



City of Houston - Department of Aviation – Infrastructure Division

PROJECT MANUAL

**HOU TNC LOT PAVING
WILLIAM P. HOBBY AIRPORT (HOU)**

PROJECT No.: 238

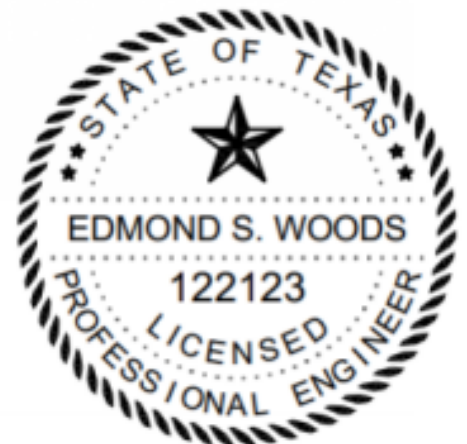
TIP-20-121-HOU

VOLUME NO. 2 OF 3 TOTAL VOLUMES

Divisions 01

June 2020

Atkins North America
200 Westlake Park Blvd., Suite 1100
Houston, TX 77079
(713) 576-8500



Edmond Woods, PE

06/12/2020

SECTION 01110
SUMMARY OF WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project description.
- B. Work description.
- C. City occupancy.
- D. Contractor-salvaged products.
- E. Separate contracts and work by City.
- F. Extra copies of Contract Documents.
- G. Permits, fees and notices.

1.02 THE PROJECT

The Project is the William P. Hobby Airport in Houston, Texas.

1.03 GENERAL DESCRIPTION OF THE WORK

- A. Construct the Work under a single general construction contract as follows:
- B. Construct the Work in a single stage
- C. The Work is summarized as the improvement of the existing gravel/asphalt TNC parking lot at Houston Hobby Airport by adding an new pavement surface.
 - 1. Cut and patch existing construction designated or required to remain and to receive new construction, following Section 01731- Cutting and Patching, and Section 01761 – Protection of Existing Services.
- D. Contract limit lines are shown diagrammatically on Drawings.
- E. The construction budget for this construction project is **TBD**.

1.04 CITY OCCUPANCY

SUMMARY OF WORK

The City will occupy the site and remain in operation after the entire period of construction for the conduct of normal operations.

- A. Cooperate with the City to reduce conflict, and to facilitate the City's operations. Coordinate Contractor's activities with City Operations or Maintenance personnel through City Engineer.
- B. Schedule Work to fit these requirements.

1.05 EXTRA COPIES OF CONTRACT DOCUMENTS

Use reproducible documents, furnished by City following Document 00700 Paragraph 2.2.2, to make extra copies of Contract Documents (dialo prints of Drawings and electrostatic copies of Project Manual) as required by Contractor for construction operations, and for Contractor's records following Sections 01726 - Base Facility Survey and 01770 - Contract Closeout. Follow Document 00700 Paragraph 1.3.

1.06 PERMITS, FEES AND NOTICES

Refer to Document 00700 Paragraph 3.14. Reimburse City for City's payment of fines levied against City or its employees because of Contractor's failure to obtain proper permits, pay proper fees, and make proper notifications. Reimbursement will be by Change Order, reducing the Contract Price as based upon the dollar amount of fines imposed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01145
CONTRACTOR'S USE OF PREMISES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Rights-of-way and access to the Work.
- B. Property and Base Facility outside contract limits.
- C. General requirements for exterior work.
- D. Work in AOA, including electrical lockout/tagout program.
- E. Interior work.
- F. Control of access into security areas.

1.02 SUBMITTALS

- A. Show start dates and duration of closures and impediments on construction schedule following Section 01325 - Construction Schedules.
- B. Prepare written requests, using Document 00931 - Request for Information, and submit requests at least 7 days before access is required, for following:
 - 1. Roadway, street, driveway, curbside and building main entrance/exit closures or impediments. Do not close or impede emergency exits intended to remain.
 - 2. Access to property outside contract limits, required to extend or connect work to utilities or environmental system controls in non-contract areas.
- C. For work involving electrical energy or other hazardous energy sources, submit a Lockout/Tagout Program.

1.03 RIGHTS-OF-WAY AND ACCESS TO THE WORK

- A. Confine access and operations and storage areas to contract limits and other areas provided by City, following Document 00700. Do not trespass on non-City-owned property or on airport occupants' spaces.
- B. Airport operates "around the clock." In cases of conflicts with construction operations, airport operations take precedence. Airport roads, streets, drives, curbsides and sidewalks,

CONTRACTOR'S USE OF PREMISES

and ticketing, baggage claim, security check points, concessions, restrooms, aircraft gates and similar passenger-related areas are intended for year-round uninterrupted use and access by the public and airport operations. Maintain uninterrupted traffic movement.

1. Aircraft and emergency vehicles have right-of-way in AOA.
 2. Private vehicles, public transportation and emergency vehicles have right-of-way on roads, streets, driveways and curbsides.
 3. Passengers have right-of-way in public spaces. Occupants have right-of-way in other occupied areas.
- C. Follow instructions of the City Engineer, Airport Manager and of ATCT. Follow FAA procedures.
- D. FAA will review Contractor's submittals for compliance with FAA requirements. Attend meetings with FAA to assist the City Engineer in obtaining approvals.
- E. Continued violations of or flagrant disregard for policies may be considered default, and individuals disregarding requirements may be determined as objectionable by the City Engineer, following provisions of Document 00700.

Do not close or impede rights-of-way without City Engineer approval.

- F. City Engineer may approve temporary storage of products, in addition to areas shown on Drawings, in occupied areas and other on-airport areas if storage piles do not interfere with airport operations.
1. No permission will be granted for this type of storage in Terminal roadway areas.
 - 2.
 3. Restrict permitted storage along roadways to 1,000 lineal feet, 6 feet high and no closer than 10 feet to pavement.

1.04 PROPERTY AND BASE FACILITY OUTSIDE CONTRACT LIMITS

- A. Do not alter condition of property or Base Facility outside contract limits.
- B. Means, methods, techniques, sequences, or procedures which may result in damage to property outside of contract limits are not permitted.
- C. Repair or replace damage to property outside contract limits to condition existing at start of the Work, or better.

1.05 GENERAL REQUIREMENTS FOR EXTERIOR WORK

- A. Obtain permits and City Engineer's approval prior to impeding or closing roadways, streets, driveways, Terminal curbsides and parking areas.

CONTRACTOR'S USE OF PREMISES

- B. Maintain emergency vehicle access to the Work and to fire hydrants, following Section 01505 - Temporary Facilities.
- C. Do not obstruct drainage ditches or inlets. When obstruction is unavoidable due to requirements of the Work, provide grading and temporary drainage structures to maintain unimpeded flow.
- D. Locate by Section 01726 - Base Facility Survey and protect by Section 01505 - Temporary Facilities communications or data systems and/or direct-buried lines which may exist. Repair or replace damaged systems to condition existing at start of Work, or better.
- E. Public, Temporary, and Construction Roads and Ramps:
 - 1. Construct and maintain temporary detours, ramps, and roads to provide for normal public traffic flow when use of public roads or streets is closed by necessities of the Work.
 - 2. Provide mats or other means to prevent overloading or damage to existing roadways from tracked equipment or exceptionally large or heavy trucks or equipment.
 - 3. Construct and maintain access roads and parking areas following Section 01505 - Temporary Facilities.
- F. Excavation in Streets and Driveways:
 - 1. Do not hinder or needlessly impede public travel on roadways, streets or driveways for more than two blocks at any one time, except as approved by City Engineer.
 - 2. Obtain the City Traffic Management and Maintenance Department and City Engineer's approval when the Work requires closing of off-airport roadways, streets or driveways. Do not unnecessarily impede abutting property.
 - 3. Remove surplus materials and debris and open each block for public use as work in that block is complete. Acceptance of any portion of the Work will not be based on return of street to public use.
 - 4. Provide temporary crossings, or complete work in one continuous operation. Minimize duration of obstructions and impediments at drives or entrances.
- G. Provide barricades and signs following Sections 01505 - Temporary Facilities and 01507 - Temporary Signs.
- H. Traffic Control: Follow Section 01555 - Traffic Control and Regulation.
- I. Surface Restoration:

1. Restore site to condition existing before construction, following Section 01731 - Cutting and Patching, to satisfaction of City Engineer.
2. Follow Section **02571** for restoring paved areas.
3. Repair damaged turf areas, leveling with bank run sand following Section **02251**, or topsoil following Section **02920**, and re-sod following Section **02935**. Water and level newly sodded areas with adjoining turf using steel wheel rollers appropriate for sodding. Do not spot sod or sprig.

1.08 CONTROL OF SECURITY AREA ACCESS

- A. Install barricades and enclosures to prevent uncontrolled access into security areas, following Section 01505 - Temporary Facilities. Provide locked access points. Provide duplicate keys to City Engineer.
- B. Post one gatekeeper, employed by the Contractor, at each point of access through barricades or enclosures into security areas, during times when access points are not locked. Ensure persons entering are properly badged.
- C. Provide signs following Section 01507 - Temporary Signs.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01210
CASH ALLOWANCES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. City's allowances allocated to the items of work listed or as directed.
- B. See Document 00700 - General Conditions, Paragraph 3.11 for costs included and excluded from cash allowance values listed in 1.02 below.
- C. Follow Section 01255 - Modification Procedures for processing allowance expenditures. Cash Allowance sums remaining at Final Completion belong to the City, creditable by Change Order.

1.02 SCHEDULE OF CASH ALLOWANCES (TOTAL \$0 VALUE)

- A. Allowance Item 1 - Building Permit: For obtaining the Building Permit from City of Houston, \$ N/A.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CASH ALLOWANCES

01210-1 ver. 03.01.19

SECTION 01255
MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Signatories on behalf of City and Contractor.
- B. Contractor's documentation.
- C. Change Orders.
- D. Requests for Proposal.
- E. Work Change Directives.
- F. Execution of Modifications.
- G. Resolving Discrepancies.
- H. Requests for Information or Clarification.
- I. Correlation of Submittals.

1.02 SIGNATORIES

- A. Submit at the Preconstruction Conference (Section 01312 - Coordination and Meetings) a letter indicating the name and address of Contractor's personnel authorized to execute Modifications, and with responsibility for informing others in Contractor's employ or Subcontractors of same.

1.03 REFERENCES

- A. Blue Book: "Dataquest" Rental Rate Blue Book for Construction Equipment.
- B. Rental Rate: The full unadjusted base rental rate for the applicable item of equipment.

MODIFICATION PROCEDURES

1.04 CONTRACTOR'S DOCUMENTATION

- A. Maintain detailed records of changes in the Work. Provide full information required for identification and evaluation of proposed changes, and to substantiate costs of changes in the Work.
- B. Furnish sufficient data to allow City Engineer's evaluation of Contractor's responses to proposed changes.
- C. Include with each proposal the following minimum information (as applicable to form of Contract Price):
 - 1. Quantities of original Bid Schedule unit price work items (with additions, reductions, deletions, and substitutions).
 - 2. When work items are not included in Document 00410 - Bid Tabulation Form, provide unit prices for the new items, with proper supporting information.
 - 3. For Stipulated Price changes, furnish breakdown of labor, products, taxes, insurance, bonds, temporary facilities and controls as applicable, and overhead and profit.
 - 4. Justification for change, if any, in Contract Time.
 - 5. Additional data upon request.
- D. Payment for rented equipment will be made to the Contractor by actual invoice cost for the duration of time required to complete additional work. If additional work comprises only a portion of the rental invoice where the equipment would otherwise be on the site, compute the hourly equipment rate by dividing the actual monthly invoice by 176. (One day equals 8 hours and one week equals 40 hours.) Operating costs shall not exceed the estimated operating costs given for the item of equipment in the Blue Book.
- E. For changes in the Work performed on a time-and-materials basis using Contractor-owned equipment, compute rates with the Blue Book as follows:
 - 1. Multiply the appropriate Rental Rate (the lowest cost combination of hourly, daily, weekly or monthly rates) by an adjustment factor of 70 percent plus the full rate shown for operating costs. Use 150 percent of the Rental Rate for double shifts (one extra shift per day) and 200 percent of the Rental Rate for more than two shifts per day. No other rate adjustments apply.
 - 2. Standby Rates: 50 percent of the appropriate Rental Rate shown in the Blue Book. Operating costs are allowed.

1.05 CHANGE ORDERS

MODIFICATION PROCEDURES

- A. Changes to Contract Price or Time are made only by execution of a Change Order.
- B. Stipulated Price Change Order: Stipulated Price Change Orders are based on an accepted Proposal/Contract Modification including the Contractor's lump sum price quotation.
- C. Unit Price Change Order:
 - 1. Where Unit Prices for the affected items of Work are included in Document 00410 - Bid Tabulation Form, Unit Price Change Orders are based on unit prices as originally bid, subject to requirements in Articles 7 and 9 of Document 00700 - General Conditions.
 - 2. Where unit prices of Work are not pre-determined in Document 00410 - Bid Tabulation Form, Request for Proposal or Work Change Directive will state the unit prices to use.
- D. Time-And-Material Change Order:
 - 1. Provide an itemized account and supporting data after completion of change, within time limits indicated for claims in Document 00700 - General Conditions.
 - 2. City Engineer will determine the change allowable in Contract Price and Contract Time following Document 00700 - General Conditions.
 - 3. For changes in the Work performed on a time-and-material basis, furnish the following in addition to information specified in Paragraph 1.04.C:
 - a. Quantities and description of products and tools.
 - b. Taxes, insurance and bonds.
 - c. Overhead and profit, following Document 00700 - General Conditions Paragraphs 7.3.2.2.6 or Document 00800 - Supplementary Conditions.
 - d. Dates and times of work performance, and by whom.
 - e. Time records and certified copies of applicable payrolls.
 - f. Invoices and receipts for products, rented tools, and Subcontracts, similarly documented.

1.06 REQUEST FOR PROPOSAL

- A. City Engineer may issue a Request for Proposal, including a detailed description of proposed changes, supported by revised Drawings and Specifications, if applicable. Prepare and submit Contractor's response to the Request for Proposal within 7 days or as specified in the request.
- B. This document does not authorize work to proceed.

MODIFICATION PROCEDURES

- C. Follow instructions on back of the Request for Proposal.

1.07 WORK CHANGE DIRECTIVE (WCD)

- A. City Engineer may issue a WCD instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
- B. City Engineer may issue minor changes in the Work, not involving an adjustment to Contract Price or Time by using a WCD.
- C. The document will describe changes in the Work and will designate a method of determining change, if any, in Contract Price or Time. When properly executed, this document authorizes work to proceed. Follow instructions on back of the WCD.
- D. Promptly execute changes in the Work following the directions from the Work Change Directive.

1.08 RESOLVING DISCREPANCIES

- A. Complete Base Facility survey following Section 01726 - Base Facility Survey prior to preparation of submittal data and commencing main construction operations. Submit survey data of inaccessible concealed conditions as cutting and patching or demolition operations proceed.
- B. Prepare and submit a Request for Information for each separate condition with a written statement of substantive discrepancies, including specific scope, location and discrepancy discovered.
- C. Based upon the Contractor's knowledge of Base Facility conditions "as-found" and the requirements for the Work, propose graphic or written alternatives to Drawings and Specifications to correct discrepancies. Include as supplementary data to the Request for Information.
- D. Modifications due to concealed conditions are allowed only for conditions which are accessible only through cutting or demolition operations.
 - 1. No changes in the Contract Sum or Time are permitted for sight-exposed conditions or conditions visible by entry into access doors or panels and above lay-in or concealed spline acoustical ceilings, or by conditions described in Documents 00320 - Geotechnical Information or 00330 - Existing Conditions.

1.09 REQUEST FOR INFORMATION OR CLARIFICATION

- A. The Request for Information or Clarification does not authorize work that changes the Contract Price or Time.

MODIFICATION PROCEDURES

- B. Request clarification of Contract Documents or other information by using the Request for Information or Clarification.
 - 1. If additional work is required, then the requirement will be requested by the City Engineer's issuance of a Request for Information or Clarification; Request for Proposal; Work Change Directive.
 - 2. This document does not authorize work to proceed.
- C. Changes may be proposed by the Contractor only by submitting a Request for Information following Paragraph 1.08.
- D. The City Engineer may issue minor changes in the Work, not involving an adjustment to Contract Price or Time using a Request for Information or Clarification and following Document 00700 - General Conditions.
- E. Follow directions on back of the Request for Information or Clarification.

1.10 CORRELATION OF SUBMITTALS

- A. For Stipulated Price Contracts, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Price, following Section 01290 - Payment Procedures.
- B. For Unit Price Contracts, revise the next monthly estimate of work after acceptance of a Change Order to include new items not previously included and the appropriate unit rates.
- C. Promptly revise progress schedules to reflect any change in Contract Time, revise schedules to adjust time for other items of work affected by the change and resubmit for review following Section 01325 - Construction Schedules.
- D. Promptly record changes on record documents following Section 01770 - Contract Closeout.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

MODIFICATION PROCEDURES

01255-5 ver. 10.07.18

SECTION 01270
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedures for measurement and payment plus conditions for nonconformance assessment and nonpayment for rejected Products.

1.02 AUTHORITY

- A. Measurement methods delineated in Specification Sections are intended to complement criteria of this Section. In event of conflict, requirements of the Specification Section shall govern.
- B. Project Manager will take all measurements and compute quantities accordingly.
- C. Assist by providing necessary equipment, workers, and survey personnel
- D. Measurement and Payment paragraphs are included only in those Specification Sections of Division 01, where direct payment will be made. Include costs in the total bid price for those Specification Sections in Division 01 that do not contain Measurement and Payment paragraphs.

1.03 UNIT QUANTITIES SPECIFIED

- A. Quantity and measurement estimates stated in the Agreement are for contract purposes only. Quantities and measurements supplied or placed in the Work and verified by Project Manager will determine payment as stated in Article 9 of Document 00700 – General Conditions.
- B. When actual work requires greater or lesser quantities than those quantities indicated in Document 00410 – Bid Form, provide required quantities at Unit Prices contracted, except as otherwise stated in Article 9 of Document 00700 – General Conditions.

1.04 MEASUREMENT OF QUANTITIES

- A. Measurement by Weight: Reinforcing Steel, rolled or formed steel or other metal shapes are measured by CRSI or AISC Manual of Steel Construction weights. Welded assemblies are measured by CRSI or AISC Manual of Steel Construction or scale weights.
- B. Measurement by Volume:

MEASUREMENT AND PAYMENT

1. Stockpiles: Measured by cubic dimension using mean length, width, and height or thickness.
2. Excavation and Embankment Materials: Measured by cubic dimension using average end area method.
- C. Measurement by Area: Measured by square dimension using mean length and width or radius.
- D. Linear Measurement: Measured by linear dimension, at item centerline or mean chord.
- E. Stipulated Price Measurement: By unit designation in the Agreement.
- F. Other: Items measured by weight, volume, area, or linear means or combination, as appropriate, as completed item or unit of the Work.
- G. Measurement by Each: Measured by each instance or item provided.
- H. Measurement by Lump Sum: Measure includes all associated work.

1.05 PAYMENT

- A. Payment includes full compensation for all required supervision, labor, Products, tools, equipment, plant, transportation, services, and incidentals; and erection, application or installation of an item of the Work; and Contractor's overhead and profit.
- B. Total compensation for required Unit Price work shall be included in Unit Price bid in Document 00410 – Bid Form. Claims for payment as Unit Price work, but not specifically covered in the list of Unit Prices contained in Document 00410 – Bid Form, will not be accepted.
- C. Interim payments for stored materials will be made only for materials to be incorporated under items covered in Unit Prices, unless disallowed in Document 00800 - Supplementary Conditions.
- D. Progress payments will be based on Project Manager's observations and evaluations of quantities incorporated in the Work multiplied by Unit Price.
- E. Final payment for work governed by Unit Prices will be made on the basis of actual measurements and quantities determined by Project Manager multiplied by the Unit Price for work which is incorporated in or made necessary by the Work.

1.06 NONCONFORMANCE ASSESSMENT

- A. Remove and replace work, or portions of the Work, not conforming to the Contract documents.

- B. When not practical to remove and replace work, City Engineer will direct one of the following remedies:
 - 1. Nonconforming work will remain as is, but Unit Price will be adjusted lower at discretion of City Engineer.
 - 2. Nonconforming work will be modified as authorized by City Engineer, and the Unit Price will be adjusted lower at the discretion of City Engineer, when modified work is deemed less suitable than specified
- C. Specification sections may modify the above remedies or may identify a specific formula or percentage price reduction.
- D. Authority of City Engineer to assess nonconforming work and identify payment adjustment is final.

1.07 NONPAYMENT FOR REJECTED PRODUCT

- A. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in an unacceptable manner.
 - 2. Products determined as nonconforming before or after placement.
 - 3. Products not completely unloaded from transporting vehicles.
 - 4. Products placed beyond lines and levels of required work.
 - 5. Products remaining on hand after completion of the Work, unless specified otherwise.
 - 6. Loading, hauling, and disposing of rejected Products.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

MEASUREMENT AND PAYMENT

01270-3 ver. 08.01.2003

SECTION 01290
PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Schedule of Values.
- B. Billing forecast.
- C. Value/ time log.
- D. Expenditure of Cash Allowances.
- E. Applications for Payment.
- F. Payment for mobilization work.
- G. Final payment.

