receive the specified payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate.

10. Lobbying Prohibition**:** The Contractor agrees to comply with Section 1352 of Title 31, United States Code which prohibits the use of Federal appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: 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; or the modification of any Federal contract, grant, loan, or cooperative agreement.

Signature	**Date**
Printed Name	**Company**
E-mail address if available	
Phone	**Fax**

ATTACHMENT F
Form of Proposal

Do Not **include this form in the "COPIES"**

San Antonio Housing Authority
818 S. Flores
San Antonio, Texas 78204

Attention: Charles Bode, Assist. Director of Procurement

RE: 1911-913-45-4982 Pecan Hill Tree Removal and Sanitary Sewer Retrofit

Gentlemen:

The undersigned Respondent, having read and examined the RFP and associated documents for the ***Pecan Hill Tree Removal and Sanitary Sewer Retrofit*** and after thoroughly considering the factors which will affect the execution of the project and the cost thereof, does hereby propose this Proposal. All prices stated herein are firm and shall not be subject to escalation provided this Proposal is accepted within one hundred eighty (180) days after the official opening of proposals.

The undersigned hereby declares that the following list states any and all variations from and exceptions to the requirements of the proposal requirements and that, otherwise, it is the intent of this Proposal that the Project will be performed in strict accordance with the subsequent Contract Documents.
(If no exceptions are taken, indicate so by entering "None").

_____

_____

_____

_____

(Continue on separate page, if necessary, and attach hereto).

The undersigned Respondent herein proposes to execute the Property Rehabilitation and Modernization Services for the pricing/fee structure attached as a separate page hereto:

Dated this _____ day of _____, 20_____.

Offeror _____

By _____

Title _____

ATTEST:

_____

Business Address of Offeror _____

State of Incorporation _____

Address of Principal Office_____

_____

Email:_____

Fee Sheet

The undersigned proposer hereby states that by completing and submitting this Form and all other documents within this submittal, he/she is verifying that all information provided herein is, to the best of his/her knowledge, true and accurate, and that if SAHA discovers that any information entered herein to be false, that shall entitle SAHA to not consider or make award or to cancel any award with the undersigned party. Further, by completing and submitting the submittal, and by entering the costs where provided, the undersigned is thereby agreeing to abide by all terms and conditions pertaining to this RFP as issued by SAHA, in hard copy. Pursuant to all RFP Documents, all attachments, and all completed Documents submitted by proposer, including these forms, addendums, and all attachments, the undersigned proposes to supply SAHA with the services described herein for the fee(s) entered within the areas provided.

Base Bid Items	Qty	Unit	Cost
#1. Tree Removal and Site Improvements complete and turnkey as specified herein	**1**	**Job**	**$**

Respondent must enclose a supporting Schedule of Values/Build of Materials.

Delivery in _____ days: (Failure to enter a delivery time will subject bidder to completion in 240 days. Days are defined as calendar days.)

Unit Price items: These items will be utilized for unforeseen/hidden damage and require approval of the project manager. Items are to be installed complete and finished (turnkey) to match existing material where applicable. SAHA will determine which if any will be utilized.

Item	Unit	Est. Qty	Unit Cost	Extension
Hauling Spoils	cuyd	120	$	$
Pavement Base	cuyd	60	$	$
Asphalt Pavement	sqft	100	$	$
Tunneling	cuyd	1000	$	$
Flowable Fill	cuyd	15	$	$
Concrete	cuyd	15	$	$
Hydrostatic Testing Potable Water	ea	15	$	$
Hydrostatic Testing Sanitary Sewer	ea	15	$	$
Leak Detection	hr	8	$	$
Sanitary Sewer Pipe 1-1/2 in	lft	50	$	$
Sanitary Sewer Pipe 2 in	lft	60	$	$
Sanitary Sewer Pipe 4 in	lft	50	$	$
Sanitary Sewer Pipe 6 in	lft	25	$	$
Sanitary Sewer Pipe 8 in	lft	20	$	$
Sewer Fitting Coupling 1-1/2 in	ea	15	$	$
Sewer Fitting Coupling 2 in	ea	15	$	$
Sewer Fitting Coupling 4 in	ea	25	$	$
Sewer Fitting Coupling 6 in	ea	14	$	$
Sewer Fitting Coupling 8 in	ea	8	$	$
Sewer Fitting 90 degree 1-1/2 in	ea	10	$	$
Sewer Fitting 90 degree 2 in	ea	10	$	$
Sewer Fitting 90 degree 4 in	ea	10	$	$
Sewer Fitting 90 degree 6 in	ea	10	$	$
Sewer Fitting 90 degree 8in	ea	10	$	$
Sewer Fitting Tee (T) 1-1/2 in	ea	5	$	$
Sewer Fitting Tee (T) 2 in	ea	5	$	$
Sewer Fitting Tee (T) 4 in	ea	5	$	$
Sewer Fitting Tee (T) 6 in	ea	5	$	$
Sewer Fitting Tee (T) 8 in	ea	5	$	$
Sewer Fitting Wye (Y) 1-1/2 in	ea	5	$	$
Company Name:				