1.02 DEFINITIONS

- A. *Schedule of Values*: Itemized list, prepared by the Contractor, establishing the value of each part of the Work for a Stipulated Price contract, or for Major Stipulated Price items for a Unit Price contract. The Schedule of Values is the basis for preparing applications for payment. Quantities and unit prices may be included in the schedule when approved or required by City Engineer.
- B. *Major Stipulated Price Item*: Item listed in Document 00410 - Bid Tabulation Form which qualifies as Major Unit Price Work following Document 00700 - General Conditions Paragraph 9.1.5.

1.03 SUBMITTALS

- A. The Contractor must utilize, a web-based system run by the Houston Airport System, to submit Invoices. Before doing so, the Contractor must attend a brief mandatory training session, which will be conducted by a member of HAS. The Contractor must contact the designated HAS trainer prior to the start of construction to schedule a time for training. Access to will not be given to the Contractor's team until training is completed. All document collaboration will be done using a web-based system.

PAYMENT PROCEDURES

- B. Submit electronic version in native format of preliminary Schedule of Values at the Preconstruction Conference (Section 01312 - Coordination and Meetings). Submit electronic copy in native format of final and updated Schedule of Values with each copy of Application for Payment.
- C. Submit electronic version in native format of Billing Forecast and Value/Time Log at first Progress Meeting (Section 01312 - Coordination and Meetings). Obtain approval before making first application for payment. Coordinate this submittal with Master Schedule specified in Section 01325 - Construction Schedules.
- D. Produce electronic document for Billing Forecast and Value/Time Log on 8 1/2 by 11-inch white bond paper.

1.04 SCHEDULE OF VALUES

- A. Prepare Schedule of Values as follows:
 - 1. Prior to the submission of the initial Application for Payment, Contractor shall obtain Project Manager approval for the format and content of the schedule of values for all invoices including the grouping of costs along the lines of specific equipment, asset or deliverable produced as a result of the work performed.
 - 2. For Stipulated Price contracts, use the Table of Contents of the Project Manual as the outline for listing the value of work by Sections.
 - 3. For Unit Price contracts, use Document 00410 as the outline. Include a proportional share of Contractor's overhead and profit in each Unit Price item so the sum of all items equals the Contract Price.
 - 4. List mobilization, bonds, insurance, accepted Alternates and Cash Allowances as separate items.
- B. Round off values for each item to the nearest \$100.00, except for the value of one item of the Contractor's choice, if necessary, to make the total of all items in the Schedule of Values equal the Contract Price.
- C. At direction of City Engineer revise the Schedule of Values and resubmit for items affected by Modifications, at least 10 days prior to submitting the next Application for Payment. List each Change Order as a separate item.

1.05 BILLING FORECAST

Prepare an electronic graphic or tabular Billing Forecast of estimated monthly applications for payment for the Work.

- A. This information is not required in the monthly updates, unless significant changes in work require resubmittal of the schedule. Allocate the units indicated in the bid schedule or the schedule of values to Construction Schedule activities (weighted allocations are acceptable, where appropriate). Spread the dollar value associated with each allocated unit across the duration of the activity on a monthly basis. Indicate the total for each month and cumulative total.
- B. Billing forecast is only for planning purposes of City Engineer. Monthly payments for actual work completed will be made by City Engineer following Document 00700 - General Conditions.

1.06 VALUE/ TIME LOG

Prepare an electronic Value/ Time Log as a slope chart, showing:

- A. Original Contract Time/ Modified Contract Time: x coordinate, in weeks.
- B. Original Contract Value/ Modified Contract Value: y coordinate, in thousands of dollars.

1.07 EXPENDITURE OF CASH ALLOWANCES

- A. Verify with City Engineer that work and payment requested is covered by Cash Allowance.
- B. Prepare electronic version of Document 00685 - Request for Information following Section 01726 - Base Facility Survey, include following minimum data to support Contractor's request for expenditure of Cash Allowances listed in Section 01210 - Cash Allowances, and process in a timely manner to allow detailed review by City Engineer:
 - 1. Statement of fact indicating reason(s) expenditure is required. Include photographs or video following Section 01321 - Construction Photographs documenting existing conditions.
 - 2. Quantity survey, made from on-site measurements, of quantity and type of work required to properly complete work.
 - 3. Cost of work, including detailed proposals from trade(s) responsible. For work governed by unit prices, applying unit prices following this Section.
 - 4. Trade(s) responsible for corrective work.
 - 5. Change in Contract Time.
 - 6. Administrative data, including contract name and number, and Contractor's name.
- C. Do not commence affected work without written authorization.

PAYMENT PROCEDURES

- D. Process approved expenditures following Section 01255 - Modification Procedures and Application for Payment process below.

1.08 APPLICATIONS FOR PAYMENT

- A. Submit each Application for Payment following Document 00700 and as directed via SharePoint which utilizes an electronic version of the American Institute of Architects Document G702 including G703 continuation sheets.

1.09 PAYMENT FOR MOBILIZATION WORK

- A. Measurement for mobilization is on a lump sum basis if included as a unit price in Document 00410.

- B. Mobilization payments paid upon application by Contractor subject to:

- 1. Authorization for payment of 50 percent of the contract price for mobilization will be made upon receipt and approval by City Engineer of the following submittal items, as applicable:

- a. Schedule of values.
- b. Trench safety program.
- c. Construction schedule.
- d. Photographs.
- e. Submit QC Program

- C. Authorization for payment of the remaining 50 percent of the Contract Price for mobilization will be made upon completion of Work amounting to 5 percent of the Contract Price less the mobilization unit price.

- D. Mobilization payments are subject to retainage amounts stipulated in the Document 00700.

1.10 FINAL PAYMENT

- A. When Contractor considers the Work is complete, submit written certification that:

- 1. Work is fully inspected by the Contractor for compliance with Contract Documents.
- 2. Work follows the Contract Documents, and deficiencies noted on the Punch List are corrected.

PAYMENT PROCEDURES

3. Products are tested, demonstrated and operational.
4. Work is complete and ready for final inspection.

B. In addition to submittals required by Document 00700 and other Sections:

1. Furnish submittals required by governing authorities, such as Certificate of Occupancy and Certificates of Inspection.
2. Submit a final statement of accounting giving total adjusted Contract Price, previous payments, and sum remaining due (final Application for Payment).

C. When the Work is accepted, and final submittals are complete, a final Certificate for Payment will be issued.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01292
SCHEDULE OF VALUES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation and submittal of Schedule of Values for Stipulated Price Contracts or for Major Unit Price Work on Unit Price Contracts.

2.01 PREPARATION

- A. For Stipulated Price Contracts, subdivide the Schedule of Values into logical portions of the Work, such as major work items or work in contiguous construction areas. Use Section 01325 • Construction Schedule as a guide to subdivision of work items. Directly correlate Items in the Schedule of Values with tasks in the Construction Schedule. Organize each portion using the Project Manual Table of Contents as an outline for listing value of the Work by Sections. A pro rata share of mobilization, Bonds, and insurance may be listed as separate items for each portion of the Work.
- B. For Unit Price Contracts, items should include a proportional share of Contractor's overhead and profit so that total of all items will equal Contract Price.
- C. For lump sum equipment items, where submittal of operation and maintenance data and testing are required, include separate items for equipment operation and maintenance data where:
 - 1. submittal of maintenance data is valued at five percent of the lump sum amount for each equipment item and
 - 2. submittal for testing and adjusting is valued at five percent of the lump sum amount for each equipment item.

Round off figures for each item listed to the nearest \$100. Set the value of one item, when necessary, to make total of all values equal the Contract Price for Stipulated Price Contracts or the lump sum amount for Unit Price Work.

3.01 SUBMITTAL

- A. Submit the Schedule of Values, in accordance with requirements of Section 01330 - Submittal Procedures, at least 10 days prior to processing of the first Certificate for Payment.

SCHEDULE OF VALUES

- B Submit the Schedule of Values in an approved electronic spreadsheet file and an 8 1/2•inch by 11•inch print on white bond paper.
- C. Revise Schedule of Values for items affected by Contract Modifications. After City Engineer has reviewed changes, resubmit at least 10 days prior to the next scheduled Certificate for Payment date.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01312
COORDINATION AND MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General coordination is required throughout the documents and the Work. Refer to all of the Contract Documents and coordinate as required to maintain communications between Contractor, City and Designer; Subcontractors and Suppliers. Assist City with communications between Contractor and City's separate contractors.
- B. Preconstruction conference.
- C. Progress meetings.
- C. Daily briefings.

1.02 SUBMITTALS

In addition to submittals related to meetings and described elsewhere in this Section, see following Sections for submittals prepared under those Sections, but submitted under this Section:

- A. Section 01255 - Modification Procedures: Individual authorized to execute Modifications.
- B. Section 01506 - Temporary Controls: "Airport Construction Control Plans", containing submittals prepared under Section 01506 and other Sections referenced therein.

1.03 RESPONSIBILITIES FOR MEETINGS

- A. City Engineer may act directly or through designated representatives identified by name at the Preconstruction Conference, and will schedule, chair, prepare agenda, record and distribute minutes and provide facilities for conferences and meetings.
- B. Contractor:
 - 1. Present status information and submittal data for applicable items.
 - 2. Record and distribute Contractor's corrections to meeting minutes.
 - 3. Provide submittal data for attendees. Prepare, reproduce and issue Contractor's documents to support conferences and meetings. Issue typically as part of each session

COORDINATION AND MEETINGS

unless more frequent publication is necessary. Issue one copy to each conference attendee, and to others as directed by City Engineer and as required by Contractor.

- a. Transmit documents requiring urgent action by email or messenger.
- b. Provide electronic and/or hard copies as required to properly document the project or project actions. The Contractor shall coordinate the submittal format with the City Engineer.
- c. Initiate and provide facilities for Coordination Meetings as required in 1.04. H.1.
- d. Costs for documentation are the Contractor's responsibility.

1.04 CONTRACTOR COORDINATION

- A. Coordinate scheduling, submittals, and work of Sections to achieve efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify characteristics of products are compatible with existing or planned construction. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing products in service.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. Conceal pipes, ducts, wiring and fasteners in finished areas, except as otherwise indicated. Coordinate locations of fixtures and outlets with finish elements. Locate work requiring accessibility to coordinate with existing access panels and doors.
- E. Coordinate completion and clean up of work for Substantial Completion and for portions of the Work designated for partial occupancy.
- F. Coordinate access to site and within the work area(s) for correction of nonconforming work. Minimize disruption of occupants' activities where work areas are occupied.
- G. Do not proceed with affected work until discrepancies in contract requirements are resolved and unsatisfactory substrate and site conditions are corrected.
- H. Coordination Drawings: Before materials are fabricated or Work begun, prepare coordination Drawings including plans, elevations, sections, and other details as required to clearly define relationships between sleeves, piping, ductwork, conduit, ceiling grid, lighting, fire sprinkler, HVAC equipment and other mechanical, plumbing and electrical equipment with other components of the building such as beams, columns, ceilings, and walls.
 1. Hold Coordination Meetings with trades providing the above Work, to coordinate Work of the trades for each floor and mechanical areas.

COORDINATION AND MEETINGS

2. Prepare coordination Drawings to 1/4" = 1'-0" scale for general layout and 3/8" = 1' -0" for plans and sections in congested areas such as equipment spaces.
3. Resolve conflicts between trades, prepare composite coordination Drawings and obtain signatures on original composite coordination Drawings.
4. When conflicts cannot be resolved, Contractor shall request clarification prior to proceeding with that portion of the Work affected by such conflicts or discrepancies. Prepare interference Drawings to scale and include plans, elevations, sections, and other details as required to clearly define the conflict between the various systems and other components of the building such as beams, columns, and walls, and to indicate the Contractor's proposed solution.
5. Submit Drawings for approval whenever job measurements and an analysis of the Drawings and Specifications by the Contractor indicate that the various systems cannot be installed without significant deviation from the intent of the Contract. When such an interference is encountered, cease Work in the general areas of the conflict until a solution to the question has been approved by the project Architect/Engineer.
6. Submit original composite coordination Drawings as part of record document submittals specified in Section 01770.

1.05 PRECONSTRUCTION CONFERENCE

- A. Attendance Required: City Engineer's representatives, Construction Manager (when so employed), Designer(s), Contractor, Contractor's Superintendent, and major Subcontractors.
- B. Submittals for review and discussion at this conference:
 1. Draft Schedule of Values, following Section 01290 - Payment Procedures.
 2. Bound draft of Airport Construction Plans, following Sections 01506 - Temporary Controls and 01555 - Traffic Control and Regulation.
 3. Draft construction schedule(s), following Section 01325 - Construction Schedules.
 4. Draft Submittal Schedule, following Sections 01325 - Construction Schedules and 01340 - Shop Drawings, Product Data and Samples.
- C. Agenda:
 1. Status of governing agency permits.
 2. Procedures and processing of:
 - a. Submittals (Section 01340 - Shop Drawings, Product Data and Samples).

COORDINATION AND MEETINGS

- b. Permitted substitutions (Section 01630 - Product Options and Substitutions).
 - c. Applications for payment (Section 01290 - Payment Procedures).
 - d. Document 00685- Request for Information.
 - e. Modifications Procedures (Section 01255 - Modification Procedures).
 - f. Contract closeout (Section 01770 - Contract Closeout).
3. Scheduling of the Work and coordination with other contractors (Sections 01325 - Construction Schedules, 01326 - Construction Sequencing and this Section).
 4. Agenda items for Site Mobilization Conference, if any, and Progress Meetings.
 5. Procedures for Daily Briefings, when applicable.
 6. Procedures for City's acceptance testing (Section 01455) and Contractor's testing (Section 01450 - Contractor's Quality Control)
 7. Record documents procedures (Section 01770 - Contract Closeout).
 8. Finalization of Contractor's field office and storage locations (Section 01505 - Temporary Facilities).
 9. Use of premises by City and Contractor (Section 01145 - Use of Premises).
 10. Status of surveys (Sections 01725 - Field Surveying and 01726 - Base Facility Survey).
 11. Review of temporary controls and traffic control (Sections 01506 - Temporary Controls and 01555 - Traffic Control and Regulation).
 12. Construction controls provided by City.
 13. Temporary utilities and environmental systems (Section 01505 - Temporary Facilities).
 14. Housekeeping procedures (Section 01505 - Temporary Facilities).
- 1.06 **PROGRESS MEETINGS**
- A. City Engineer will hold Progress Meetings weekly, or at other frequency determined by progress of the Work, at Department of Aviation office at

8800 Paul Koonce (at William P. Hobby Airport), Houston, Texas 77061 (713) 643-0632.
 - B. Attendance Required: Contractor's Superintendent, major Subcontractors' and Suppliers' superintendents, City Engineer representatives, and Designer(s), as appropriate to agenda topics for each meeting.

COORDINATION AND MEETINGS

C. Submittals for review and discussion at this conference:

1. Project schedule (Section 01325 - Construction Schedules).
2. Submittal Log (Section 01340 - Shop Drawings, Product Data and Samples).
3. Log of Document 00685 - Request for Information.

D. Agenda:

1. Review minutes of previous meetings to note corrections and to conclude unfinished topics.
2. Review of: progress schedule; coordination issues if any; corrective measures if any to regain planned progress; planned progress during succeeding work period; off-site fabrication and product delivery schedules.
3. Field observations, problems, and decisions.
4. Identification of problems which impede planned progress and Contractor's proposals for resolution.
5. Review of submittals schedule and status of submittals.
6. Review of RFI status.
7. Review of Request for Proposal, Work Change Directive and Change Order status.
8. Closings and impediments (Section 01145 - Contractor's Use of Premises).
9. Maintenance of quality and work standards (Sections 01450 - Contractor's Quality Control and 01455 - City's Acceptance Testing).
10. Effect of proposed changes on progress schedule and coordination.
11. Other items affecting completion of the Work within contracted cost and time.

1.07 DAILY BRIEFINGS

- A. In addition to Progress Meetings, hold briefings as frequently as required, at place designated by the City Engineer, to coordinate details of construction and airport operations. Discuss specific requirements, procedures and schedule changes, and closures and impediments.
- B. When required, hold briefing before start of work each day, to confirm that required activities are properly allocated and unchanged.

PART 2 PRODUCTS (NOT USED)

COORDINATION AND MEETINGS

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01321
CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Progress photographs to supplement Applications for Payment.
- B. Detail photographs and video to supplement Request for Information.

1.02 MEASUREMENT AND PAYMENT

- A. Cost of photographs is incidental to the Contract Price. No additional costs will be paid for other than administrative costs of extra copies and photographs resulting from additional station points.
- B. Following work will be paid on a Unit Price basis:
 - 1. Extra Prints: Per print.
 - a. Extra prints provided direct from the photographer to parties authorized by the City Engineer up to date of Substantial Completion, priced at prevailing local commercial rates. Include photographer's costs and Contractor's administrative costs only.
 - b. Extra prints provided direct from the photographer to the City Engineer up to 3 years after the date of Substantial Completion, priced at prevailing local commercial rates. Include photographer's costs but not Contractor's costs for this service.
 - 2. Additional Station Points: Per stationpoint, for photographs made during same trips as Paragraph 2.01.
- C. Emergencies: Per trip to site. Take additional photographs or video, as appropriate to conditions, within 24 hours of the City Engineer's request. This applies to professional photography required by conditions stated in Paragraph 8.2.1 in Document 00700 - General Conditions.
- D. Following photography will be commissioned by Modification: Publicity photographs; special events at site; photographs taken at fabrication locations off-site.

1.03 SUBMITTALS

- A. Station point Plan: One copy of the Site Plan, marked to show plan, altitude and cone-of-view of each stationpoint selected by the City Engineer or Designer. Submit at least 10 days prior to taking Preconstruction Photographs.

CONSTRUCTION PHOTOGRAPHS

- B. Preconstruction Photographs: Same as Paragraph B., except one-time only, and marked as such.
- C. Progress Photographs: 3 prints (or digital copies) on approved media of each view. Submit 2 prints and 1 color aerial photograph of the project site (or digital copies) with each Application for Payment. Retain 1 print (or digital copy) by the Contractor at the work site and available at all times for reference. Retain photographic digital files, at the photographer's office, for 3 years after Substantial Completion.
- D. Photographs and Video Supporting RFI: Identify following with RFI number and date of photographs:
 - 1. Submit 1 copy of 3x5 inch prints on white card stock in clear plastic sleeves.
 - 2. Submit video on CD's or other approved media. Include video identification number, date of record, approximate location, and brief description of record.
- E. Contract Closeout: Follow Section 01770, Contract Closeout to:
 - 1. Return electronic copies of RFI photographs and video on CD's or other approved media device, identified by Project name, Contractor, and date photographs were taken.
 - 2. Return video on CD's or other approved media device, identified with contents, by RFI number, and each CD or other approved media device numbered sequentially and with "Date From/ To" on each.
- F. Aerial Progress Photographs: Submit 5 prints and 1 CD of 2 consistent oblique views with each Application for Payment. Retain 1 print by the contractor at the work site and available at all times for reference. The photos shall be large format oblique angles taken from a height and viewpoint to be selected by the City Engineer.

1.04 QUALITY ASSURANCE

- A. Timely take and produce photographs from proper station points and provide proper image quality.
- B. Cooperate with the photographer's work. Provide reasonable auxiliary services as requested, including access and use of temporary facilities including temporary lighting.
- C. Qualifications of Photographer for General Progress Photographs: A firm or individual of established reputation regularly engaged as a professional building or scene photographer for not less than 3 years.
- D. Qualifications of Photographer for RFI Photographs and Video: An employee of the Contractor knowledgeable in photography and videotaping technique, including proper use

CONSTRUCTION PHOTOGRAPHS

of video pan-zoom, close-ups, lighting, audio control, clear narrative, smooth transition between subjects, and steady camera support.

- E. Qualifications of Aerial Photographer: A firm or individual of established reputation, regularly engaged in aerial photography with prior experience at IAH.

PART 2 PRODUCTS

2.01 MEDIA

- A. Fixed-Film: 35mm color print film or color slide film, as determined by City Engineer; ASA 100 minimum, higher when required by lighting conditions.
- B. Paper Prints:
1. For Progress Photographs: 8x10 inch matte-finish color, in clear plastic envelop with reinforced 3-ring binding.
 2. For RFI Photographs: 3x5 inch minimum size, matte-finish color, contact-mounted on flexible white paper card stock in clear plastic envelop with reinforced 3-ring binding.
- C. Video: Approved playable PC digital format; record at slowest speed or speed capable of freezing a clear image on "Pause"; date and time stamp as part of recording process. Use audio function for slate data below.
1. Provide color playback equipment at Contractor's site office, with minimum 13-inch (diagonal) screen size.
- D. Bitmapped (Digital) Images: TIFF, JPG, PNG, GIF, JPEG, BMP, TGA, or TIFF format, maximum 1280x480 and minimum 480x480 pixels, digitally date and time stamped.

2.02 PRECONSTRUCTION, PROGRESS AND RFI PHOTOGRAPHS

- A. Preconstruction Photographs: Prior to beginning on-site construction, take five sets of fixed-film photographs of the project area from approved stationpoints. Show condition of existing site area, and particular features as directed, within contract limits.
1. At exterior views, surrounding situs, showing streets, curbs, esplanades, landscaping, runway, taxiway and apron pavement.
 2. At interior views, surrounding situs, showing floors, walls, ceilings and architectural signs.
 3. Take pan-view photographs as required to encompass existing conditions.

- B. Progress Photographs for Applications for Payment: Take 3 fixed-film photographs from each of 2 station-points (same station points each time to show a time-lapse sequence), coinciding with the cutoff date associated with each application for payment, and at Substantial Completion of each stage of the Work.
- C. Photographs and Video for Request for Information: Take photographs and video as required to support Document 00685, Request for Information:
 - 1. Details of existing conditions before construction begins.
 - 2. Details of construction.
 - 3. Details of damage or deficiencies in existing construction and work of separate contractors.
 - 4. Take number of images as required to fully show conditions.

PART 3 EXECUTION

3.01 GENERAL

- A. Do not record over previous video records.
- B. Provide clear, sharp, vibration-less video data and clear audio without detrimental background noise.

END OF SECTION

SECTION 01325
CONSTRUCTION SCHEDULES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.
- B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.
- C. City of Houston (City) Policies, Standards and Procedures, as applicable.

2.01 SECTION INCLUDES

- A. Project Schedules and Progress Reporting
- B. Construction Sequencing and Phasing

3.01 DEFINITIONS

- A. Contractor: With respect to the Division 01 requirements, the entity contracted by the City to deliver the preconstruction and construction services defined in the Contract Documents.
- B. Design Consultant - Person or firm and its authorized representatives, under contract with the City, to provide professional services during pre-construction and construction.
- C. Project Scheduling Techniques
 - 1. CPM: Critical Path Method
 - 2. PDM: Precedence Diagramming Method
- D. Section Definitions
 - 1. **Activity:** A discrete element of Work or task performed during the course of the Project. Each schedule activity shall be clearly defined depicting duration, start and finish dates, logic links to predecessor and successor activities and supported by defined resources where applicable. The activities shall be detailed in such a way,

CONSTRUCTION SCHEDULES

- that they shall support the planning and measurement of physical percent complete for the purposes of Earned Value Management reporting.
2. **Baseline Schedule:** The schedule prepared by the Contractor and approved by the City which is the basis for representing the full scope of Work, the time scales and phasing for delivery, providing a means against which progress can be determined.
 3. **Commissioning and Integration Testing Schedule:** Activities contained within the Project Schedule depicting startup, testing and commissioning phase of the Project, including activities associated with the transition to revenue service and required for achievement of Final Acceptance.
 4. **Constraint:** Scheduling restriction imposed on start or finish of an activity. A constraint restricts the movement of an activity based on the type of constraint and the date used and may override the logic relationship also assigned to the activity.
 5. **Construction Schedule:** Activities within the Project Schedule which depicts the construction activities performed or to be performed by the Contractor as a part of the Project.
 6. **Contractor's Project Management Plan:** A formal document prepared by the Contractor and approved by the City which describes how the Project will be planned and progressed and delivered by the Contractor and the necessary reviews and acceptances by the City.
 7. **Cost Breakdown Structure:** The breakdown structure the Contractor shall use to distribute contract costs in the various estimates, Schedule of Values and in alignment to the Work Breakdown Structure.
 8. **Critical Path Method (CPM):** Scheduling technique utilizing activities, durations, and interrelationships/dependencies (logic), such that activities are interrelated with logic ties from the beginning of Project to Final Acceptance.
 9. **Data Date:** Date when the status of schedule activities is determined for a Monthly Progress Schedule report. Any data prior to the Data Date is considered historical information and data after is the forecast of remaining work.
 10. **Design Schedule:** Activities within the Project Schedule which includes the design activities of the Project. The Design Schedule shall demonstrate the interdependence between design activities and the Owner's requirements. The Design Schedule shall also demonstrate the relationships between design activities and the requirements to successfully deliver the activities within the Construction Schedule.
 11. **Float:** The term "float" shall refer to "end float", also called "terminal float" End or terminal float is the period by which the finish of the longest path through a schedule

CONSTRUCTION SCHEDULES

- (the critical path) can be delayed, brought forward, or extended without affecting the completion date.
12. **Float Suppression:** Any technique that causes an activity to show less float, including but not limited to, as late as possible constraints and unnecessary lags.
 13. **Fragnet:** A group of interrelated activities taken from or to be added to a Schedule that can stand on their own representing only a portion of a CPM schedule. For example, a Fragnet can be used to portray a scope of work being added to, or changed from, a Project Schedule.
 14. **Key Plans:** Graphic representations on prints of Contract Documents of Contractor's planned breakdown of Project for scheduling purposes. Key plans shall clearly define boundaries of work for each designated segment, locations, and sub-locations. Alphanumeric codes on plans shall match code values for activity code designation in the Project Schedule.
 15. **Lag:** Time that an activity follows or is offset from the start or finish of its predecessor.
 16. **Materials Plan:** A plan for purchase, fabrication, delivery, storage and issuing of materials and products to the Project which must be integrated into the Project Schedule.
 17. **Look-Ahead Schedule:** An element schedule prepared by the Contractor detailing the status of the work as of the Progress Date and Contractor's plan for executing the remaining work before recalculation and/or re-sequencing.
 18. **Longest Path:** The Longest Path is the Path through a Project network from start to finish where the total duration is longer than any other path. The Longest Path is determined by the string of activities, relationships that push the Project to its latest early finish dates.
 19. **Monthly Progress Schedules:** The updates to the Project Schedules prepared by Contractor and submitted to the City on a monthly basis with the Application for Payment. There are two versions of Monthly Progress Schedules submitted; a Progress Only (PO) version and a Contractor Adjusted (CA) version.
 20. **Preconstruction Schedule:** An element of the Project Schedule prepared by the Contractor which includes activities prior to approval to proceed with construction activities.
 21. **Project Schedule:** A CPM Schedule prepared by the Contractor that includes all elements of the Scope of Work of the Contract. The Project Schedule clearly identifies all relationships that exist within the Scope of Work. The Project Schedule

CONSTRUCTION SCHEDULES

- communicates the sequencing of the multiple phases of work. The Project Schedule identifies interfaces, both internal and external to the Scope of Work of the Contract. The Project Schedule encompasses the Baseline Schedule, Look Ahead Schedules, Delivery Phase Schedules (Design, Procurement, Detailing, Fabrication, Shipment, Installation, Construction, Startup, Testing and Commissioning), updated or revised Baseline Schedules. The Project Schedule also includes Monthly Progress Schedules, Proposed Schedules, Schedule Fragnets, Recovery Schedules.
22. **Program Schedule:** When multiple Projects are logically linked into a Program, the Program Schedule is prepared by the City and incorporates all the interrelated projects by combining the individual Project Schedules. Project Schedules become element schedules of the Program Schedule.
 23. **Proposed or Preliminary Schedule:** A schedule prepared by Contractor, prior to approval of the schedule by the City and subsequent incorporation into the Project Schedule. Also referred to as Draft or Initial Schedule.
 24. **Recovery Schedule:** A schedule prepared by the Contractor and to be approved by the City which details the Contractor's plan for recovery of time lost on the Project and associated costs.
 25. **Revised Baseline Schedule:** A revision to the Baseline Schedule that is necessitated to accurately reflect a significant change in scope or phasing of the scheduled Activities. The Baseline Schedule shall not be revised without prior approval by the City.
 26. **Status Data Date:** The "as-of" date up to which all progress has been updated and reflected in the Status report. The Status Data Date is also the date from which a Look-ahead Schedule predicts future activities and progress.
 27. **Submittal Schedule:** A register (list) of the Submittals to be made for materials, products, shop drawings, plans which is prepared by the Contractor and includes durations needed for submittal, reviews and processing. The dates and durations are to be coordinated with the associated activities within the Project Schedule.
 28. **Delay Analysis:** Technique that demonstrates comparison of time impact for each schedule revision or proposed revision against the current Project Schedule. Methodology shall follow Association for the Advancement of Cost Engineering International (AACEI) Delay Analysis as applied in Construction (Recommended Practice No. 52R-06.) as a guideline or method submitted by the Contractor and approved by the PMT.
 29. **Work Breakdown Structure (WBS):** A deliverable-oriented breakdown of a project into decreasingly smaller components, also described as a hierarchical decomposition of the project team's work into manageable sections.

CONSTRUCTION SCHEDULES

30. **Working Day:** Day scheduled for active execution of Work in the Project Schedule Calendar in accordance with the Contract and as approved by the City.

4.01 SUMMARY

A. Acceptance of Schedule Requirements by Contractor

1. The Contractor accepts the responsibility to complete the project on time as called for in the contract.

B. Schedule Requirements

1. The Contractor is responsible for determining the sequence of activities, the time estimates for the detailed construction activities and the means, methods, techniques and procedures to be employed. The Project Schedule shall represent the Contractor's plan of how it will prosecute the Work in compliance with the Contract requirements. Contractor shall ensure that the Project Schedule is current and accurate and is properly and timely monitored, updated and revised as Project conditions may require and as required by the Contract Documents. Unless the context indicates otherwise, the term "schedule" used herein will be read to include updated schedules.
2. Schedules shall contain logic and necessary components to perform Critical Path Method (CPM) network analysis. Contractor's schedule shall also be able to illustrate Precedence Diagramming Method (PDM).
3. Contractor shall include in the Project schedule contractual milestones and all interface points with City, Design Consultant(s), Subcontractors, Suppliers, and other Contractors. These points shall be in the form of Start Milestones for deliverables due to the Contractor from others, and as Finish Milestones for deliverables that Contractor must supply to City, Design Consultant(s), Subcontractors, Suppliers and other Contractors. Finish milestones must be determinate by predecessor activity, not by constrain.
4. Schedule shall contain activities for preparation and approval of contractor's design and submittal deliverables. Procurement, fabrication and delivery of mayor materials and long lead items. Obtain permits and construction activities.
5. Contractor shall allocate duration uncertainty to the scheduled activities within the contract schedule to enable a Quantitative Schedule Risk Analysis (QSRA) to be performed by the Program Management Team. Duration uncertainty (minimum duration, maximum duration, most likely duration) according to the relevant risk exposure shall be captured by the contractor against the scheduled activities. The PMT must rely on the data being supplied by the Contractor and incorporated and updated in line with the monthly schedule update process.

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6. Contractor shall utilize the most current version of Primavera P6 (15.1 or Later) for all schedules governed by these provisions.
7. The Contractor is responsible for assigning appropriate material, equipment and labor resource loading of the key quantities necessary to execute the activity. This will demonstrate realistic productivity rates as well as measure and report Key Performance Indicators (KPIs).
8. The City Engineer reserves the right to reject any schedule or report that fails to realistically or satisfactorily reflect completion of the Project scope of work or any agreed intermediate milestone. Failure of the Contractor to deliver satisfactory schedules or reports as required in the Contract Documents may result in actions by the City General Conditions.
9. The schedule shall show all activities in Work Days, with allowance for holidays or other periods when work is not permitted to be performed.
10. Detailed schedule requirements shall be contained within the City Policies, Standards and Procedures).
11. Contractor shall prepare schedules which assure that all work sequences are logical, and the network shows a coordinated plan for complete performance of the Work. Failure of the Contractor to include any element of work required for performance of the Contract in the network shall not excuse the Contractor from completing all Work within the Contract Time.
12. Contractor must have an approved workhour plan as noted in the approved Work Authorization Notification (WAN) prior to commencing work on the project site. Changes to the approved work-hours plan shall require 48-hour written notice and subsequent written approval by the City.

5.01 SUBMITTAL REQUIREMENTS

The Contractor must utilize the City's web-based application management system for submittals. The Project Manager will coordinate training and access to the web-based application management system. The submittal processes are further defined in Section 01330 Submittal Procedures and in the City Policies, Standards and Procedures, as applicable.

- A. In addition to the PDF versions of the schedule required in this Section, submit one electronic copy of schedule in Primavera compressed format (.XER). Filename shall have a unique identifier and shall include a sequential number for each monthly update. PDF prints and reports shall be generated from same version of the Schedule that is provided in electronic form.
- B. Submittal of Contractor Schedules

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1. Submit Preconstruction Schedule for approval within 30 days of NTP for Preconstruction Services
2. Submit the initial proposed Project Schedule for approval as a Baseline Schedule within 30 days of NTP for Construction Services.
3. Submit Monthly Progress Schedule and Narrative no later than 12:00 noon (local time) on the Wednesday before the last Friday of the month. The Data Date for the Monthly Progress is 00:00 hours on the Saturday following the last Friday of the Month. The Monthly Progress Schedule is required for each Application for Payment. Contractor may request to meet with the City prior to the submittal of the Monthly Progress Schedule and Application for Payment to resolve issues prior to submittal.
4. The weekly 3 weeks Look-Ahead Schedule shall be submitted every Tuesday at 08:00 hours with the previous week's progress updated. The Status Date of the Look-Ahead Schedule shall be the previous Saturday at 00:00 hours, progressed weekly.
5. Submit Delay Analysis per the ACEI recommended practice 52R-06 as follows:
 - a. Within ten work days after receipt of written change modification.
 - b. Within ten work days after receipt of written notice by City.
 - c. Within ten work days from beginning of delay caused by unforeseeable circumstances.
6. Submit Recovery Schedule following the event of a forecast delay. Contractor shall submit a Recovery Schedule within the 21 calendar days of Contractor receiving City's written request that is resource and cost justified indicating how the Contractor will recoup the impacted contract time.
7. Submit an As-Built Schedule within 30 work days after the City's Final Acceptance of the Work.
8. Submit a Submittal Log as a supplement documents for Monthly Progress Schedule, showing all submittals for products, materials, plans, and shop drawings, RFI's and administrative submittals required per the Technical Specifications including associated Specification Section numbers and headings.
 - a. Include durations and dates for processing by Reviewers and/or other parties as required. Indicate submittals requiring special processing such as short-duration reviews.
 - b. The Contractor shall coordinate packaging of individual submittals in a logical and organized fashion so that they may be reviewed in part or in whole with related

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elements of work with the Reviewers.

- c. Include durations and dates based on frequency of Contractor's submittals to City for items such as of administrative submittals such as Applications for Payment, Labor Reports, Safety Reports, MWBE Reports.

6.01 SCHEDULE CONTROL PROCEDURES AND QUALITY ASSURANCE

A. Control Procedures

1. Procedures for schedule control shall be included in the Contractor's Project Management Plan as part of the plan implementation and reporting requirements. Prior to submission of Monthly Progress Schedule contractor should call for scheduling workshop with Houston Airports to propose schedule changes to remove out of sequence logic and to present accurate critical path. Allowed changes are only for removing or adding logic links. Changes in original durations, resources etc. are not permitted. After approval of schedule changes contractor can proceed with Monthly Progress Schedule submission. All changes must be recorded in schedule change control log and submitted as supplementary document in Monthly progress report.
2. If any in-progress activity is delayed for any reason, that activity will be split to track the reason for the delay. A separate activity for the delay will be created and placed in between the split.
3. Procedures for preparing and monitoring the Project Schedule and other required reporting.,
4. Procedures for performing quality oversight of the schedule review/forecast.
5. Earned Valued Methodology Procedures shall be implemented for performance measurement using data from the schedule to provide an effective means of comparing Work scheduled/planned versus Work performed. Please see Section 0 Section 01 32 16, 1.3.D1.Provide, as a minimum, a continuous review of actual progress against the most recent Project Schedule. This is to assure that revised resource allocation and/or other corrective action can be considered and undertaken proactively and as early as possible.

B. Qualifications of Contractor's Scheduler

1. Contractor shall have within its employ or under separate Contract, throughout the execution of the Work under this Contract, such expertise in CPM scheduling and P6 software so as to insure its effective and efficient performance under this Specification. It shall be the responsibility of the Contractor to prepare input information for the Contract Schedule, monitor progress, provide input for updating

CONSTRUCTION SCHEDULES

and revising logic diagrams when necessary and otherwise fulfilling its obligations hereunder. Contractor shall submit the qualifications of the CPM Specialist for acceptance by the City.

7.01 SCHEDULING PRINCIPLES AND REQUIREMENTS

A. General

1. Contractor shall prepare the Schedules identified in this Section during the performance of Contract. The Schedules shall:
 - a. Be detailed, time-scaled, computer-generated schedules, using the Critical Path Method, that accurately depict activities representing each portion of the Work from the current Data Date through Final Acceptance.
 - b. Be used for planning and coordinating the Work.
 - c. Be the basis for reporting all the Work to be performed in fulfillment of the Contract Documents.
 - d. Accurately depict the Contractor's current logical activity sequences and activity durations necessary to complete the Work in accordance with the requirements of the Contract Documents.
 - e. Assist Contractor and City in preparation and evaluation of Contractor's monthly progress payments.
 - f. Assist the City in evaluating progress (including payment) of the Work.
 - g. Assist Contractor and City in monitoring progress of Work and evaluating proposed changes to the Contract and requests for additional contract time.
 - h. Provide for optimum coordination by Contractor of its trades, Subcontractors, and Suppliers, and of its Work with the Work or services provided by any separate Contractors.
 - i. Permit the timely prediction or detection of events or occurrences which may affect the timely prosecution of the Work.
 - j. Provide a mechanism or tool for use by the City, and Contractor in determining and monitoring any actions of the Contractor which may be required in order to comply with the requirements of the Contract Documents relating to the completion of the various portions of the Work by the Contract Time specified in the Contract Documents.
2. Contractor shall include in the Contract schedule all interface points with City, Design

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Consultant(s), Subcontractors, Suppliers, and other Contractors. These points shall be in the form of Start Milestones for deliverables due to the Contractor from others, and as Finish Milestones for deliverables which Contractor must supply to City, Design Consultant(s), Subcontractors, Suppliers and other Contractors. The PMT will assist in obtaining the relevant data from other parties when required.

3. Contractor shall provide to the City duration uncertainty and risk events for scheduled activities within the contract schedule to enable a Quantitative Schedule Risk Analysis (QSRA) to be performed by the City. Duration uncertainty (minimum duration, maximum duration, most likely duration) according to the relevant risk exposure shall be captured by the contractor against the scheduled activities.
4. Calendar
 - a. Anticipated work and non-work periods shall be included for each activity.
 - b. Agreed Holidays shall be included as non-work days assigned to the appropriate day as they occur.
 - c. Anticipated Weather Lost Days
 - d. As the basis for establishing a “Weather Calendar”, use the National Oceanic and Atmosphere Administration’s (NOAA) historical monthly averages for days with precipitation, using a nominal 30- year, greater than 2.5 mm 0.10-inch amount parameter, as indicated on the Station Report for the NOAA location closest to the project site. In addition, incorporate into the Weather Calendar, other non-workdays such as Saturdays, Sundays and Federal Holidays.

B. Activities

1. Contractor shall use and/or implement generally accepted recommended industry practices and the City Policies, Standards and Procedures, as applicable.
2. Schedule activities shall be sufficiently named or titled to include what is to be accomplished and identified by the applicable work areas. Activities shall be grouped to assist in the understanding of the activity sequence. Examples of the types of activities to include in each schedule are as follows:
 - a. Design Activities: If and when Contractor has responsibility for the design as a part of the Contract, design activities shall be logically tied to the Construction Activities without constraints and Contractor shall develop an agreed design progress and performance measurement system based on design package deliverables and division of responsibilities. At a minimum, design work shall be divided to have an agreed number of deliverables per area/facility/system/subsystems and the governing jurisdictions. Actual design

packaging scheme shall be agreed upon with the City prior to implementation. When Contractor does not have responsibility for design as a part of the Contract the design activities shall be logically tied to the Construction Activities as start Milestones. Include Contractor's agreed design packaging scheme to support timely procurement of material, obtaining permits, and construction plan and include:

- 1) Agency review and approval cycles based on applicable Governmental Persons, Authority(s) Having Jurisdiction (AHJ) and other applicable Laws, Regulations, and Ordinances.
 - 2) Activities for each design phase (Concept, Schematic (30%), Design Development (60%) and Issued for Permit and Issued for Construction (100%) documents.
 - 3) Application for, and receipt, of required permits.
 - 4) Contractor's submittal of design and construction documents for City review and approval.
 - 5) Design review cycles and logical ties to subsequent fabrication, delivery, and construction activities.
 - 6) Other design related deliverables.
- b. Procurement Activities: Contractor's procurement activities included in schedules shall be logically tied with no constraints and shall be resource and cost loaded. Examples of Procurement activities include, but are not limited to:
- 1) Bid and award cycles.
 - 2) Shop Drawing development and approval.
 - 3) Equipment and Materials submittal preparation and approval
 - 4) Equipment and Materials, fabrication, factory acceptance testing, and delivery.
 - 5) Purchased and Stored Material/Equipment.
 - 6) Material/Equipment delivery requirements by the City.
- c. City Activities: Activities of City and other third-party activities shall be clearly identified in the Project Schedule. These activities include, but are not limited to, the following and the precursor processes:

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- 1) Right-of-Way property acquisition and site access.
 - 2) Submittal reviews.
 - 3) Inspections and tests as necessary.
 - 4) Environmental permit approvals by regulators.
 - 5) Notice to Proceed.
 - 6) Delivery of City-furnished material/equipment.
- d. Construction Activities: Construction activities shall be resource and cost loaded as described in this Section and shall include, but not be limited to:
- 1) Mobilization or demobilization.
 - 2) Installation of temporary and permanent Work by trades, areas, and facilities as described in the Contract Documents.
 - 3) Activities to describe the Work in sufficient detail identified according to the WBS.
 - 4) Testing and inspections of installed work by technicians, inspectors or engineers as well as the outages.
 - 5) Final clean-up.
 - 6) Scheduled Substantial Completion.
- e. Commissioning and Integration Testing Activities shall be resource and cost loaded and shall include, but not be limited to:
- 1) Start-up and Testing of equipment and systems.
 - 2) Commissioning of building and related systems.
 - 3) Scheduling of specified manufacturer's representatives.
 - 4) Dynamic Testing Readiness.
 - 5) Pre-Final inspection.
 - 6) Final Acceptance inspection.