Item	Unit	Est. Qty	Unit Cost	Extension
Sewer Fitting Wye (Y) 2 in	ea	5	$	$
Sewer Fitting Wye (Y) 4 in	ea	5	$	$
Sewer Fitting Wye (Y) 6 in	ea	5	$	$
Sewer Fitting Wye (Y) 8 in	ea	5	$	$
Plumbing repair 1/2" Galvanized pipe	ea	10	$	$
Plumbing repair 3/4" Galvanized pipe	ea	10	$	$
Plumbing repair 1" Galvanized pipe	ea	10	$	$
Plumbing repair 1-1/4" Galvanized pipe	ea	5	$	$
Plumbing repair 1-1/2" Galvanized pipe	ea	5	$	$
Plumbing repair 2" Galvanized pipe	ea	5	$	$
Plumbing repair 1/2" Galvanized retrofit & Install Brass Ball Valve	ea	10	$	$
Plumbing repair 3/4" Galvanized retrofit & Install Brass Ball Valve	ea	10	$	$
Plumbing repair 1" Galvanized retrofit & Install Brass Ball Valve	ea	10	$	$
Plumbing repair 1-1/4" Galvanized retrofit & Install Brass Ball Valve	ea	5	$	$
Plumbing repair 1-1/2" Galvanized retrofit & Install Brass Ball Valve	ea	5	$	$
Plumbing repair 2" Galvanized retrofit & Install Brass Ball Valve	ea	5	$	$
Plumbing repair 1/2" Galvanized fitting 90˚	ea	10	$	$
Plumbing repair 3/4" Galvanized fitting 90˚	ea	10	$	$
Plumbing repair 1" Galvanized fitting 90˚	ea	10	$	$
Plumbing repair 1-1/4" Galvanized fitting 90˚	ea	5	$	$
Plumbing repair 1-1/2" Galvanized fitting 90˚	ea	5	$	$
Plumbing repair 2" Galvanized, fitting 90˚	ea	5	$	$
Plumbing repair 1/2" Galvanized fitting (T) Tee	ea	10	$	$
Plumbing repair 3/4" Galvanized fitting (T) Tee	ea	10	$	$
Plumbing repair 1" Galvanized fitting (T) Tee	ea	10	$	$
Plumbing repair 1-1/4" Galvanized fitting (T) Tee	ea	5	$	$
Plumbing repair 1-1/2" Galvanized fitting (T) Tee	ea	5	$	$
Plumbing repair 2" Galvanized fitting (T) Tee	ea	5	$	$
Plumbing repair 1/2" Galvanized fitting (Y) WYE	ea	10	$	$
Plumbing repair 3/4" Galvanized fitting (Y) WYE	ea	10	$	$
Plumbing repair 1" Galvanized fitting (Y) WYE	ea	10		
Plumbing repair 1-1/4" Galvanized fitting (Y) WYE	ea	5	$	$
Plumbing repair 1-1/2" Galvanized fitting (Y) WYE	ea	5	$	$
Plumbing repair 2" Galvanized fitting (Y) WYE	ea	5	$	$
Plumbing repair 1/2" Galvanized fitting Coupling	ea	10	$	$
Plumbing repair 3/4" Galvanized fitting Coupling	ea	10	$	$
Plumbing repair 1" Galvanized fitting, Coupling	ea	10	$	$
Plumbing repair 1-1/4" Galvanized fitting Coupling	ea	5	$	$
Plumbing repair 1-1/2" Galvanized fitting Coupling	ea	5	$	$
Plumbing repair 2" Galvanized fitting, Coupling	ea	5	$	$
Plumbing repair 1/2" Copper (L Hard) pipe	ea	15	$	$
Plumbing repair 3/4" Copper (L Hard) pipe	ea	15	$	$
Plumbing repair 1" Copper (L Hard) pipe	ea	15	$	$
Plumbing repair 1-1/4" Copper (L Hard) pipe	ea	8	$	$
Plumbing repair 1-1/2" Copper (L Hard) pipe	ea	8	$	$
Plumbing repair 2" Copper (L Hard) pipe	ea	8	$	$
Company:				**Page 2 of 4**