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- 7) System Demonstration Performance Tests.
- 8) Training to be provided.
- 9) Administrative tasks and processes necessary to start, proceed with, accomplish, or finalize the Work.

C. Activity Durations:

1. Contractor shall maintain individual schedule activity durations of 20 work days or less.
2. Activities exceeding 20 work days in duration shall contain appropriate production projections so that entries can be maintained, and remaining durations adjusted according to physical progress.
3. Items such as Procurement, Fabrication, and Delivery activities may exceed 20 work days with the approval of City.
4. The Contractor is not permitted to modify (increase or decrease) an activity's original duration after it is approved by the City. During the monthly updating process, only the activity's remaining duration may be modified.

D. Summary Level Activities

1. Contractor may use Summary Level activities to represent the Work under the following conditions:
 - a. In the Preconstruction Schedule, those activities starting at least 180 days after the NTP or as otherwise agreed with the City.
 - b. In the Project Schedule and Monthly Progress Schedules, those activities starting at least 360 days after the NTP or as otherwise agreed with the City.
 - c. Summary Level activities should not exceed 90 work days without City approval and shall match the Work Breakdown Structure.
 - d. All Summary Level activities shall be detailed and supported by appropriate key resource information resource and cost loaded as agreed to in the Scheduling Conference.
 - e. Contractor shall replace Summary Level activities in the Preconstruction and Proposed Project Schedule with detailed activities through an updating process as the information becomes available and as the above-defined or agreed day limits roll forward.

2. Activity Relationships/Use of Constraints, Lags and Milestones

- a. Except for the Notice to Proceed and Project Completion milestone activities, no activities shall be open-ended, open-start or open finish. Each activity shall have predecessor and successor relationships to present sequence of work and movement of resources (hard and soft logic). Once an activity exists on an approved Project Schedule it may not be deleted, renamed, or renumbered, unless approved by City.
- b. Finish-to-Start relationships shall be the primary relationship used in all Project Schedules unless valid reasons are demonstrated for other logic relationships. Start-to-Start with lags shall be permitted provided the lag is updated and no gaps exist between contiguous activities due to the lag. Activities linked to successors only with Start-to-Start relationships shall not be permitted and must also include a Finish-to-Start or Finish-to-Finish relationship with one or more successors. Finish to Start relationship with lag shall not be permitted.
- c. Lags shall not be used when the creation of an activity will perform the same function (e.g., concrete cure time). Use of lag must be minimized and restricted to only those situations where it is not possible to properly define the start or finish of an activity by the use of a normal Finish-to-Start, Start-to-Start or Finish-to-Finish relationship. Duration of a lag shall not exceed the duration of the predecessor activity. Negative lags shall not be permitted. Contractor shall identify any lag proposed and provide an explanation for the purpose of the lag in the activity notebook and Narrative Report.
- d. Date/time constraints, other than those required by the Contract Documents, shall not be used unless jointly agreed to by City and Contractor. If Contractor seeks approval to include constraints in the schedule, Contractor shall identify any constraints proposed and provide an explanation for the purpose of the constraint in the activity notebook and Narrative Report.
- e. Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in the CPM scheduling software system. Actual Start and Actual Finish dates shall be included on the Monthly Progress Schedule and shall be consistent with other project reporting, such as daily reports, and the Contractor's monitoring and performance measuring system. In-progress activities will be updated by revising the activity's remaining duration according to actual measured or estimated work progression.
- f. Allowable activity dates are early start, late start, early finish, late finish, actual start, and actual finish. Use of activity dates such as "expected" are prohibited.
- g. Float Suppression techniques (i.e. as late as possible constraints) shall not be allowed. All Float shall be shown in the Project Schedule. Float shall be

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monitored, accounted for, and maintained in accordance with this Section.

- h. Activity constraints or use of activity durations, logic ties and sequences unapproved by the City shall not be used in any Project Schedule.
3. Resource Loading Project Schedule
 - a. The Activities within the construction schedule shall be resource loaded with key quantities and updated on a weekly basis to track the production of construction activities. The update of key quantities will be used to track Key Performance Indicators (KPIs) set forth by the PMT.
- E. Software Settings
1. De-Link Remaining Duration and Percent Complete. Construction activity progress will be calculated using Remaining Duration and Physical Percent Complete.
 2. Set Resource Data to “Two decimal places”.
 3. All activity durations and Float values will be shown in days.
 4. Schedule calculations and Out-of-Sequence progress (if applicable) shall be handled through Retained Logic, not Progress Override and not Actual Dates. Out- of-Sequence activities shall be updated to reflect actual project conditions.
 5. Date format will be DDMMYY (i.e., 01DEC15.)
 6. Default activity type will be set to “Task Dependent”.
 7. The Duration Type for each activity shall be set to "Fixed Duration and Units" before assigning any costs or resources to the activity.
- F. Activity IDs
1. The naming and coding of activities will strictly be per the City policies, standards and procedures, as applicable. Activity IDs shall be provided for each Activity with up to 15 characters as detailed in the City Policies, Standards and Procedures, as applicable. The purpose of the structure for the Activity ID is for easier identification and for improved organization in all Project Schedules. Each part of the ID will also need to be included in the schedule as an activity code.
 2. Activity IDs shall not be deleted and/or re-assigned. If during the course of the project, an activity is needed to be deleted, that Activity shall move to the inactive WBS titled “Deleted Activities” in order to avoid re-using of the same Activity IDs, should the need of adding new activities arise.

3. Activities to be deleted: Remove logic, relationships and Activity Codes.

G. Activity Names

1. Activity

- a. Location - Verb Names shall be brief but shall convey the scope of work described. Non- Standard abbreviations shall be explained in the Narrative Report. Percentages shall not be used in activity descriptions (e.g., Pour West Footing (0 - 50%)) unless the City agrees with the use of percentage for a particular activity. Contractor shall submit samples of activity names for approval prior to establishing the schedule.
- b. All activities shall have a unique activity name/description.
- c. Activity names can only be modified to add detail describing an activity's scope, correct the spelling or grammar, or to improve for clarity, but cannot be revised to completely change the scope of the activity.
- d. Each activity name should follow the following format:
 - (1) Noun.
 - (2) Station numbers, column numbers, or other description for the location, may be included at the end of the activity name if it will provide a better description of the activity.
- e. Example values for Location include but are not limited to:
 - (1) Segment Number.
 - (2) Column Line Numbers.
 - (3) Stationing Value.
 - (4) Other Unique Identification schemes.
- f. Examples of Verbs include, but are not limited to:
 - (1) Design.
 - (2) Install.
 - (3) Procure.

- (4) Fabricate.
- (5) Deliver.
- (6) Erect.
- (7) Describe the work being performed.

H. Work Breakdown Structure

1. Activities in Project Schedules shall be tied to the Work Breakdown Structure as provided in the City Policies, Standards and Procedures, as applicable.

I. Activity Codes

1. The purpose of the activity codes is to further sort and filter the schedule activities to enhance reporting capability. The activity codes required include both those that are already part of the Activity ID and those that are not.
2. Activities shall be coded as indicated in the City Policies, Standards and Procedures, as applicable.

J. Resource Loading

1. Resource loading shall be done on every construction activity, representing quantifiable work or materials of that Work Package.
2. Each resource-loaded activity shall have an estimate of the key quantities.
3. Failure to incorporate resource loading and establish planned productivity and/or production rates (defined as the planned quantity of work to be executed in a given time), may result in the Contractor's waiver of any right to compensation and time extension for loss of productivity. Submission of any such claim may be rejected for failure to establish baseline productivity by which any claimed loss would be measured.
4. Failure to incorporate resource loading and establish planned productivity may also result in the rejection of any schedule by the City Engineer.

K. Schedules as the Basis for Payment

1. The approved Project Schedule of Values shall be the basis for monitoring and calculating the Contractor's progress during each update period and therefore the amount of each progress payment. Lack of an approved Project Schedule or Monthly Progress Schedule Update will result in the inability of the City to evaluate contract

progress for the purposes of payment. Failure of the Contractor to provide all information, as specified in this Section, will result in the disapproval of the Monthly Progress Schedule (City Engineer may decline to certify payment and may withhold request for payment in whole or in part as set forth in the General Conditions, Article 9, Subparagraph 9.7.3.).

2. Percent complete for activities in the Schedule of Values shall be based on proportion of the overall quantity of the physical work complete. Contractor and City to jointly assess and agree on actual values for easily discernible units of measure (square feet, each, linear feet) on a weekly basis.

L. Cash Flow Report

1. The Contractor shall generate Cash Flow Reports based on each submitted Project Progress Schedule. Report shall be grouped and formatted to be consistent with the approved schedule of values from the contract. Reports shall indicate a time-phased distribution of Schedule of Values. Alternate Cash Flow Reports, if requested by the PMT, shall be submitted for approval prior to submission of the first report.
2. The Cash Flow Report shall display in tabular and graphic format, projections of monthly values of anticipated cost. Each schedule of values line item is to be represented within the project. The Cash Flow Report should also contain the adjusted forecast of estimated costs to achieve completion of the project.

M. Use of Float

1. Float shall be monitored and accounted for. The Float in any schedule shall not be considered for the exclusive use of either the City or Contractor; rather it is for the benefit of the Project. As such, Float is considered an expiring resource available to both parties on a nondiscriminatory basis, so long as the parties act in good faith and work in the best interests of completing the Project on time.

N. Contractor and City Responsibilities for Schedules and Acceptance

1. Any schedule or schedule update rejected or otherwise marked by the City as requiring revision and resubmission shall be revised by the Contractor and resubmitted within 5 days of such revision or resubmission Notice by the Project Manager. Any schedule or schedule update that has not been approved or accepted is presumed lacking a reasonable degree of accuracy and will not be considered by the City to be reasonable, feasible, or accurate when used by Contractor as a basis for a Time Impact Analysis or other type of delay analysis or claim.
2. If Contractor fails to submit its initial construction schedule or monthly schedule updates, or any such schedule or updates are not acceptable to the City, the City Engineer or Director may take such action to decline certifying payment and may

withhold request for payment in whole or part) as set forth in Article 9 - General Conditions, §9.7.3 or any other remedy set forth in the Contract or at law of equity.

3. Contractor Responsibilities

- a. Contractor shall have the responsibility to develop and update the schedules according to all requirements described herein. All schedules shall accurately represent to the City the Contractor's plan for execution of Work. Contractor shall use the most current Project Schedule to execute the Work in compliance with Contract Documents.
- b. In developing and updating the Project Schedules, Contractor represents that it shall require its Subcontractors to actively participate in such development and updating processes. The Contractor represents that all schedules are consistent with Contractor-approved Subcontractor schedules with sufficient agreed details.
- c. Contractor is required to provide its Subcontractors' schedules and updates in native format upon request by City.
- d. Costs incurred by the Contractor in complying with the requirements of this Section or other scheduling obligations contained in the Contract Documents, including but not limited to Contractor's Scheduler, and preparation of all Project Schedules, creation of Recovery Schedules, and the preparation of Time Impact Analysis shall be included in the Contract Price, and shall not be the subject of requests to the City for contractual relief.

4. City's Responsibilities

- a. All Project Schedules shall be submitted to the City for review and approval, consistent with the specific requirements set forth herein. The City shall have the right to disapprove any schedule if the schedule fails to comply with the requirements herein, provided, that such disapproval is based on a reasonable determination by the City that such schedule contains deviations from the specifications. City shall have the right to waive what it considers to be, in its sole discretion, minor defects in a schedule. City recognizes its responsibility to act in a reasonable manner with respect to approvals and agrees that approvals shall not be unreasonably withheld (i.e. for matters that do not impact the effective functioning of the schedule.)
- b. Any approval by City of the schedules submitted by the Contractor to City shall mean that in the opinion of the City, Contractor has complied with the requirements of this Section. No such review shall release or relieve the Contractor from full responsibility for the accurate and complete performance of the Work, including the accuracy and completeness of the schedules, or any other duty, obligation or liability imposed on it by the Contract including, the responsibility

for completing the Work within the time set forth in the Contract. The review or approval will not constitute a representation by City that the Contractor will be able to proceed or complete the Work in accordance with the dates contained in submitted schedule.

- c. In reviewing schedules submitted by designers, contractors, or others, the City will review the schedules to determine if the respective schedule appears “feasible and reasonable”; and, determine if the services or work could logically be accomplished in the time frames allotted in the schedule. Approving, accepting, or assenting to (hereafter referred to collectively as “approval” or “approving”) a schedule only means that the City considers that the schedule appears “feasible and reasonable.”
 - d. By approving a schedule, the City is not agreeing that the work or services will be accomplished according to and within times set forth in the schedule. Nor by approving a schedule does the City accept or bear some responsibility or liability if the work or services are not accomplished according to and within times set forth in the schedule or if factors upon which the schedule is based thereafter change during the execution of the works or services. Approval of any schedule showing completion beyond milestone dates and/or beyond contract completion times indicated in the contract shall not change any milestone or completion times in the contract and approval of a schedule is without any prejudice to the rights of the City.
- O. Schedule Workshops and Review Meetings
- 1. A record of all Schedule Workshops and Schedule Review Meetings shall be made by the Contractor stating the place and time of the meeting, the names and identification of those present, and a description of the topics discussed, and the agreements reached. Meeting minutes for these meetings, subject to the City’s review and approval, shall be prepared immediately after the meeting and issued within three days, with distribution to the City and all attendees.
 - 2. Project Scheduling Workshops:
 - a. Proposed Schedule Workshop
 - b. Contractor shall meet with the City within 14 days after the Notice to Proceed for Preconstruction Services to conduct a Post-Award Kick-Off Meeting and Project Scheduling Workshop to review and coordinate schedule requirements 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 physical constraints to the project, including phasing, work stages, area separations, and interim milestones.
- (4) Review delivery dates for City-furnished products.
- (5) Review of Contractor and Subcontractor procurement cycles and their work plans.
- (6) Review schedule for work of the City's separate contracts.
- (7) Review submittal requirements and procedures.
- (8) Review time required for review of submittals and re-submittals.
- (9) Review requirements for tests and inspections by independent testing and inspecting Governmental Authority(s)
- (10) Review time required for Project closeout and City startup procedures, including commissioning activities.
- (11) Review and finalize list of construction activities to be included in schedule.

c. Baseline Schedule Workshop

- (1) Contractor shall meet with the City within 30 days after the Notice to Proceed for Construction Services to conduct another Post Award Kick-Off Meeting and Project Scheduling Workshop. This Workshop shall involve scheduling personnel from Contractor and City with the objective of working together to establish procedures for the development of the Baseline Schedule, and to ensure that the City requirements are satisfied and to review and coordinate schedule requirements Contractor shall present the draft Baseline Schedule including a description of intended methodology and assumptions used to accomplish the Work. Presentation shall include:
 - (a) Contract scope.
 - (b) Submittals with City's review.
 - (c) Activity durations.
 - (d) Logic.
 - (e) Activity coding.

- (f) Weather assumptions.
- (g) Resource Loading
- (h) Cost Loading and Resource Loading
- (i) Performance and Progress measurement.
- (j) Consequence of potential risks including:
 - (i) Long lead times (procurement/deliveries).
 - (ii) Labor and materials shortages.
 - (iii) Accidents.
- (k) Environmental factors.
- (l) Contractor's plan to mitigate any potential risks should they occur.
- (m) Establish Key Performance Indicators (KPI's) for actual progress compared to projected progress.
 - (i) Workshops shall be conducted no more than every 14 calendar days, until the Baseline Schedule is accepted and approved by City.

P. Joint Monthly Progress Schedule Review Meetings

1. Joint Project Status and Monthly Progress Schedule Review Meetings will be held between the City and Contractor consistent with the Contractor's submission of a Monthly Progress Schedule. Contractor is responsible for gathering all supporting documentation, presenting the data for the applicable Monthly Progress Schedule and recording the meeting minutes. The primary purpose of these meetings shall be to review the Monthly Progress Schedule, the monthly Pay Application, and construction progress, including but not limited to:
 - a. Actual start and finish dates of work accomplished, or actual start date and physical percent complete. Identify activities started and completed during the previous period and enter the Actual Start and Actual Finish dates. It shall be understood that Actual Start is defined as the date that work begins on an activity with the intent to pursue the work represented by the activity to its substantial completion, and Actual Finish is defined as the date that the activity's work is complete.
 - b. The amount of the Work remaining for the next period as incorporated in the

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schedule. Indicate activity progress and/or revise remaining duration (in workdays) to update each activity started, but not completed (remaining duration.) The remaining duration of an activity shall over-ride the calculated percent complete of an activity's duration when preparing the Monthly Progress Schedule.

- c. Changes in the critical path(s) of the schedule.
 - d. Modifications that affect durations, sequencing or logic of activities for which the City, Governmental Authority(s) or other third parties are responsible.
 - e. The assessment of any delays to Longest Path(s).
 - f. Determination of delays, and, as applicable, adjustment of Force Majeure Reserve.
 - g. All other schedule changes as reflected in the accompanying narrative will be reviewed for relevance and effect on remaining Work.
 - h. Resource constraints, if any and proposed work-around sequences.
 - (i) Review proposed schedule changes, future Work and potential problems or impact.
 - (j) Review the Application for Payment to determine the accuracy of, in accordance with the Project Schedule, all progress achieved, the satisfaction all requirements relating to invoicing for Stored Materials, Time and Material (T&M) Change Orders, and whether it is otherwise complete and accurate.
- Q. Modifications – Time Impact Analysis
- 1. Proposed modifications, including potential delays that are anticipated or experienced shall be submitted to City. Contractor has a duty to mitigate delays through modified sequences to minimize cost and time impact caused by the change or potential delay.
 - 2. The Contractor shall prepare a Delay Analysis for each modification, potential delay, delay event, or Contractor request that may affect the Scheduled Substantial Completion Date. The Delay Analysis shall be developed and submitted in accordance with Contract Documents or as requested by City and shall conform to all scheduling principles described in this Section. Preparation of Time Impact Analyses is considered part of construction process and shall be performed at no additional cost to City.
 - 3. Delay Analysis methodology shall follow the guidelines contained in the Association for the Advancement of Cost Engineering International (AACEI) Time Impact Analysis as Applied in Construction.

4. City will strive to approve or reject each Delay Analysis within ten Work Days after receipt of each Time Impact Analysis, unless subsequent negotiations are required, or multiple analyses are submitted at one time. Upon Approval, a copy of the Time Impact Analysis signed by City shall be returned to Contractor and incorporated into Schedule at next Monthly Progress Schedule update which will then become the current approved Schedule.
5. Delay Analysis shall meet requirements for submittal of Schedules including a Fragnet, with sufficient supporting documentation to enable City to make a determination of Contractor's request for a time extension.
6. Upon execution of a Change Order adjusting the Schedule Substantial Completion Date, the agreed upon event and impact shall be included in the next Monthly Progress Schedule if the parties agree to the extent of the impact. Changes in the schedule should be clearly identifiable by specific Activity IDs and activity coding and Work Breakdown Structure for changes as agreed upon with City. Inclusion of changed conditions shall conform to all scheduling principles noted in this Section. Changes included as an adjustment to the existing schedule activity durations are not allowed.
7. Once the Delay Analysis has been approved, the activities associated with that Time Impact Analysis should be added to the next Monthly Progress Schedule or Look-Ahead Schedule.
8. If the parties are unable to reach an agreement about how to forward-look the effect of the impact on the Monthly Progress Schedule's Critical Path(s), City may allow the Contractor to insert a Fragnet into the schedule on a preliminary basis following agreement of the proposed Fragnet activities. The duration of the Fragnet activities and/or the impact to the Scheduled Substantial Completion Date will be adjusted through the monthly update process as the actual duration of the delay becomes known.

R. Other Schedules

1. The Contractor may use other schedules and report in other formats to manage its work on a day-to-day basis, but these other schedules do not represent or replace the Project Schedules as specified in this Section.

8.01 PRE-CONSTRUCTION SCHEDULE

- A. When Preconstruction Services are to be provided by the Contractor, upon receipt of the NTP for Preconstruction Services, Contractor shall prepare a Preconstruction Schedule which includes those activities prior to approval to proceed with construction activities.
- B. The Preconstruction Schedule shall include the activities described in the plans developed during Preconstruction including design plans, subcontracting plans, procurement plan,

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construction plans and development and negotiation of a Guaranteed Maximum Price (if applicable) at a summary level which can be replaced with detailed information as the Project Schedule is finalized and the construction is authorized.

8.02 PROJECT SCHEDULES

A. Proposed Project Schedule

1. Prepare an initial Proposed Project Schedule (Proposed Schedule) representing the Contractor's plan for the Work in accordance with the requirements of this Section. The Proposed Project Schedule will include the elements of the Preconstruction Schedule and be the initial draft of the Project Schedule. The Proposed Schedule will be the basis for Monthly Progress Schedules and monthly Pay Applications until the approval of the Baseline Schedule.
2. The Proposed Schedule shall be updated on a monthly basis until the approval of the Baseline Schedule after which the Baseline Schedule becomes the Project Schedule.

B. Baseline and Project Schedule

1. The Baseline Schedule is the Project Schedule at the point in time when the Contractor and City agree and approve the Proposed Schedule as the accepted basis for the Project. Requirements described in this subsection shall apply to the all Baseline Schedule submissions.
2. Baseline Schedule submitted by Contractor and approved by the City shall contain no progress for any activities and shall have a Data Date of the Notice to Proceed date.
3. Prepare a draft Baseline Schedule after the Baseline Schedule Workshop has been conducted.
4. Within 14 calendar days after the draft Baseline Schedule is accepted the Contractor shall provide its final Baseline Schedule for City's review and comments.
5. The final Baseline Schedule submission shall include the following:
 - a. The approved final Baseline Schedule shall be version 00.
 - b. One full-color time-scaled network document in PDF format organized by WBS. Print sizes shall be 11 inches by 17 inches standard sized sheets. Provide following information on the document:
 - (i) Activity ID.
 - (ii) Activity Description.

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- (iii) Original Duration.
 - (iv) Remaining Duration.
 - (v) Duration Percent Complete.
 - (vi) Early Start.
 - (vii) Early Finish.
 - (viii) Late Start.
 - (ix) Late Finish
 - (x) Total Float
 - (xi) Activities Gantt Chart
6. The Baseline Schedule narrative which shall address the following:
- a. Description of the Contractor's plan to perform the work through the entire contract performance period.
 - b. Description of primary, secondary and tertiary Critical Paths.
 - c. Explanation of calendars used, including days of the week, holidays, etc.
 - d. Discuss calendar assignment to activities.
 - e. Description of major pieces of equipment that will be used on the site.
 - f. Discuss procurement of long lead items.
 - g. A discussion of monthly cash flow planned costs, and cumulative expenditures.
 - h. A general description of the means and methods proposed for the execution of the Work including, but not limited to:
 - (1) Discussion of operating areas and the proposed sequences.
 - (2) Description of the planned crews - sizes, equipment used, etc.
 - (3) Number of shifts to perform the Work.
 - (4) Significant activities that may inhibit the Work.

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- (5) A listing of all milestones.
 7. Contractor shall represent that the final Baseline Schedule is an accurate representation of Contractor's plan for performing the entire Work and that Contractor intends to use such schedule to execute the Work in compliance with the Contract Documents. Once the final Baseline Schedule is accepted it shall be the initial Project Schedule and used as the baseline in the Monthly Progress Schedules.
- C. Monthly Progress Schedules
1. Monthly Progress Schedules are Project Schedules with progress achieved indicated for each Activity.
 2. Project Schedules shall be progressed (updated) on a monthly basis until Final Acceptance is accomplished. Progress of Schedule activities shall be a physical percent complete as agreed with the City.
 3. The Contractor shall not reduce activity durations in an attempt to reduce negative float. If the Contractor intends to execute activities quicker than the original duration, this shall be mentioned in the float analysis.
 4. Approved Changes shall be included in each Monthly Progress Schedule.
 5. Contractor shall meet with City each month in a Joint Monthly Progress Schedule Meeting,
 6. Contractor shall make two submittals (Progress Only and Contractor's Adjusted) of the Project Schedule each month:
 - a. Shall incorporate the Contractor's Monthly Update (i.e. logic, durations, and calendar) made to the schedule including progress update information. This submission shall follow the scheduling principles described in this Section.
 7. Each version of the Monthly Progress Schedule submitted by the Contractor shall require approval by City.
 8. The Data Date for the Monthly Progress Schedule is 00:00 hours on Saturday following the last Friday of the Month. For each update of the Proposed and Baseline Schedules, the Version number shall increase by 1, and the previous schedule shall be archived to permit an audit trail.
 - a. Designations for the Progress Only (PO) and the Contractor's Adjusted (CA) shall clearly define the submission.
 - b. City will review and approve Monthly Progress Schedules based on remaining

CONSTRUCTION SCHEDULES

durations provided for each activity.

- c. Each Monthly Progress Schedule (PO and CA) shall contain activity progress measured through the Data Date and shall be submitted to the City for its review.
9. The City will review the Monthly Progress Schedule and provide comments at the Joint Monthly Progress Schedule Meeting to be held five working days after submission of the Monthly Progress Schedule.
 10. Monthly Progress Schedule submissions shall be comprised of the following:
 - a. One full-color time-scaled network document in PDF format organized by WBS. Print sizes shall be 11 inches by 17 inches standard sized sheets.

Provide following information on the document:

- (1) Activity ID.
 - (2) Activity Description.
 - (3) Original Duration.
 - (4) Remaining Duration.
 - (5) Duration Percent Complete.
 - (6) Early Start.
 - (7) Early Finish.
 - (8) Late Start.
 - (9) Late Finish.
 - (10) Total Float.
- b. The Monthly Progress Schedule narrative shall address the following:
 - (1) Description of the Work completed by the Contractor in the past performance period and Contractor's plan to perform the work through the entire next performance period, including shift work.
 - (2) Description of primary, secondary, and tertiary Critical Paths.
 - (3) Description of problem areas and anticipated problem areas and an

explanation of corrective actions taken or planned to be taken.

- (4) Current and anticipated delays including cause of delay, corrective actions taken, and impact of delay on other activities, milestones, and completion dates.
- (5) Pending items (Minor Changes in the Work, Change Orders, Time Impact Analyses) and status thereof.
- (6) A list of fully executed Changes issued by the Wednesday of the week before the last Friday of every reporting period.
- (7) A description of any changes made to the schedule and reasons.
- (8) A narrative to show revisions since previous submissions for changes in scope of work, sequencing and other identifiable changes.
- (9) Progress made on critical activities indicated on CPM schedule.
- (10) Status of critical project components (percent complete, amount of time ahead or behind schedule) and if delays have occurred provide an analysis of how they may be mitigated.
- (11) Explanations for any lack of work on critical path activities planned to be performed during last month. Identify any changes to the critical path and the drivers for each change.
- (12) List of critical activities scheduled to be performed next month.
- (13) Status of major material and equipment procurement.
- (14) Any delays encountered during the reporting period.
- (15) Updated schedule duration uncertainty to coincide with the Project status and risk exposures.

D. Look-Ahead Schedules:

1. The Look-Ahead Schedule shall be the actual detailed work plan used by the Contractor in meeting the Contract schedule and milestones. The Look-Ahead Schedule shall be an element of the Contractor's Project Schedule.
2. The Look-Ahead Schedule shall be the basis of the weekly Progress Meetings.
3. The Look-Ahead Schedule shall display:

CONSTRUCTION SCHEDULES

- a. Past Week Activities
 - b. Current Week Activities
 - c. Three Week Look ahead Activities
4. Look-Ahead Schedules shall include as-built data, forecasted activity sequences, activity durations, through the Scheduled Substantial Completion Date and Final Acceptance, demonstrating the entire scope of Work.
 5. In months coinciding with a Look-Ahead Schedule submission, PO Monthly Progress Schedule shall be based on the last approved Monthly Progress Schedule
 6. Submission of Look-Ahead Schedules shall not replace the requirement for Contractor to prepare a Time Impact Analysis indicating delay to Scheduled Substantial Completion Date.
- E. Commissioning and Integration Testing Schedule:
1. Testing and Commissioning is expected to be carried as a summary activity in the Baseline Schedule and Project Schedules until a draft Commissioning and Integration Testing Schedule shall be submitted not later than 90 days prior to the first testing / commissioning before the Scheduled Substantial Completion Date.
 2. A final Commissioning and Integration Testing Schedule shall be submitted no later than 60 days prior to the first testing / commissioning activity before the Scheduled Substantial Completion Date and upon approval shall be incorporated into the Project Schedule with a Monthly Progress Schedule.
 3. The Commissioning and Integration Testing Schedule shall display scheduled Work so that each activity is shown with duration of no more than 15 workdays.
- F. Recovery Schedule
1. Should any of the following conditions exist, City may require the Contractor to prepare, at no extra cost to City, a plan of action and a Recovery Schedule as to how the Contractor plans to reorganize its work and resources to complete the Work by the Scheduled Substantial Completion Date and recover any lost time and/or delays that have been determined by the City to be caused by the Contractor:
 - a. Contractor's monthly progress report indicates delays that are, as determined by City, of sufficient magnitude that the Contractor's ability to complete the Work by the Scheduled Substantial Completion Date is brought into question.
 - (1) If the Work is delayed on the Critical Path item for a period which exceeds

the greater of either a) thirty (-30) days in the aggregate, or b) that number of days in the aggregate equal to five percent of the days remaining until the approved Substantial Completion. For example, If the remaining duration during the period update is 300 Days, then five percent of the remaining 300 Days is 15 Days. The greater of (-30) days or (-15) days is (-15) days.

- (2) Contractor 's performance and resource utilization are not as planned to result in unnecessary consumption of the float.
 - (3) Contractor desires to make changes in the logic (sequencing of Work) or the planned duration of future activities in the schedule to recover lost time.
- b. Contractor shall submit a Recovery Schedule according to the requirements described in this Section. A Recovery Schedule, when required, shall be submitted to City for review and approval within 21 calendar days of Contractor receiving City's written request.
- c. Changes included in Recovery Schedule shall be documented. Contractor shall submit to City an audit report that has been prepared using schedule comparison software (i.e. Claim Digger, Project Investigator, or other software approved by City).
- d. If a recovery schedule is required hereunder, the City, at its sole discretion, may withhold the Contractor's Fee for that period in the Payment Application until such time the Contractor has prepared, and the City has accepted such recovery schedule.
- e. The Recovery Schedule submission shall include the following:
- (1) Detailed narrative describing (with an explanation for the reason of) any revised sequences, durations, and resources.
 - (2) Anticipated effect of revision on the current Project Schedule and Scheduled Substantial Completion Date, including describing change in affected activities' Total Float value.
 - (3) Contractor shall furnish sufficient labor, resources and equipment to ensure the prosecution of the Work meets the current Scheduled Substantial Completion Date. If in the opinion of City, Contractor falls behind in the prosecution of the Work as indicated in the current Schedule, Contractor shall take such steps as may be necessary to improve its progress. City may require Contractor to increase the number of shifts, days of work, and/or the amount of plant and equipment, all without additional cost to City.
 - (4) If Contractor fails or refuses to implement such measures to bring the Work back to conformity within the Scheduled Substantial Completion Date, City

CONSTRUCTION SCHEDULES

shall have the right to declare such failure or refusal a Contractor Event of Default under the Contract.

G. Revised Baseline Schedule

1. Either City or Contractor may request a Revised Baseline Schedule (Re-Baseline Schedule). The Monthly Progress Schedule to reflect actual progress shall not be considered as a Revised Baseline Schedule.
2. A Revised Baseline Schedule is considered necessary under the following conditions:
 - a. Additions, deletions, or revisions to activities required by Contract modification.
 - b. City determines there is reasonable doubt that milestones or the Scheduled Substantial Completion Date will be met. A Schedule Revision shall demonstrate how Contractor intends to reschedule remaining work by the Scheduled Substantial Completion Date. There shall not be additional cost to City, through re-sequencing and reallocating its forces to complete Work by Scheduled Substantial Completion Date.
3. Revised Baseline Schedule, when required, shall be submitted to City for review and approval within 21 days of Contractor receiving City's written request.
4. Revised Baseline Schedule shall conform to all requirements described in this Section for Project Schedules and shall include:
 - a. An audit report that has been prepared using schedule comparison software (i.e. Claim Digger, Project Investigator, or other software approved by the City.)
 - b. Detailed narrative explaining reason for revision.
 - c. Anticipated effect of the Revised Baseline Schedule on the Scheduled Substantial Completion Date, including describing change in affected activities Total Float value.
 - d. Appropriate Fragnet demonstrating the necessary changes.

H. As Built Schedule

1. Contractor shall prepare and submit an As-Built Schedule documenting actual start and actual finish dates for all activities and logic ties for all activities to show actual sequence in which Work was performed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01326
CONSTRUCTION SEQUENCING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Work periods.
- B. Mobilization and demobilization.
- C. Construction sequence.

1.02 WORK PERIODS

- A. No work is permitted at HOU during the following periods:
 - 1. Beginning at 6:00 a.m. CST (0600 hours) on Tuesday prior to Thanksgiving Day and to 10:00 p.m. CST (2000 hours) the following Monday.
 - 2. Beginning at 6:00 a.m. CST (0600 hours) one week prior to Christmas Day and to 11:59 p.m. CST (2359 hours) January 2 following.
 - 3. Beginning at 6:00 a.m. CST (0600 hours) on Friday prior to Houston Area Spring Break, and to 11:59 p.m. CST (2359 hours) the following Monday. These dates may be adjusted by HAS operations depending on scheduling of Spring Break for Houston Area School Districts.

No pavements shall be closed during these periods. The Contractor shall prepare any closed pavements to be opened during these periods, including, but not limited to, removal of all barricades and pavement closure devices, replacement of pavement markings. Coordinate requirements with HAS operations. This work shall be considered subsidiary to the cost of the project and shall not be measured or paid for separately.

- A. Reference the project phasing sheets of the plan set for details and required work hours, by phase. The contractor is required to complete the work by phase within the calendar days noted in the project phasing sheets of the plan set. Each Bid Schedule will be initiated only with a Notice to Proceed by the Owner. The Notices to Proceed may or may not be numerically sequential and may or may not be issued immediately after completion of the preceding Bid Schedule. The Contractor may not perform work without an authorized Notice to Proceed.
- B. For purposes of on-site construction operations for interior work, work may be accomplished in one or more of the following daily schedules (shifts) and as specified elsewhere herein:

CONSTRUCTION SEQUENCING

1. “Day (D) Shift”: For work fully confined behind dust-resistant enclosures and where airborne or structure-borne noise is abatable by temporarily ceasing operations, work from 0000 hours through 2400 hours each day of the week, meaning a 24 hour shift is available whether or not all hours are used; however, deliver products and remove debris only during “N Shift.”
 2. “Night (N) Shift”: For work that cannot, due to dust or noise-producing operations, be done during “D Shift”, work from 1900 hours through 0600 hours each day of the week (8-hour shift, one-hour lunch break), with the following restrictions on access:
 - a. Move products into and remove debris only during “N shift” period.
 - b. Complete work of the shift and entirely evacuate the work area by 0600 of the next day, including rubbish removal, leaving enclosures or barricades in place.
- C. For purposes of on-site construction operations for exterior work within the AOA, work shall conform to the following:
1. The contractor shall not perform lane closures with the Terminal Roadways unless approved in advance and in writing by HAS Airport Operations.
 2. Fire station access must be maintained at all times.
 3. Maintain access through work zone to terminal buildings and garages at all times unless indicated on the plans. Temporary closures of any access must only be completed between the hours of 10:00 p.m. CST (2200 hours) to 6:00 a.m. CST (0600 hours) on weekend days unless indicated on the plans. Temporary closures of delivery entrances and exits may only occur from 8:00 p.m. CST (2000 hours) to 4:00 a.m. CST (0400 hours) on weekend days unless indicated on the plans.
 4. The contractor shall coordinate staging areas for equipment with HAS Airport operations.
 5. See additional traffic control sequencing notes in the plans.
- 1.03 MOBILIZATION AND DEMOBILIZATION
- A. Payment for mobilization is specified in Section 01290 - Payment Procedures.
 - B. General mobilization applicable to the Work, regardless of construction sequencing specified herein includes:
 1. Construction and Submittal Schedule processing following Sections 01325 - Construction Schedules and 01340 - Shop Drawings, Product Data and Samples.
 2. Obtain and pay for permits.

3. Submittal of other documents following Section 01312 - Coordination and Meetings.
4. Survey Base Building Following Section 01726- Base Facility Survey and process related Document 00685- Request for Information, including accessibility by cutting, following Section 01731- Cutting and Patching, into concealed areas.
5. Security badging following Section 01506 - Temporary Controls.
6. Approval of construction schedules following Section 01325 - Construction Schedules.
7. Product acquisition for other tasks; except products with short lead times may be acquired later as required to maintain schedule performance.
8. Acquisition of major construction equipment and set-up of on-site storage and office space.
9. Other activities necessary to maintain schedule performance.
10. Construction of exterior and interior barricades and enclosures following Section 01505 - Temporary Facilities.

C. Demobilization:

1. Processing of closeout documents, following Section 01770 - Contract Closeout, and

1.04 CONSTRUCTION SEQUENCE

- A. Sequence of work or tasks indicated in the schedule included in the Drawings is intended only as a guide for Bidding.
- B. Prepare and process Contractor's construction schedule following Section 01325- Construction Schedules.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CONSTRUCTION SEQUENCE

- A. Construct the Work in sequence as shown on Drawings.

END OF SECTION

CONSTRUCTION SEQUENCING

01326-3 ver. 03.02.18

SECTION 01330
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittal procedures for:

1. Construction Schedules and Cash Flow Curve (billing forecast).
2. Shop Drawings, Product Data and Samples
3. Manufacturer's Certificates
4. Construction Photographs
5. Project Record Documents and monthly certification.
6. Design Mixes

1.02 SUBMITTAL PROCEDURES

A. Scheduling and Handling:

1. The Contractor must utilize Microsoft SharePoint, and/or a web-based system run by the Houston Airport System, to submit RFIs, Submittals and Invoices. Before doing so, the Contractor must attend a brief mandatory SharePoint training session, which will be conducted by a member of HAS. The Contractor must contact the designated HAS trainer prior to the start of construction to schedule a time for training. Access to SharePoint will not be given to the Contractor's team until training is completed. All document collaboration will be done using SharePoint.
2. Submit Shop Drawings, Data and Samples for related components as required by Specifications and Project Manager.
3. Schedule submittals well in advance of need for construction Products. Allow time for delivery of Products after submittal approval.
4. Develop submittal schedule that allows sufficient time for initial review, correction, resubmission and final review of all submittals. Allow a minimum of 30 days for initial review. Project Manager will review and return submittals to

SUBMITTAL PROCEDURES

Contractor as expeditiously as possible, but time required for review will vary depending on complexity and quantity of data submitted.

5. Project Manager's review of submittals covers only general conformity to Drawings, Specifications and dimensions that affect layout. Contractor is responsible for quantity determination. No quantities will be verified by Project Manager. Contractor is responsible for errors, omissions or deviations from Contract requirements; review of submittals does not relieve Contractor from the obligation to furnish required items in accordance with Drawings and Specifications.
6. Submit five copies of documents unless otherwise specified.
7. Revise and resubmit submittals as required. Identify all changes made since previous submittal.
8. Assume risk for fabricated Products delivered prior to approval. Do not incorporate Products into the Work, or include payment for Products in periodic progress payments, until approved by Project Manager.

B. Transmittal Form and Numbering:

1. Transmit each submittal to Project Manager with Transmittal letter which includes:
 - a. Date and submittal number
 - b. Project title and number
 - c. Names of Contractor, Subcontractor, Supplier and manufacturer
 - d. Identification of Product being supplied
 - e. Location of where Product is to be installed
 - f. Applicable Specification section number
2. Identify deviations from Contract documents clouding submittal drawings. Itemize and detail on separate 8-1/2 by 11-inch sheets entitled "DEVIATIONS FOR _____." When no deviations exist, submit a sheet stating no deviations exist.
3. Have design deviations signed and sealed by an appropriate design professional, registered in the State of Texas.
4. Sequentially number transmittal letters beginning with number one.
5. Use original number for resubmittals with an alphabetic suffix (i.e., 2A for the first resubmittal of submittal 2, or 15C for third resubmittal of submittal 15, etc.).

SUBMITTAL PROCEDURES

Show only one type of work or Product on each submittal. Mixed submittals will not be accepted.

C. Contractor's Stamp:

1. Apply Contractor's Stamp certifying that the items have been reviewed in detail by Contractor and that they comply with Contract requirements, except as noted by requested variances.
2. As a minimum, Contractor's Stamp shall include:
 - a. Contractor's name.
 - b. Job number.
 - c. Submittal number.
 - d. Certification statement Contractor has reviewed submittal and it is in compliance with the Contract.
 - e. Signature line for Contractor

D. Submittals will be returned with one of the following Responses:

1. "REVIEWED AS SUBMITTED" when no response and resubmittal is required.
2. "NO EXCEPTION" when sufficient information has supplied to determine that item described is accepted and that no resubmittal is required.
3. "MAKE CORRECTIONS AS NOTED WHEN EXCEPTIONS DO NOT REQUIRE FUTURE CHANGES" when sufficient information has been supplied to determine that item will be acceptable subject to changes, or exceptions, which will be clearly stated. When exceptions require additional changes, the changes must be submitted for approval. Resubmittal is not required when exceptions require no further changes.
4. "REVISE AND RESUBMIT" when submittal do not contain sufficient information, or when information provided does not meet Contract requirements. Additional data or details requested by Project Manager must be submitted to obtain approval.

1.03 MANUFACTURER'S CERTIFICATES

- A. When required by Specification sections, submit manufacturers' certificate of compliance for review by Project Manager.

SUBMITTAL PROCEDURES

- B. Place Contractor's Stamp on front of certification.
- C. Submit supporting reference data, affidavits, and certifications as appropriate.
- D. Product certificates may be recent or from previous test results, but must be acceptable to Project Manager.

1.04 DESIGN MIXES

- A. When required by Specification sections, submit design mixes for review.
- B. Place Contractor's Stamp, as specified in this section, on the front of each design mix.
- C. Mark each mix to identify proportions, gradations, and additives for each class and type of mix submitted. Include applicable test results from samples for each mix. Perform tests and certifications within 12 months of the date of the submittal.
- D. Maintain copies of approved mixes at mixing plant.

1.05 CHANGES TO CONTRACT

- A. Changes to Contract may be initiated by completing a Request for Information form. Project Manager will provide a response to Contractor by completing the form and returning it to Contractor.
 - 1. If Contractor agrees that the response will result in no increase in cost or time, a Minor Change in the Work will be issued by City Engineer.
 - 2. If Contractor and Project Manager agree that an increase in time or cost is warranted, Project Manager will forward the Request for Proposal for negotiation of a Change Order.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

ATTACHMENT 1

TCEQ Office Use Only
 Permit No:
 CN:
 RN:



Notice of Intent (NOI) for an Authorization for Stormwater Discharges Associated with Construction Activity under TPDES General Permit TXR150000

IMPORTANT INFORMATION

Please read and use the General Information and Instructions prior to filling out each question in the NOI form.