Item	Unit	Est. Qty	Unit Cost	Extension
Plumbing repair 1/2" Copper fitting 90˚	ea	15	$	$
Plumbing repair 3/4" Copper fitting 90˚	ea	15	$	$
Plumbing repair 1" Copper fitting 90˚	ea	15	$	$
Plumbing repair 1-1/4" Copper fitting 90˚	ea	8	$	$
Plumbing repair 1-1/2" Copper fitting 90˚	ea	8	$	$
Plumbing repair 2" Copper fitting 90˚	ea	8	$	$
Plumbing repair 1/2" Copper fitting (T) Tee	ea	15	$	$
Plumbing repair 3/4" Copper fitting (T) Tee	ea	15	$	$
Plumbing repair 1" Copper fitting (T) Tee	ea	15	$	$
Plumbing repair 1-1/4" Copper fitting (T) Tee	ea	8	$	$
Plumbing repair 1-1/2" Copper fitting (T) Tee	ea	8	$	$
Plumbing repair 2" Copper fitting (T) Tee	ea	8	$	$
Plumbing repair 1/2" Copper fitting (Y) WYE	ea	15	$	$
Plumbing repair 3/4" Copper fitting (Y) WYE	ea	15	$	$
Plumbing repair 1" Copper fitting (Y) WYE	ea	15	$	$
Plumbing repair 1-1/4" Copper fitting (Y) WYE	ea	8	$	$
Plumbing repair 1-1/2" Copper fitting (Y) WYE	ea	8	$	$
Plumbing repair 2" Copper fitting (Y) WYE	ea	8	$	$
Plumbing repair 1/2" Copper fitting coupling	ea	15	$	$
Plumbing repair 3/4" Copper fitting coupling	ea	15	$	$
Plumbing repair 1" Copper fitting coupling	ea	15	$	$
Plumbing repair 1-1/4" Copper fitting coupling	ea	8	$	$
Plumbing repair 1-1/2" Copper fitting coupling	ea	8	$	$
Plumbing repair 2" Copper fitting coupling	ea	7	$	$
Concrete Splash Blocks	ea	20	$	$
R&R Concrete Curb, match existing	lft	75	$	$
R&S Asphalt repair	sqft	150	$	$
Hot Asphalt Crack Sealant, prep & install	lft	800	$	$
Curb Painting	lft	225	$	$
Asphalt stripping 4in width	lft	270	$	$
No Parking Fire lane sign& pole installed	ea	5	$	$
Landscaping Items	**Unit**	**Est. Qty**	**Unit Cost**	**Extension**
Shrub Removal	ea	10	$	$
Shrub Pruning	cuyd	20	$	$
Landscape steel edging	lft	175	$	$
Weed Barrier	sqyd	20	$	$
Mulch, cedar	cuyd	20	$	$
Zeon Zoysia sod	sqft	1000	$	$
Zeon Zoysia Sod, weed killer, top soil, fertilizers	sqft	100	$	$
Site Grading	cuyd	100	$	$
Tree Pruning	cuyd	20	$	$
Landscape Maintenance-Establishment	mo	2	$	$
Top Soil landscape mix	cuyd	600	$	$
Nolina Foothill (1.25 QT)	ea	3	$	$
Aztec Grass (1.25 QT)	ea	30	$	$
Dalea Black (1 gallon)	ea	4	$	$
Rosemary (1 gallon)	ea	4	$	$
Lavender (1 gallon)	ea	4	$	$
Esperanza (1 gallon)	ea	4	$	$
Gaillardia Red (1 Flat)	ea	4	$	$
Indian Paint Brush (1 Flat)	ea	4	$	$
Bougainvillea (1 Flat)	ea	4	$	$
Company:				**Page 3 of 4**

Landscaping Items, continued	Unit	Est. Qty	Unit Cost	Extension
Texas Red Bud (1.5"0)	ea	6	$	$
Mountain Laurel (1.5"0)	ea	6	$	$
Company:				**Page 4 of 4**
Total All Unit Price Items		$		

Addenda Acknowledgements

Addendum #1_____ Date_____

Addendum #2_____ Date_____

Addendum #3_____ Date_____

Addendum #4_____ Date_____

ATTACHMENT G
Wage Decision

NOTE: ***To comply with State of Texas requirements the work on this project will comply with the Davis Bacon Building Wage Decision herein.***

General Decision Number: TX20190231 11/15/2019
Superseded General Decision Number: TX20180280

State: Texas Construction Type: Building County: Bexar County in Texas

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/04/2019
1	01/18/2019
2	08/02/2019
3	10/04/2019
4	11/15/2019