Use the NOI Checklist to ensure all required information is completed correctly.
Incomplete applications delay approval or result in automatic denial.

Once processed your permit authorization can be viewed by entering the following link into your internet browser: http://www2.tceq.texas.gov/wq_dpa/index.cfm or you can contact TCEQ Stormwater Processing Center at 512-239-3700.

ePERMITS

Effective September 1, 2018, this paper form must be submitted to TCEQ with a completed electronic reporting waiver form (TCEQ-20754).

To submit an NOI electronically, enter the following web address into your internet browser and follow the instructions: <https://www3.tceq.texas.gov/steers/index.cfm>

APPLICATION FEE AND PAYMENT

The application fee for submitting a paper NOI is \$325. The application fee for electronic submittal of a NOI through the TCEQ ePermits system (STEERS) is \$225.

Payment of the application fee can be submitted by mail or through the TCEQ ePay system. The payment and the NOI must be mailed to separate addresses. To access the TCEQ ePay system enter the following web address into your internet browser: <http://www.tceq.texas.gov/epay>.

Provide your payment information for verification of payment:

- If payment was mailed to TCEQ, provide the following:
 - Check/Money Order Number: [REDACTED]
 - Name printed on Check: [REDACTED]
- If payment was made via ePay, provide the following:
 - Voucher Number: [REDACTED]
 - A copy of the payment voucher is attached to this paper NOI form.

RENEWAL (This portion of the NOI is not applicable after June 3, 2018)

Is this NOI for a renewal of an existing authorization? Yes No

If Yes, provide the authorization number here: TXR15 [REDACTED]

NOTE: If an authorization number is not provided, a new number will be assigned.

SECTION 1. OPERATOR (APPLICANT)

a) If the applicant is currently a customer with TCEQ, what is the Customer Number (CN) issued to this entity? CN [REDACTED]

(Refer to Section 1.a) of the Instructions)

b) What is the Legal Name of the entity (applicant) applying for this permit? (The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal document forming the entity.)

[REDACTED]

c) What is the contact information for the Operator (Responsible Authority)?

Prefix (Mr. Ms. Miss): [REDACTED]

First and Last Name: [REDACTED] Suffix: [REDACTED]

Title: [REDACTED] Credentials: [REDACTED]

Phone Number: [REDACTED] Fax Number: [REDACTED]

E-mail: [REDACTED]

Mailing Address: [REDACTED]

City, State, and Zip Code: [REDACTED]

Mailing Information if outside USA:

Territory: [REDACTED]

Country Code: [REDACTED] Postal Code: [REDACTED]

d) Indicate the type of customer:

- Individual
- Limited Partnership
- General Partnership
- Trust
- Sole Proprietorship (D.B.A.)
- Corporation
- Estate
- Federal Government
- County Government
- State Government
- City Government
- Other Government
- Other: [REDACTED]

e) Is the applicant an independent operator? Yes No

(If a governmental entity, a subsidiary, or part of a larger corporation, check No.)

f) Number of Employees. Select the range applicable to your company.

0-20

251-500

21-100

501 or higher

101-250

g) Customer Business Tax and Filing Numbers: (**Required** for Corporations and Limited Partnerships. **Not Required** for Individuals, Government, or Sole Proprietors.)

State Franchise Tax ID Number:

Federal Tax ID:

Texas Secretary of State Charter (filing) Number:

DUNS Number (if known):

SECTION 2. APPLICATION CONTACT

Is the application contact the same as the applicant identified above?

Yes, go to Section 3

No, complete this section

Prefix (Mr. Ms. Miss):

First and Last Name: Suffix:

Title: Credential:

Organization Name:

Phone Number: Fax Number:

E-mail:

Mailing Address:

Internal Routing (Mail Code, Etc.):

City, State, and Zip Code:

Mailing information if outside USA:

Territory:

Country Code: Postal Code:

SECTION 3. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE

a) If this is an existing permitted site, what is the Regulated Entity Number (RN) issued to this site? RN

(Refer to Section 3.a) of the Instructions)

- b) Name of project or site (the name known by the community where it's located): [REDACTED]
- c) In your own words, briefly describe the type of construction occurring at the regulated site (residential, industrial, commercial, or other): [REDACTED]
- d) County or Counties (if located in more than one): [REDACTED]
- e) Latitude: [REDACTED] Longitude: [REDACTED]
- f) Site Address/Location

If the site has a physical address such as 12100 Park 35 Circle, Austin, TX 78753, complete *Section A*.

If the site does not have a physical address, provide a location description in *Section B*.
Example: located on the north side of FM 123, 2 miles west of the intersection of FM 123 and Highway 1.

Section A:

Street Number and Name: [REDACTED]

City, State, and Zip Code: [REDACTED]

Section B:

Location Description: [REDACTED]

City (or city nearest to) where the site is located: [REDACTED]

Zip Code where the site is located: [REDACTED]

SECTION 4. GENERAL CHARACTERISTICS

- a) Is the project or site located on Indian Country Lands?
 - Yes, do not submit this form. You must obtain authorization through EPA Region 6.
 - No
- b) Is your construction activity associated with a facility that, when completed, would be associated with the exploration, development, or production of oil or gas or geothermal resources?
 - Yes. Note: The construction stormwater runoff may be under jurisdiction of the Railroad Commission of Texas and may need to obtain authorization through EPA Region 6.
 - No
- c) What is the Primary Standard Industrial Classification (SIC) Code that best describes the construction activity being conducted at the site? [REDACTED]
- d) What is the Secondary SIC Code(s), if applicable? [REDACTED]
- e) What is the total number of acres to be disturbed? [REDACTED]
- f) Is the project part of a larger common plan of development or sale?

Yes

No. The total number of acres disturbed, provided in e) above, must be 5 or more. If the total number of acres disturbed is less than 5, do not submit this form. See the requirements in the general permit for small construction sites.

g) What is the estimated start date of the project? [REDACTED]

h) What is the estimated end date of the project? [REDACTED]

i) Will concrete truck washout be performed at the site? Yes No

j) What is the name of the first water body(ies) to receive the stormwater runoff or potential runoff from the site? [REDACTED]

k) What is the segment number(s) of the classified water body(ies) that the discharge will eventually reach? [REDACTED]

l) Is the discharge into a Municipal Separate Storm Sewer System (MS4)?

Yes No

If Yes, provide the name of the MS4 operator: [REDACTED]

Note: The general permit requires you to send a copy of this NOI form to the MS4 operator.

m) Is the discharge or potential discharge from the site within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer, as defined in 30 TAC Chapter 213?

Yes, complete the certification below.

No, go to Section 5

I certify that the copy of the TCEQ-approved Plan required by the Edwards Aquifer Rule (30 TAC Chapter 213) that is included or referenced in the Stormwater Pollution Prevention Plan will be implemented. Yes

SECTION 5. NOI CERTIFICATION

a) I certify that I have obtained a copy and understand the terms and conditions of the Construction General Permit (TXR150000). Yes

b) I certify that the full legal name of the entity applying for this permit has been provided and is legally authorized to do business in Texas. Yes

c) I understand that a Notice of Termination (NOT) must be submitted when this authorization is no longer needed. Yes

d) I certify that a Stormwater Pollution Prevention Plan has been developed, will be implemented prior to construction and to the best of my knowledge and belief is compliant with any applicable local sediment and erosion control plans, as required in the Construction General Permit (TXR150000). Yes

Note: For multiple operators who prepare a shared SWP3, the confirmation of an operator may be limited to its obligations under the SWP3, provided all obligations are confirmed by at least one operator.

SECTION 6. APPLICANT CERTIFICATION SIGNATURE

Operator Signatory Name: [REDACTED]

Operator Signatory Title: [REDACTED]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code §305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signature (use blue ink): _____ Date: _____

NOTICE OF INTENT CHECKLIST (TXR150000)

Did you complete everything? Use this checklist to be sure!

Are you ready to mail your form to TCEQ? Go to the General Information Section of the Instructions for mailing addresses.

Confirm each item (or applicable item) in this form is complete. This checklist is for use by the applicant to ensure a complete application is being submitted. **Missing information may result in denial of coverage under the general permit.** (See NOI process description in the General Information and Instructions.)

APPLICATION FEE

If paying by check:

- Check was mailed **separately** to the TCEQs Cashier's Office. (See Instructions for Cashier's address and Application address.)
- Check number and name on check is provided in this application.

If using ePay:

- The voucher number is provided in this application and a copy of the voucher is attached.

RENEWAL

- If this application is for renewal of an existing authorization, the authorization number is provided.

OPERATOR INFORMATION

- Customer Number (CN) issued by TCEQ Central Registry
- Legal name as filed to do business in Texas. (Call TX SOS 512-463-5555 to verify.)
- Name and title of responsible authority signing the application.
- Phone number and e-mail address
- Mailing address is complete & verifiable with USPS. www.usps.com
- Type of operator (entity type). Is applicant an independent operator?
- Number of employees.
- For corporations or limited partnerships - Tax ID and SOS filing numbers.
- Application contact and address is complete & verifiable with USPS. <http://www.usps.com>

REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE

- Regulated Entity Number (RN) (if site is already regulated by TCEQ)
- Site/project name and construction activity description
- County
- Latitude and longitude <http://www.tceq.texas.gov/gis/sqmaview.html>

- Site Address/Location. Do not use a rural route or post office box.

GENERAL CHARACTERISTICS

- Indian Country Lands -the facility is not on Indian Country Lands.
- Construction activity related to facility associated to oil, gas, or geothermal resources
- Primary SIC Code that best describes the construction activity being conducted at the site.
www.osha.gov/oshstats/sicser.html
- Estimated starting and ending dates of the project.
- Confirmation of concrete truck washout.
- Acres disturbed is provided and qualifies for coverage through a NOI.
- Common plan of development or sale.
- Receiving water body or water bodies.
- Segment number or numbers.
- MS4 operator.
- Edwards Aquifer rule.

CERTIFICATION

- Certification statements have been checked indicating Yes.
- Signature meets 30 Texas Administrative Code (TAC) §305.44 and is original.

Instructions for Notice of Intent (NOI) for Stormwater Discharges Associated with Construction Activity under TPDES General Permit (TXR150000)

GENERAL INFORMATION

Where to Send the Notice of Intent (NOI):

By Regular Mail:

TCEQ

Stormwater Processing Center (MC228)

P.O. Box 13087

Austin, Texas 78711-3087

By Overnight or Express Mail:

TCEQ

Stormwater Processing Center (MC228)

12100 Park 35 Circle

Austin, TX

Application Fee:

The application fee of \$325 is required to be paid at the time the NOI is submitted. Failure to submit payment at the time the application is filed will cause delays in acknowledgment or denial of coverage under the general permit. Payment of the fee may be made by check or money order, payable to TCEQ, or through EPAY (electronic payment through the web).

Mailed Payments:

Use the attached General Permit Payment Submittal Form. The application fee is submitted to a different address than the NOI. Read the General Permit Payment Submittal Form for further instructions, including the address to send the payment.

ePAY Electronic Payment: <http://www.tceq.texas.gov/epay>

When making the payment you must select Water Quality, and then select the fee category "General Permit Construction Storm Water Discharge NOI Application". You must include a copy of the payment voucher with your NOI. Your NOI will not be considered complete without the payment voucher.

TCEQ Contact List:

Application – status and form questions:

512-239-3700, swpermit@tceq.texas.gov

Technical questions:

512-239-4671, swgp@tceq.texas.gov

Environmental Law Division:

512-239-0600

Records Management - obtain copies of forms:

512-239-0900

Reports from databases (as available):

512-239-DATA (3282)

Cashier's office:

512-239-0357 or 512-239-0187

Notice of Intent Process:

When your NOI is received by the program, the form will be processed as follows:

- **Administrative Review:** Each item on the form will be reviewed for a complete response. In addition, the operator's legal name must be verified with Texas Secretary of State as valid and active (if applicable). The address(es) on the form must be verified with the US Postal service as receiving regular mail delivery. Do not give an overnight/express mailing address.

- **Notice of Deficiency:** If an item is incomplete or not verifiable as indicated above, a notice of deficiency (NOD) will be mailed to the operator. The operator will have 30 days to respond to the NOD. The response will be reviewed for completeness.
- **Acknowledgment of Coverage:** An Acknowledgment Certificate will be mailed to the operator. This certificate acknowledges coverage under the general permit.

or

Denial of Coverage: If the operator fails to respond to the NOD or the response is inadequate, coverage under the general permit may be denied. If coverage is denied, the operator will be notified.

General Permit (Your Permit)

For NOIs submitted **electronically** through ePermits, provisional coverage under the general permit begins immediately following confirmation of receipt of the NOI form by the TCEQ.

For **paper** NOIs, provisional coverage under the general permit begins **7 days after a completed NOI is postmarked for delivery** to the TCEQ.

You should have a copy of your general permit when submitting your application. You may view and print your permit for which you are seeking coverage, on the TCEQ web site <http://www.tceq.texas.gov>. Search using keyword TXR150000.

Change in Operator

An authorization under the general permit is not transferable. If the operator of the regulated project or site changes, the present permittee must submit a Notice of Termination and the new operator must submit a Notice of Intent. The NOT and NOI must be submitted no later than 10 days prior to the change in Operator status.

TCEQ Central Registry Core Data Form

The Core Data Form has been incorporated into this form. Do not send a Core Data Form to TCEQ. After final acknowledgment of coverage under the general permit, the program will assign a Customer Number and Regulated Entity Number, if one has not already been assigned to this customer or site.

For existing customers and sites, you can find the Customer Number and Regulated Entity Number by entering the following web address into your internet browser: <http://www15.tceq.texas.gov/crpub/> or you can contact the TCEQ Stormwater Processing Center at 512-239-3700 for assistance. On the website, you can search by your permit number, the Regulated Entity (RN) number, or the Customer Number (CN). If you do not know these numbers, you can select "Advanced Search" to search by permittee name, site address, etc.

The Customer (Permittee) is responsible for providing consistent information to the TCEQ, and for updating all CN and RN data for all authorizations as changes occur. For this permit, a Notice of Change form must be submitted to the program area.

INSTRUCTIONS FOR FILLING OUT THE NOI FORM

Renewal of General Permit. Dischargers holding active authorizations under the expired General Permit are required to submit a NOI to continue coverage. The existing permit number is required. If the permit number is not provided or has been terminated, expired, or denied, a new permit number will be issued.

Section 1. OPERATOR (APPLICANT)

a) Customer Number (CN)

TCEQ's Central Registry will assign each customer a number that begins with CN, followed by nine digits. **This is not a permit number, registration number, or license number.**

If the applicant is an existing TCEQ customer, the Customer Number is available at the following website: <http://www15.tceq.texas.gov/crpub/>. If the applicant is not an existing TCEQ customer, leave the space for CN blank.

b) Legal Name of Applicant

Provide the current legal name of the applicant. The name must be provided exactly as filed with the Texas Secretary of State (SOS), or on other legal documents forming the entity, as filed in the county. You may contact the SOS at 512-463-5555, for more information related to filing in Texas. If filed in the county, provide a copy of the legal documents showing the legal name.

c) Contact Information for the Applicant (Responsible Authority)

Provide information for the person signing the application in the Certification section. This person is also referred to as the Responsible Authority.

Provide a complete mailing address for receiving mail from the TCEQ. The mailing address must be recognized by the US Postal Service. You may verify the address on the following website: <https://tools.usps.com/go/ZipLookupAction!input.action>.

The phone number should provide contact to the applicant.

The fax number and e-mail address are optional and should correspond to the applicant.

d) Type of Customer (Entity Type)

Check only one box that identifies the type of entity. Use the descriptions below to identify the appropriate entity type. Note that the selected entity type also indicates the name that must be provided as an applicant for an authorization.

Individual

An individual is a customer who has not established a business, but conducts an activity that needs to be regulated by the TCEQ.

Partnership

A customer that is established as a partnership as defined by the Texas Secretary of State Office (TX SOS). If the customer is a 'General Partnership' or 'Joint Venture' filed in the county (not filed with TX SOS), the legal name of each partner forming the 'General Partnership' or 'Joint Venture' must be provided. Each 'legal entity' must apply as a co-applicant.

Trust or Estate

A trust and an estate are fiduciary relationships governing the trustee/executor with respect to the trust/estate property.

Sole Proprietorship (DBA)

A sole proprietorship is a customer that is owned by only one person and has not been incorporated. This business may:

1. be under the person's name
2. have its own name (doing business as or DBA)
3. have any number of employees.

If the customer is a Sole Proprietorship or DBA, the 'legal name' of the individual business 'owner' must be provided. The DBA name is not recognized as the 'legal name' of the entity. The DBA name may be used for the site name (regulated entity).

Corporation

A customer that meets all of these conditions:

1. is a legally incorporated entity under the laws of any state or country
2. is recognized as a corporation by the Texas Secretary of State
3. has proper operating authority to operate in Texas

The corporation's 'legal name' as filed with the Texas Secretary of State must be provided as applicant. An 'assumed' name of a corporation is not recognized as the 'legal name' of the entity.

Government

Federal, state, county, or city government (as appropriate)

The customer is either an agency of one of these levels of government or the governmental body itself. The government agency's 'legal name' must be provided as the applicant. A department name or other description of the organization is not recognized as the 'legal name'.

Other

This may include a utility district, water district, tribal government, college district, council of governments, or river authority. Provide the specific type of government.

e) Independent Entity

Check No if this customer is a subsidiary, part of a larger company, or is a governmental entity. Otherwise, check Yes.

f) Number of Employees

Check one box to show the number of employees for this customer's entire company, at all locations. This is not necessarily the number of employees at the site named in the application.

g) Customer Business Tax and Filing Numbers

These are required for Corporations and Limited Partnerships. These are not required for Individuals, Government, and Sole Proprietors.

State Franchise Tax ID Number

Corporations and limited liability companies that operate in Texas are issued a franchise tax identification number. If this customer is a corporation or limited liability company, enter the Tax ID number.

Federal Tax ID

All businesses, except for some small sole proprietors, individuals, or general partnerships should have a federal taxpayer identification number (TIN). Enter this number here. Use no prefixes, dashes, or hyphens. Sole proprietors, individuals, or general partnerships do not need to provide a federal tax ID.

TX SOS Charter (filing) Number

Corporations and Limited Partnerships required to register with the Texas Secretary of State are issued a charter or filing number. You may obtain further information by calling SOS at 512-463-5555.

DUNS Number

Most businesses have a DUNS (Data Universal Numbering System) number issued by Dun and Bradstreet Corp. If this customer has one, enter it here.

Section 2. APPLICATION CONTACT

Provide the name and contact information for the person that TCEQ can contact for additional information regarding this application.

Section 3. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE

a) Regulated Entity Number (RN)

The RN is issued by TCEQ's Central Registry to sites where an activity is regulated by TCEQ. This is not a permit number, registration number, or license number. Search TCEQ's Central Registry to see if the site has an assigned RN at <http://www15.tceq.texas.gov/crpub/>. If this regulated entity has not been assigned an RN, leave this space blank.

If the site of your business is part of a larger business site, an RN may already be assigned for the larger site. Use the RN assigned for the larger site.

If the site is found, provide the assigned RN and provide the information for the site to be authorized through this application. The site information for this authorization may vary from the larger site information.

An example is a chemical plant where a unit is owned or operated by a separate corporation that is accessible by the same physical address of your unit or facility. Other examples include industrial parks identified by one common address but different corporations have control of defined areas within the site. In both cases, an RN would be assigned for the physical address location and the permitted sites would be identified separately under the same RN.

b) Name of the Project or Site

Provide the name of the site or project as known by the public in the area where the site is located. The name you provide on this application will be used in the TCEQ Central Registry as the Regulated Entity name.

c) Description of Activity Regulated

In your own words, briefly describe the primary business that you are doing that requires this authorization. Do not repeat the SIC Code description.

d) County

Provide the name of the county where the site or project is located. If the site or project is located in more than one county, provide the county names as secondary.

e) Latitude and Longitude

Enter the latitude and longitude of the site in degrees, minutes, and seconds or decimal form. For help obtaining the latitude and longitude, go to:

<http://www.tceq.texas.gov/gis/sqmaview.html>.

f) Site Address/Location

If a site has an address that includes a street number and street name, enter the complete address for the site in *Section A*. If the physical address is not recognized as a USPS delivery address, you may need to validate the address with your local police (911 service) or through an online map site used to locate a site. Please confirm this to be a complete and valid address. Do not use a rural route or post office box for a site location.

If a site does not have an address that includes a street number and street name, provide a complete written location description in *Section B*. For example: "The site is located on the north side of FM 123, 2 miles west of the intersection of FM 123 and Highway 1."

Provide the city (or nearest city) and zip code of the site location.

Section 4. GENERAL CHARACTERISTICS

a) Indian Country Lands

If your site is located on Indian Country Lands, the TCEQ does not have authority to process your application. You must obtain authorization through EPA Region 6, Dallas. Do not submit this form to TCEQ.

b) Construction activity associated with facility associated with exploration, development, or production of oil, gas, or geothermal resources

If your activity is associated with oil and gas exploration, development, or production, you may be under jurisdiction of the Railroad Commission of Texas (RRC) and may need to obtain authorization from EPA Region 6.

Construction activities associated with a facility related to oil, gas or geothermal resources may include the construction of a well site; treatment or storage facility; underground hydrocarbon or natural gas storage facility; reclamation plant; gas processing facility; compressor station; terminal facility where crude oil is stored prior to refining and at which refined products are stored solely for use at the facility; a

carbon dioxide geologic storage facility; and a gathering, transmission, or distribution pipeline that will transport crude oil or natural gas, including natural gas liquids, prior to refining of such oil or the use of the natural gas in any manufacturing process or as a residential or industrial fuel.

Where required by federal law, discharges of stormwater associated with construction activities under the RRC's jurisdiction must be authorized by the EPA and the RRC, as applicable. Activities under RRC jurisdiction include construction of a facility that, when completed, would be associated with the exploration, development, or production of oil or gas or geothermal resources, such as a well site; treatment or storage facility; underground hydrocarbon or natural gas storage facility; reclamation plant; gas processing facility; compressor station; terminal facility where crude oil is stored prior to refining and at which refined products are stored solely for use at the facility; a carbon dioxide geologic storage facility under the jurisdiction of the RRC; and a gathering, transmission, or distribution pipeline that will transport crude oil or natural gas, including natural gas liquids, prior to refining of such oil or the use of the natural gas in any manufacturing process or as a residential or industrial fuel. The RRC also has jurisdiction over stormwater from land disturbance associated with a site survey that is conducted prior to construction of a facility that would be regulated by the RRC. Under 33 U.S.C. §1342(l)(2) and §1362(24), EPA cannot require a permit for discharges of stormwater from field activities or operations associated with {oil and gas} exploration, production, processing, or treatment operations, or transmission facilities, including activities necessary to prepare a site for drilling and for the movement and placement of drilling equipment, whether or not such field activities or operations may be considered to be construction activities unless the discharge is contaminated by contact with any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of the facility. Under §3.8 of this title (relating to Water Protection), the RRC prohibits operators from causing or allowing pollution of surface or subsurface water. Operators are encouraged to implement and maintain best management practices (BMPs) to minimize discharges of pollutants, including sediment, in stormwater during construction activities to help ensure protection of surface water quality during storm events.

For more information about the jurisdictions of the RRC and the TCEQ, read the Memorandum of Understanding (MOU) between the RRC and TCEQ at 16 Texas Administrative Code, Part 1, Chapter 3, Rule 3.30, by entering the following link into an internet browser:

[http://texreg.sos.state.tx.us/public/readtac\\$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=30](http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=30) or contact the TCEQ Stormwater Team at 512-239-4671 for additional information.

c) Primary Standard Industrial Classification (SIC) Code

Provide the SIC Code that best describes the construction activity being conducted at this site.

Common SIC Codes related to construction activities include:

- 1521 - Construction of Single Family Homes
- 1522 - Construction of Residential Buildings Other than Single Family Homes
- 1541 - Construction of Industrial Buildings and Warehouses

- 1542 - Construction of Non-residential Buildings, other than Industrial Buildings and Warehouses
- 1611 - Highway and Street Construction, except Highway Construction
- 1622 - Bridge, Tunnel, and Elevated Highway Construction
- 1623 - Water, Sewer, Pipeline and Communications, and Power Line Construction

For help with SIC Codes, enter the following link into your internet browser: <http://www.osha.gov/pls/imis/sicsearch.html> or you can contact the TCEQ Small Business and Local Government Assistance Section at 800-447-2827 for assistance.

d) Secondary SIC Code

Secondary SIC Code(s) may be provided. Leave this blank if not applicable. For help with SIC Codes, enter the following link into your internet browser: <http://www.osha.gov/pls/imis/sicsearch.html> or you can contact the TCEQ Small Business and Environmental Assistance Section at 800-447-2827 for assistance.

e) Total Number of Acres Disturbed

Provide the approximate number of acres that the construction site will disturb. Construction activities that disturb less than one acre, unless they are part of a larger common plan that disturbs more than one acre, do not require permit coverage. Construction activities that disturb between one and five acres, unless they are part of a common plan that disturbs more than five acres, do not require submission of an NOI. Therefore, the estimated area of land disturbed should not be less than five, unless the project is part of a larger common plan that disturbs five or more acres. Disturbed means any clearing, grading, excavating, or other similar activities.

If you have any questions about this item, please contact the stormwater technical staff by phone at 512-239-4671 or by email at swgp@tceq.texas.gov.

f) Common Plan of Development

Construction activities that disturb less than five acres do not require submission of an NOI unless they are part of a common plan of development or for sale where the area disturbed is five or more acres. Therefore, the estimated area of land disturbed should not be less than five, unless the project is part of a larger common plan that disturbs five or more acres. Disturbed means any clearing, grading, excavating, or other similar activities.

For more information on what a common plan of development is, refer to the definition of “Common Plan of Development” in the Definitions section of the general permit or enter the following link into your internet browser:

www.tceq.texas.gov/permitting/stormwater/common_plan_of_development_steps.html

For further information, go to the TCEQ stormwater construction webpage enter the following link into your internet browser: www.tceq.texas.gov/goto/construction and search for “Additional Guidance and Quick Links”. If you have any further questions about the Common Plan of Development you can contact the TCEQ Stormwater Team at 512-239-4671 or the TCEQ Small Business and Environmental Assistance at 800-447-2827.

g) Estimated Start Date of the Project

This is the date that any construction activity or construction support activity is initiated at the site. If renewing the permit provide the original start date of when construction activity for this project began.

h) Estimated End Date of the Project

This is the date that any construction activity or construction support activity will end and final stabilization will be achieved at the site.

i) Will concrete truck washout be performed at the site?

Indicate if you expect that operators of concrete trucks will washout concrete trucks at the construction site.

j) Identify the water body(s) receiving stormwater runoff

The stormwater may be discharged directly to a receiving stream or through a MS4 from your site. It eventually reaches a receiving water body such as a local stream or lake, possibly via a drainage ditch. You must provide the name of the water body that receives the discharge from the site (a local stream or lake).

If your site has more than one outfall you need to include the name of the first water body for each outfall, if they are different.

k) Identify the segment number(s) of the classified water body(s)

Identify the classified segment number(s) receiving a discharge directly or indirectly. Enter the following link into your internet browser to find the segment number of the classified water body where stormwater will flow from the site:

www.tceq.texas.gov/waterquality/monitoring/viewer.html or by contacting the TCEQ Water Quality Division at (512) 239-4671 for assistance.

You may also find the segment number in TCEQ publication GI-316 by entering the following link into your internet browser: www.tceq.texas.gov/publications/gi/gi-316 or by contacting the TCEQ Water Quality Division at (512) 239-4671 for assistance.

If the discharge is into an unclassified receiving water and then crosses state lines prior to entering a classified segment, select the appropriate watershed:

- 0100 (Canadian River Basin)
- 0200 (Red River Basin)
- 0300 (Sulfur River Basin)
- 0400 (Cypress Creek Basin)
- 0500 (Sabine River Basin)

Call the Water Quality Assessments section at 512-239-4671 for further assistance.

l) Discharge into MS4 – Identify the MS4 Operator

The discharge may initially be into a municipal separate storm sewer system (MS4). If the stormwater discharge is into an MS4, provide the name of the entity that operates the MS4 where the stormwater discharges. An MS4 operator is often a city, town, county, or utility district, but possibly can be another form of government. Please note that the Construction General Permit requires the Operator to supply the MS4 with a

copy of the NOI submitted to TCEQ. For assistance, you may call the technical staff at 512-239-4671.

m) Discharges to the Edwards Aquifer Recharge Zone and Certification

The general permit requires the approved Contributing Zone Plan or Water Pollution Abatement Plan to be included or referenced as a part of the Stormwater Pollution Prevention Plan.

See maps on the TCEQ website to determine if the site is located within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer by entering the following link into an internet browser:

www.tceq.texas.gov/field/eapp/viewer.html or by contacting the TCEQ Water Quality Division at 512-239-4671 for assistance.

If the discharge or potential discharge is within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer, a site-specific authorization approved by the Executive Director under the Edwards Aquifer Protection Program (30 TAC Chapter 213) is required before construction can begin.

For questions regarding the Edwards Aquifer Protection Program, contact the appropriate TCEQ Regional Office. For projects in Hays, Travis and Williamson Counties: Austin Regional Office, 12100 Park 35 Circle, Austin, TX 78753, 512-339-2929. For Projects in Bexar, Comal, Kinney, Medina and Uvalde Counties: TCEQ San Antonio Regional Office, 14250 Judson Rd., San Antonio, TX 78233-4480, 210-490-3096.

Section 5. NOI CERTIFICATION

Note: Failure to indicate Yes to all of the certification items may result in denial of coverage under the general permit.

a) Certification of Understanding the Terms and Conditions of Construction General Permit (TXR150000)

Provisional coverage under the Construction General Permit (TXR150000) begins 7 days after the completed paper NOI is postmarked for delivery to the TCEQ. Electronic applications submitted through ePermits have immediate provisional coverage. You must obtain a copy and read the Construction General Permit before submitting your application. You may view and print the Construction General Permit for which you are seeking coverage at the TCEQ web site by entering the following link into an internet browser: www.tceq.texas.gov/goto/construction or you may contact the TCEQ Stormwater processing Center at 512-239-3700 for assistance.

b) Certification of Legal Name

The full legal name of the applicant as authorized to do business in Texas is required. The name must be provided exactly as filed with the Texas Secretary of State (SOS), or on other legal documents forming the entity, that is filed in the county where doing business. You may contact the SOS at 512-463 5555, for more information related to filing in Texas.

c) Understanding of Notice of Termination

A permittee shall terminate coverage under the Construction General Permit through the submittal of a NOT when the operator of the facility changes, final stabilization has

been reached, the discharge becomes authorized under an individual permit, or the construction activity never began at this site.

d) Certification of Stormwater Pollution Prevention Plan

The SWP3 identifies the areas and activities that could produce contaminated runoff at your site and then tells how you will ensure that this contamination is mitigated. For example, in describing your mitigation measures, your site's plan might identify the devices that collect and filter stormwater, tell how those devices are to be maintained, and tell how frequently that maintenance is to be carried out. You must develop this plan in accordance with the TCEQ general permit requirements. This plan must be developed and implemented before you complete this NOI. The SWP3 must be available for a TCEQ investigator to review on request.

Section 6. APPLICANT CERTIFICATION SIGNATURE

The certification must bear an original signature of a person meeting the signatory requirements specified under 30 Texas Administrative Code (TAC) §305.44.

If you are a corporation:

The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(1) (see below). According to this code provision, any corporate representative may sign an NOI or similar form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the NOI or similar form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.

If you are a municipality or other government entity:

The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(3) (see below). According to this code provision, only a ranking elected official or principal executive officer may sign an NOI or similar form. Persons such as the City Mayor or County Commissioner will be considered ranking elected officials. In order to identify the principal executive officer of your government entity, it may be beneficial to consult your city charter, county or city ordinances, or the Texas statute(s) under which your government entity was formed. An NOI or similar document that is signed by a government official who is not a ranking elected official or principal executive officer does not conform to §305.44(a)(3). The signatory requirement may not be delegated to a government representative other than those identified in the regulation. By signing the NOI or similar form, you are certifying that you are either a ranking elected official or principal executive officer as required by the administrative code. Documentation demonstrating your position as a ranking elected official or principal executive officer may be requested by the TCEQ.

If you have any questions or need additional information concerning the signatory requirements discussed above, please contact the TCEQ's Environmental Law Division at 512-239-0600.

30 Texas Administrative Code

§305.44. Signatories to Applications

(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the

corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

Texas Commission on Environmental Quality General Permit Payment Submittal Form

Use this form to submit your Application Fee only if you are mailing your payment.

Instructions:

- Complete items 1 through 5 below:
- Staple your check in the space provided at the bottom of this document.
- *Do not mail this form with your NOI form.*
- *Do not mail this form to the same address as your NOI.*

Mail this form and your check to either of the following:

By Regular U.S. Mail

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, TX 78711-3088

By Overnight or Express Mail

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, TX 78753

Fee Code: GPA General Permit: TXR150000

1. Check or Money Order No:
2. Amount of Check/Money Order:
3. Date of Check or Money Order:
4. Name on Check or Money Order:
5. NOI Information:

If the check is for more than one NOI, list each Project or Site (RE) Name and Physical Address exactly as provided on the NOI. **Do not submit a copy of the NOI with this form, as it could cause duplicate permit application entries!**

If there is not enough space on the form to list all of the projects or sites the authorization will cover, then attach a list of the additional sites.

Project/Site (RE) Name:

Project/Site (RE) Physical Address:

Staple the check or money order to this form in this space.

ATTACHMENT 2



SMALL CONSTRUCTION SITE NOTICE

FOR THE
 Texas Commission on Environmental Quality (TCEQ)
 Stormwater Program
TPDES GENERAL PERMIT TXR150000

The following information is posted in compliance with **Part II.E.2.** of the TCEQ General Permit Number TXR150000 for discharges of stormwater runoff from small construction sites. Additional information regarding the TCEQ stormwater permit program may be found on the internet at:

http://www.tceq.state.tx.us/nav/permits/wq_construction.html

Operator Name:	
Contact Name and Phone Number:	
Project Description: <i>Physical address or description of the site's location, estimated start date and projected end date, or date that disturbed soils will be stabilized</i>	
Location of Stormwater Pollution Prevention Plan:	

For Small Construction Activities Authorized Under Part II.E.2. (Obtaining Authorization to Discharge) the following certification must be completed:

I _____ (Typed or Printed Name Person Completing This Certification) certify under penalty of law that I have read and understand the eligibility requirements for claiming an authorization under Part II.E.2. of TPDES General Permit TXR150000 and agree to comply with the terms of this permit. A stormwater pollution prevention plan has been developed and will be implemented prior to construction, according to permit requirements. A copy of this signed notice is supplied to the operator of the MS4 if discharges enter an MS4. I am aware there are significant penalties for providing false information or for conducting unauthorized discharges, including the possibility of fine and imprisonment for knowing violations.

Signature and Title _____ Date _____

_____ Date Notice Removed

_____ MS4 operator notified per Part II.F.3.

ATTACHMENT 3

TPDES OPERATOR'S INFORMATION

Owner's Name and Address: City of Houston

Mr. _____
(City Official)

(Department)
1002 Washington Ave, 2nd FL
Houston, TX 77002
(832) 394-9108

Contractors' Names and Addresses:

General Contractor: _____

Telephone: _____

Site Superintendent: _____

Telephone: _____

Erosion Control and
Maintenance Inspection: _____

Telephone: _____

Subcontractors' Names and Addresses:

Phone: _____

Phone: _____

Note: Insert name, address, and telephone number of person or firms

ATTACHMENT 4

**CONTRACTOR'S / SUBCONTRACTOR'S
CERTIFICATION FOR TPDES PERMITTING**

I certify under penalty of law that I understand the terms and conditions of TPDES General Permit No. TXR150000 and the Storm Water Pollution Prevention Plan for the construction site identified as part of this certification.

Signature:

Name: (printed or typed)

Title:

Company:

Address:

Date:

Signature:

Name: (printed or typed)

Title:

Company:

Address:

Date:

Signature:

Name: (printed or typed)

Title:

Company:

Address:

Date:

ATTACHMENT 5



City of Houston
Storm Water Quality
Construction Site Activities Inspection Report

TCEQ Stormwater Discharge Permit Number _____

COH Storm Water Quality Permit Number _____

COH Building Permit Login Number _____

NAME _____ DATE _____

ADDRESS _____

- No exceptions noted.
The following deficiencies have been noted:
- NOI / Construction Site Notice Improperly Posted
- Stormwater Pollution Prevention Plan Incomplete or requires updating
- Copy of NOI / CSN not on site
- Storm Water Pollution Prevention Plan not on site
- Erosion and sediment controls improperly installed
- Erosion and sediment control devices improperly maintained
- Fueling/washout/chemical storage areas not properly protected
- Portocan or other sanitary facilities not properly protected or leaking
- Self-inspection and maintenance records incomplete
- Sediment from site outside area of construction
- Other (see description below)

The deficiencies must be corrected:
 immediately; within 48 hours;
 prior to re-inspection

Should the noted deficiencies not be corrected in the time frame indicated, further enforcement remedies will be sought.

For questions concerning the above:
Please contact the Storm Water Quality Group at
1002 Washington Avenue, 2nd Floor, Houston TX 77002
832-394-9108

Inspector's Name

Operator's Signature

Inspector's Cell Phone

Operator's Name
 not present

Distribution: white – Stormwater Quality Engineer gold – operator

ATTACHMENT 6

TCEQ Office Use Only
Permit No:
CN:
RN:
Region:



**Notice of Termination (NOT) for Authorizations under
TPDES General Permit TXR150000**

IMPORTANT INFORMATION:

Please read and use the General Information and Instructions prior to filling out each question in the form.

Effective September 1, 2018, this paper form must be submitted to TCEQ with a completed electronic reporting waiver form (TCEQ-20754).

ePermits: This form is available on our online permitting system.

Sign up for online permitting at: <https://www3.tceq.texas.gov/steers/>

What is the permit number to be terminated?

TXR15 [redacted] TXRCW [redacted]

Section 1. OPERATOR (Permittee)

a) What is the Customer Number (CN) issued to this entity?

CN [redacted]

b) What is the Legal Name of the current permittee?

[redacted]

c) Provide the contact information for the Operator (Responsible Authority).

Prefix (Mr. Ms. or Miss): [redacted]

First and Last Name: [redacted] Suffix: [redacted]

Title: [redacted] Credentials: [redacted]

Phone Number: [redacted] Fax Number: [redacted]

Email: [redacted]

Mailing Address: [redacted]

City, State, and Zip Code: [redacted]

Country Mailing Information, if outside USA: [redacted]

Section 2. APPLICATION CONTACT

This is the person TCEQ will contact if additional information is needed regarding this application.

Is the application contact the same as the permittee identified above?

Yes, go to Section 3.

No, complete section below

Prefix (Mr. Ms. or Miss): [REDACTED]

First and Last Name: [REDACTED] Suffix: [REDACTED]

Title: [REDACTED] Credentials: [REDACTED]

Phone Number: [REDACTED] Fax Number: [REDACTED]

Email: [REDACTED]

Mailing Address: [REDACTED]

City, State, and Zip Code: [REDACTED]

Country Mailing Information, if outside USA: [REDACTED]

Section 3. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE

a) TCEQ issued RE Reference Number (RN): RN [REDACTED]

b) Name of project or site as known by the local community: [REDACTED]

c) County, or counties if more than 1: [REDACTED]

d) Latitude: [REDACTED] Longitude: [REDACTED]

e) Site Address/Location:

If the site has a physical address such as 12100 Park 35 Circle, Austin, TX 78753, complete Section 3A.

If the site does not have a physical address, provide a location description in Section 3B. Example: located on the north side of FM 123, 2 miles west of the intersection of FM 123 and Highway 1.

Section 3A: Physical Address of Project or Site:

Street Number and Name: [REDACTED]

City, State, and Zip Code: [REDACTED]

Section 3B: Site Location Description:

Location description: [REDACTED]
[REDACTED]

City where the site is located or, if not in a city, what is the nearest city: [REDACTED]

Zip Code where the site is located: [REDACTED]

Section 4. REASON FOR TERMINATION

Check the reason for termination:

- Final stabilization has been achieved on all portions of the site that are the responsibility of the Operator and all silt fences and other temporary erosion controls have been removed, or scheduled for removal as defined in the SWP3.

- Another permitted Operator has assumed control over all areas of the site that have not been finally stabilized, and temporary erosion controls that have been identified in the SWP3 have been transferred to the new Operator.
- The discharge is now authorized under an alternate TPDES permit.
- The activity never began at this site that is regulated under the general permit.

Section 5. CERTIFICATION

Signatory Name: [REDACTED]

Signatory Title: [REDACTED]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code §305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signature (use blue ink): _____ Date: _____

Instructions for Notice of Termination (NOT) for Authorizations under TPDES General Permit TXR150000

GENERAL INFORMATION

Where to Send the Notice of Termination (NOT):

BY REGULAR U.S. MAIL:

Texas Commission on Environmental Quality
Stormwater Processing Center (MC-228)
P.O. Box 13087
Austin, Texas 78711-3087

BY OVERNIGHT/EXPRESS MAIL:

Texas Commission on Environmental Quality
Stormwater Processing Center (MC-228)
12100 Park 35 Circle
Austin, TX 78753

TCEQ Contact List:

Application status and form questions:	512-239-3700, swpermit@tceq.texas.gov
Technical questions:	512-239-4671, swgp@tceq.texas.gov
Environmental Law Division:	512-239-0600
Records Management - obtain copies of forms:	512-239-0900
Reports from databases (as available):	512-239-DATA (3282)
Cashier's office:	512-239-0357 or 512-239-0187

Notice of Termination Process:

A Notice of Termination is **effective on the date postmarked for delivery to TCEQ.**

When your NOT is received by the program, the form will be processed as follows:

- 1) Administrative Review: The form will be reviewed to confirm the following:
 - the permit number is provided;
 - the permit is active and has been approved;
 - the entity terminating the permit is the current permittee;
 - the site information matches the original permit record; and
 - the form has the required original signature with title and date.
- 2) Notice of Deficiency: If an item is incomplete or not verifiable as indicated above, a phone call will be made to the applicant to clear the deficiency. A letter will not be sent to the permittee if unable to process the form.
- 3) Confirmation of Termination: A Notice of Termination Confirmation letter will be mailed to the operator.