ASBE0087-014 01/01/2018	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR (Duct, Pipe and Mechanical System Insulation).....	$ 22.72	10.02

BOIL0074-003 01/01/2017	Rates	Fringes
BOILERMAKER.....	$ 28.00	22.35

ELEC0060-003 06/01/2019	Rates	Fringes
ELECTRICIAN (Communication Technician Only).....	$ 22.55	9%+5.45

* ELEC0060-004 07/01/2019	Rates	Fringes
ELECTRICIAN (Excludes Low Voltage Wiring).....	$ 28.60	18%+5.45

ELEV0081-001 01/01/2019	Rates	Fringes
ELEVATOR MECHANIC	$ 40.57	33.705

FOOTNOTES:

A. 6% under 5 years based on regular hourly rate for all hours worked. 8% over 5 years based on regular hourly rate for all hours worked.

B. Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Friday after Thanksgiving Day; Christmas Day; and Veterans Day.

ENGI0450-002 04/01/2014	Rates	Fringes
POWER EQUIPMENT OPERATOR Cranes	$ 34.85	9.85

IRON0066-013 06/01/2019	Rates	Fringes
IRONWORKER, STRUCTURAL	$ 22.70	6.73

IRON0084-011 06/01/2019	Rates	Fringes
IRONWORKER, ORNAMENTAL	$ 24.42	7.12

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* PLUM0142-009 08/07/2019	Rates	Fringes
HVAC MECHANIC (HVAC Electrical Temperature Control Installation Only)	$ 30.25	13.36
HVAC MECHANIC (HVAC Unit Installation Only)	$ 30.25	13.36
PIPEFITTER (Including HVAC Pipe Installation)	$ 31.05	13.76
PLUMBER (Excludes HVAC Pipe Installation)	$ 31.05	13.76

SFTX0669-002 04/01/2019	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers)	$ 29.53	21.27

SHEE0067-004 06/01/2019	Rates	Fringes
Sheet metal worker Excludes HVAC Duct Installation	$ 26.81	16.80
HVAC Duct Installation Only	$ 26.81	16.80

SUTX2014-006 07/21/2014	Rates	Fringes
BRICKLAYER	$ 22.15	0.00
CARPENTER (Acoustical Ceiling Installation Only)	$ 17.83	0.00
CARPENTER (Form Work Only)	$ 13.63	0.00
CARPENTER, Excludes Acoustical Ceiling Installation, Drywall Hanging, Form Work, and Metal Stud Installation	$ 16.86	4.17
CAULKER	$ 15.00	0.00
CEMENT MASON/CONCRETE FINISHER	$ 22.27	5.30
DRYWALL FINISHER/TAPER	$ 13.81	0.00
DRYWALL HANGER AND METAL STUD INSTALLER	$ 15.18	0.00
ELECTRICIAN (Low Voltage Wiring Only)	$ 20.39	3.04
IRONWORKER, REINFORCING	$ 12.27	0.00
LABORER: Common or General	$ 10.75	0.00
LABORER: Mason Tender - Brick	$ 11.88	0.00
LABORER: Mason Tender - Cement/Concrete	$ 12.00	0.00
LABORER: Pipelayer	$ 11.00	0.00
LABORER: Roof Tearoff	$ 11.28	0.00
LABORER: Landscape and Irrigation	$ 8.00	0.00
OPERATOR: Backhoe/Excavator/Trackhoe	$ 15.98	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader	$ 14.00	0.00

OPERATOR: Bulldozer	$ 14.00	0.00
OPERATOR: Drill	$ 14.50	0.00
OPERATOR: Forklift	$ 12.50	0.00
OPERATOR: Grader/Blade	$ 23.00	5.07
OPERATOR: Loader	$ 12.79	0.00
OPERATOR: Mechanic	$ 18.75	5.12
OPERATOR: Paver (Asphalt, Aggregate, and Concrete)	$ 16.03	0.00
OPERATOR: Roller	$ 12.00	0.00
PAINTER (Brush, Roller and Spray), Excludes Drywall Finishing/Taping	$ 13.07	0.00
ROOFER	$ 12.00	0.00
TILE FINISHER	$ 11.32	0.00
TILE SETTER	$ 14.94	0.00
TRUCK DRIVER: Dump Truck	$ 12.39	1.18
TRUCK DRIVER: Flatbed Truck	$ 19.65	8.57
TRUCK DRIVER: Semi-Trailer Truck	$ 12.50	0.00
TRUCK DRIVER: Water Truck	$ 12.00	4.11

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

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

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

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

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is

an abbreviation identifier of the union, which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

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

Survey Rate Identifiers

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

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

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

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

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

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END OF GENERAL DECISION