Change in Operator:

An authorization under the general permit is not transferable. If the operator of the regulated entity changes, the present permittee must submit a Notice of Termination and the new operator must submit a Notice of Intent. The NOT and NOI must be submitted not later than 10 days prior to the change in Operator status.

INSTRUCTIONS FOR FILLING OUT THE FORM

The majority of permit information related to the current operator and regulated entity are available at the following website: http://www2.tceq.texas.gov/wq_dpa/index.cfm.

Section 1. Operator (Current Permittee):

- a) Customer Number (CN)
TCEQ's Central Registry assigns each customer a number that begins with CN, followed by nine digits. This is not a permit number, registration number, or license number. The Customer Number, for the current permittee, is available at the following website:
http://www2.tceq.texas.gov/wq_dpa/index.cfm.

- b) Legal Name of Operator
The operator must be the same entity as previously submitted on the original Notice of Intent for the permit number provided. The current operator name, as provided on the current authorization, is available at the following website:
http://www2.tceq.texas.gov/wq_dpa/index.cfm.

- c) Contact Information for the Operator (Responsible Authority)
Provide information for person signing the NOT application in the Certification section. This person is also referred to as the Responsible Authority.

Provide a complete mailing address for receiving mail from the TCEQ. Update the address if different than previously submitted for the Notice of Intent or Notice of Change. The mailing address must be recognized by the US Postal Service. You may verify the address on the following website: <https://tools.usps.com/go/ZipLookupAction!input.action>.

The phone number should provide contact to the operator.

The fax number and e-mail address are optional and should correspond to the operator.

Section 2. Application Contact:

Provide the name, title and contact information of the person that TCEQ can contact for additional information regarding this application.

Section 3. Regulated Entity (RE) Information on Project or Site:

- a) Regulated Entity Reference Number (RN)
A number issued by TCEQ's Central Registry to sites where an activity regulated by TCEQ. This is not a permit number, registration number, or license number. The Regulated Entity Reference Number is available at the following website:
http://www2.tceq.texas.gov/wq_dpa/index.cfm.
- b) Name of the Project or Site
Provide the name of the site as known by the public in the area where the site is located.
- c) County
Identify the county or counties in which the regulated entity is located.
- d) Latitude and Longitude
Enter the latitude and longitude of the site in degrees, minutes, and seconds or decimal form. The latitude and longitude as provided on the current authorization is available at the following website: http://www2.tceq.texas.gov/wq_dpa/index.cfm.
- e) Site/Project (RE) Physical Address/Location Information
The physical address/location information, as provided on the current authorization, is available at the following website: http://www2.tceq.texas.gov/wq_dpa/index.cfm.

Section 3A. If a site has an address that includes a street number and street name, enter the complete address for the site. If the physical address is not recognized as a USPS delivery address, you may need to validate the address with your local police (911 service) or through an online map site used to locate the site. Please confirm this to be a complete and valid address. Do not use a rural route or post office box for a site location.

Section 3B. If a site does not have an address that includes a street number and street name, provide a complete written location description. For example: "The site is located on the north side of FM 123, 2 miles west of the intersection of FM 123 and Highway 1."

Provide the city (or nearest city) and Zip Code of the facility location.

Section 4. Reason for Termination:

The Notice of Termination form is only for use to terminate the authorization (permit). The Permittee must indicate the specific reason for terminating by checking one of the options. If the reason is not listed then provide an attachment that explains the reason for termination.

Please read your general permit carefully to determine when to terminate your permit. Permits will not be reactivated after submitting a termination form. The termination is effective on the date postmarked for delivery to TCEQ.

Section 5. Certification:

The certification must bear an original signature of a person meeting the signatory requirements specified under 30 Texas Administrative Code §305.44.

IF YOU ARE A CORPORATION:

The regulation that controls who may sign an application form is 30 Texas Administrative Code §305.44(a), which is provided below. According to this code provision, any corporate representative may sign an NOI or similar form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the NOI or similar form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.

IF YOU ARE A MUNICIPALITY OR OTHER GOVERNMENT ENTITY:

The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a), which is provided below. According to this code provision, only a ranking elected official or principal executive officer may sign an NOI or similar form. Persons such as the City Mayor or County Commissioner will be considered ranking elected officials. In order to identify the principal executive officer of your government entity, it may be beneficial to consult your city charter, county or city ordinances, or the Texas statutes under which your government entity was formed. An NOI or similar document that is signed by a government official who is not a ranking elected official or principal executive officer does not conform to §305.44(a) (3). The signatory requirement may not be delegated to a government representative other than those identified in the regulation. By signing the NOI or similar form, you are certifying that you are either a ranking elected official or principal executive officer as required by the administrative code. Documentation demonstrating your position as a ranking elected official or principal executive officer may be requested by the TCEQ.

If you have any questions or need additional information concerning the signatory requirements discussed above, please contact the Texas Commission on Environmental Quality's Environmental Law Division at 512-239-0600.

30 Texas Administrative Code §305.44. Signatories to Applications

(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

SECTION 01410
TPDES REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Documentation to be prepared and signed by Contractor/Operator before conducting construction operations, in accordance with the Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit Number TXR150000 issued on February 8, 2018 (the Construction General Permit).
- B. Implementation, maintenance inspection, and termination of storm water pollution prevention control measures including, but not limited to, erosion and sediment controls, storm water management plans, waste collection and disposal, off-site vehicle tracking, and other appropriate practices shown on the Drawings or specified elsewhere in the Contract.
- C. Review of the Storm Water Pollution Prevention Plan (SWP3) implementation in a meeting with Project Manager prior to start of Construction.

1.02 DEFINITIONS

- A. Commencement of Construction Activities: The exposure of soil resulting from activities such as clearing, grading, and excavation activities, as well as other construction related activities (e.g. stock piling of fill material, demolition).
- B. Large Construction Activity: Project that:
 - 1. disturbs five acres or more, or
 - 2. disturbs less than five acres but is part of a larger common plan of development that will disturb five acres or more of land.
- C. Small Construction Activity: Project that:
 - 1. disturbs one or more acres but less than five acres, or
 - 2. are part of a larger common plan of development that will disturb at least 1 but less than 5 Ac.

TPDES REQUIREMENTS

D. TPDES Operator:

1. Operator - The person or persons associated with a large or small construction activity that is either a primary or secondary as defined below:
 - a. Primary Operator – the person or persons associated with a large or small construction activity that meets either of the following two criteria:
 - (1) the persons have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or, the person or persons have day-to-day operational control of those activities at a construction site that are necessary to ensure compliance with a storm water pollution prevention plan (SWP3) for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).
 - b. Secondary Operator –The person or entity, often the property owner, whose operational control is limited to:
 - (1) the employment of other operators, such as a general contractor, to perform or supervise construction activities, or
 - (2) the ability to approve or disapprove changes to construction plans and specifications, but who does not have day-to-day on-site operational control over construction activities at the site.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SITE SPECIFIC STORM WATER POLLUTION PREVENTION PLAN (SWP3)

- A. Prepare a SWP3 following Part III of the Construction General Permit and the Storm Water Management Handbook for Construction Activities issued under City Ordinance Section 47-695(b). If conflicts exist between the Construction General Permit and the handbook, the more stringent requirement will apply.
- B. Update or revise the SWP3 as needed during the construction following Part III, Section E of the Construction General Permit.
- C. Submit the SWP3 and any updates or revisions to Project Manager for review and address comments prior to commencing, or continuing, construction activities.

3.02 NOTICE OF INTENT for Large Construction Activity

- A. Fill out, sign, and date TCEQ Form 20022 (03/06/2018) Notice of Intent (NOI) for an Authorization for Stormwater Discharges Associated with Construction Activity under TPDES General Permit TXR150000, ATTACHMENT 1 of this Section 01410.
- B. Transmit the signed Contractor's copy of TCEQ Form 20022 (03/06/2018), along with a \$325.00 check, made out to Texas Commission on Environmental Quality, and the completed Payment Submittal Form to Project Manager.
- C. Project Manager will complete a separate TCEQ Form 20022 (03/06/2018) for City's Notice of Intent, and will submit both Notices, along with checks for application fees, to the TCEQ.
- D. Submission of the Notice of Intent form by both the City and Contractor to CEQ if mailing is required a minimum of seven days before Commencement of Construction Activities.

3.03 CONSTRUCTION SITE NOTICE FOR SMALL CONSTRUCTION ACTIVITY

- A. Fill out, sign, and date the Construction Site Notice, Attachment 2 to TPDES General Permit TXR150000, "Small Construction Site Notice", ATTACHMENT 2 of this Section 01410.
- B. Transmit the signed Construction Site Notice to Project Manager at least seven days prior to Commencement of Construction Activity.

3.04 CERTIFICATION REQUIREMENTS

- A. Fill out TPDES Operator's Information form, ATTACHMENT 3 of this Section 01410, including Contractor's name, address, and telephone number, and the names of persons or firms responsible for maintenance and inspection of erosion and sediment control measures. Use multiple copies as required to document full information.
- B. Contractor and Subcontractors shall sign and date the Contractor's/ Subcontractor's Certification for TPDES Permitting, ATTACHMENT 4 of this Section 01410. Include this certification with other Project certification forms.
- C. Submit properly completed certification forms to Project Manager for review before beginning construction operations.
- D. Conduct inspections in accordance with TCEQ requirements. Ensure persons or firms responsible for maintenance and inspection of erosion and sediment control measures read, fill out, sign, and date the Erosion Control Contractor's certification for Inspection and Maintenance. Use the City of Houston Storm Water Pollution Prevention Plan,

Construction Site Inspection Report, ATTACHMENT 5 of this Section 01410 to record maintenance inspections and repairs.

3.05 RETENTION OF RECORDS

- A. Keep a copy of this document and the SWP3 in a readily accessible location at the construction site from Commencement of Construction Activity until submission of the Notice of Termination (NOT) for Storm Water Discharges Associated with Construction Activity under TPDES Construction General Permit (TXR150000). Contractors with day-to-day operational control over SWP3 implementation shall have a copy of the SWP3 available at a central location, on-site, for the use of all operators and those identified as having responsibilities under the SWP3. Upon submission of the NOT, submit all required forms and a copy of the SWP3 with all revisions to Project Manager.

3.06 REQUIRED NOTICES

- A. Post the following notices from effective date of the SWP3 until date of final site stabilization as defined in the Construction General Permit:
 - 1. Post the TPDES permit number for Large Construction Activity, with a signed TCEQ Construction Site Notice for large or Small Construction Activity. Signed copies of the City's and Contractor's NOI must also be posted.
 - 2. Post notices near the main entrance of the construction site in a prominent place where it is safely and readily available for viewing by General Public, Local, State, and Federal Authorities. Post name and telephone number of Contractor's local contact person, brief project description and location of the SWP3.
 - a. If posting near a main entrance is not feasible due to safety concerns, coordinate posting of notice with Project Manager to conform to requirements of the Construction General Permit.
 - b. If Project is a linear construction project (e.g.: road, utilities, etc.), post notice in a publicly accessible location near active construction. Move notice as necessary.
 - 3. Post a notice to equipment and vehicles operators, instructing them to stop, check, and clean tires of debris and mud before driving onto traffic lanes. Post at each stabilized construction access area.
 - 4. Post a notice of waste disposal procedures in a readily visible location on site.

3.07 ON-SITE WASTE MATERIAL STORAGE

- A. On-site waste material storage shall be self-contained and shall satisfy appropriate local, state, and federal rules and regulations.

TPDES REQUIREMENTS

- B. Prepare list of waste material to be stored on-site. Update list as necessary to include up-to-date information. Keep a copy of updated list with the SWP3.
- C. Prepare description of controls to reduce pollutants generated from on-site storage. Include storage practices necessary to minimize exposure of materials to storm water, and spill prevention and response measures consistent with best management practices. Keep a copy of the description with the SWP3.

3.8 NOTICE OF TERMINATION

- A. Submit a NOT, ATTACHMENT 6 of this Section 01410, to Project Manager within 30 days after:
 - 1. Final stabilization has been achieved on all portions of the site that are the responsibility of the Contractor; or,
 - 2. Another operator has assumed control over all areas of the site that have not been stabilized; and
 - 3. All sit fences and other temporary erosion controls have either been removed, scheduled to be removed as defined in the SWP3, or transferred to a new operator if the new operator has sought permit coverage.
- B. Project Manager will complete City's NOT and submit Contractor and City's notices to the TCEQ and MS4 entities.

END OF SECTION

SECTION 01423

REFERENCES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General quality assurance related to Reference Standards.
- B. List of references.
- C. List of definitions.
- D. List of phrases.

1.02 QUALITY ASSURANCE

- A. For work specified by association, trade, or Federal Standards, follow requirements of the standard, except when more rigid requirements are specified or are required by applicable codes or by Contract Documents.
- B. Follow reference standard effective on the date stated in Document 00700 - General Conditions.
- C. Submit Document 00685- Request for Information before proceeding if specified reference standards conflict with Contract Documents, or if no standards apply.

1.03 PARTIAL LIST OF REFERENCES

AA	Aluminum Association 900 19 th St. N.W. Washington, DC 20006 Ph: 202-862-5100	ASME	American Soc. of Mech. Engrs. Three Park Ave. New York, NY 10016-5902 Ph: 212-591-7733
AASHTO	Amer. Assoc. of State Hwy. Officials 444 North Capitol Street, N.W. #249 Washington, DC 20001 Ph: 202-624-5800	AI	Asphalt Institute Research Park Dr. P.O. Box 14052 Lexington, KY 40512-4052 Ph: 859-288-4960
ACI	American Concrete Institute P.O. Box 9094 Farmington Hills, MI 48333-9094 Ph: 248-848-3700	AITC	American Institute of Timber Construction 7012 S. Revere Pkwy, #140 Englewood, CO 80112 Ph: 303-792-9559
AGC	Associated General Contractors of America 333 John Carlyle St., #200 Alexandria, VA 22314 Ph: 703-548-3118	AISC	American Institute of Steel Construction 1 E. Wacker Dr., #3100 Chicago, IL 60601-2001 Ph: 312-670-2400

REFERENCES

- AISI American Iron & Steel Institute
1101 17th Street, N.W., #1300
Washington, DC 20036
Ph: 202-452-7100
- ANSI American Natl. Stds. Institute
25 W. 43rd St., 4 Floor
New York, NY 10036
Ph: 212-642-4900
- APA The Engineered Wood Assoc.
7011 So. 19th,
Tacoma, WA 98466
Ph: 253-565-6600
- API American Petroleum Institute
1220 L Street, N.W.
Washington, DC 20005-4070
Ph: 202-682-8000
- AREA Amer. Railway Engrg. Assoc.
8201 Corporate Dr., #1125
Landover, MD 20785
Ph: 301-459-3200
- ASTM American Soc. for Testing & Materials
100 Barr Harbor Dr.,
PO Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9585
- AWPA American Wood-Preservers' Association
PO Box 388
Selma, AL 36702-0388
Ph: 334-874-9800
- AWS American Welding Society
550 N.W. LeJeune Rd.
Miami, FL 33126
Ph: 800-443-9353
- AWWA Amer. Water Works Assoc.
6666 West Quincy Avenue
Denver, CO 80235
Ph: 303-794-7711
- BICSI Bldg. Industry Consulting Svc. Intl.
8610 Hidden River Pkwy.
Tampa, FL 33637-1000
Ph: 800-242-7405
- COH City of Houston
900 Bagby Street (Box 1562)
Houston, TX 77251-1562
Ph: 713-837-0311
- CLFMI Chain Link Fence Mfgs Inst.
10015 Old Columbia Rd., #B-215
Columbia, MD 21046
Ph: 301-596-2583
- CRSI Conc. Reinforced Steel Institute
933 N. Plum Grove Road
Schaumburg, IL 60173-4758
Ph: 847-517-1200
- EJMA Expansion Joint Manufacturers Assoc.
25 N. Broadway
Tarrytown, NY 10591
Ph: 914-332-0040
- FS Federal Standardization Documents
Gen. Svcs. Admin. Specificatns. Unit (WFSIS)
7th and D Streets, S.W. #6039
Washington, DC 20407
Ph: 202-472-2205
- HAS (City of) Houston Airport System
P.O. Box 60106 (16930 JFK Blvd., 77032)
Houston, TX 77205-0106
Ph: 281-233-3000
- HOU William P. Hobby Airport (Airport Manager)
7800 Airport Blvd.
Houston, Texas 77061
Ph: 713-640-3000
- IAH George Bush Intercontinental Airport Houston
(Airport Manager)
2800 N. Terminal Road
Houston, TX 77032
Ph: 281-230-3100
- ICEA Insulated Cable Engineer Association
P.O. Box 1568
Carrollton, GA 30112
- IEEE Institute of Electrical and Electronics Engineers
445 Hoes Lane, or P.O. Box 1331
Piscataway, NJ 08854-1331
Ph: 732-981-0060
- MIL Military Specifications (see "FS" for address)
- NACE National Association of Corrosion Engineers
440 1st St. N.W.
Washington, DC 20001
Ph: 202-393-6226
- NARTE National Association of Radio and
Telecommunications Engineers, Inc.
167 Village Street
P.O. Box 678
Medway, MA 02053
Ph: 508-533-8333, 800-896-2783
- NEMA National Electrical Manufacturers' Association
1300 North 17th Street, Suite 1847
Rosslyn, VA 22209
Ph: 703-841-3200
- NFPA National Fire Protection Association
1 Batterymarch Park, P.O. Box 9101
Quincy, MA 02169-7471
Ph: 617-770-3000
- OSHA Occupational Safety Health Administration

REFERENCES

	200 Constitution Avenue, NW Washington, DC 20210 Ph: 866-487-2365		Ph: 847-458-4647
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077-1083 Ph: 847-966-6200	SSPC	The Society for Protective Coatings 40 24 th Street, 6 th Floor Pittsburgh, PA 15222-4656 Ph: 412-281-2331
PCI	Prestressed Concrete Institute 201 North Wacker Drive Chicago, IL 60606 Ph: 312-786-0300	TAC	Texas Admin. Code, Texas Water Development Board Box 13231, Capitol Station Austin, TX 78711-3231 Ph: 512-463-7926
		UL	Underwriters' Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062-2096 Ph: 877- 854-3577, 800-285-4476
SDI	Steel Deck Institute P.O. Box 25 Fox River Grove, IL 60021	UNI-BELL	UNI-BELL Pipe Association 2655 Villa Creek Dr., Suite 155 Dallas, TX 75234 Ph: 972-243-3902

1.04 PARTIAL LIST OF DEFINITIONS

Airport: Area of land or water used or intended to be used for landing and takeoff of aircraft and includes buildings and facilities. Airports under control of City are certificated by FAA under FAR Part 139 and operate under specific safety requirements applicable to maintenance and construction activities.

Airport Manager: Individual delegated by Director of Department of Aviation, with absolute responsibility and authority for overall airport operation and compliance with FAR Part 139. Airport Manager shall communicate with Contractor through City Engineer except in case of emergency when City Engineer is not present. The Airport Manager may delegate responsibilities to other persons, such as airport electricians to coordinate lockouts/tag-outs.

Air Operations Area (AOA): Any area of Airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft, including paved or unpaved areas used or intended to be used for unobstructed movement of aircraft in addition to associated runway, taxiway, or apron. The AOA includes any adjacent areas (such as general aviation areas) that are not separated by adequate security systems, measures, or procedures.

Airport Security Officers: 1) Uniformed City of Houston Police (HPD) officers enforcing airport regulations and apprehension of unauthorized personnel in security areas; 2) Non-uniformed federal or local government personnel authorized to test for compliance with existing regulations.
Air Traffic Control Tower (ATCT): Person responsible for positive control of aircraft and vehicle traffic, including Contractor's, on and around runways, taxiways, and aprons.
Base Facility: Existing structure upon and within which the Work is constructed. "Existing construction" and "existing" mean the same as Base Facility.

REFERENCES

1. By way of general description, Base Facility includes sidewalks and pavement; foundations; superstructure columns, beams and floors; exterior and interior walls, partitions and doors; mechanical and electrical systems; conveying systems; interior finish materials.
 - a. Underground structures include sewer, water, gas, fuel and other piping, and manholes, chambers, electrical and signal conduits, ducts, tunnels, manholes and other means of access, foundations and below-ground extensions of surface structures and other existing subsurface Work located within or adjacent to the limits of the Work.
 - b. Surface structures include existing buildings, tanks, masts and poles, navigational aids, walls, bridges, roads, dams, channels, open drainage, piping, wires, posts, signs, markers, curbs, walks, pavements and surfaces for wheeled vehicles (including aircraft), guard cables, fencing, lighting and similar constructs above the ground surface or visible without excavation, demolition or cutting.

DOT: Acronym for U.S. Department of Transportation.

Emergency Medical Service: Operational division of Houston Fire Department.

Emergency Vehicles: ARFF, HPD and EMS vehicles operating in emergency mode.

Federal Aviation Administration (FAA): Agency of U.S. Department of Transportation. FAA also means FAA's Administrator or Administrator's duly authorized representative.

Ground Support Equipment (GSE): Mobile and stationary vehicles and equipment for servicing aircraft.

Navigation Aids (NAVAIDS): Equipment used to locate aircraft and direct movement while airborne.

Public areas: Areas where no accessibility restrictions are imposed, generally including roadways, streets, parking lots and structures, and building interiors up to but not including baggage and passenger checkpoints at concourses.

Secured Area: Any portion of the airport where aircraft operators (and foreign air carriers that have a security program under part 1544 or 1546) enplane and deplane passengers, sort and load baggage, and any adjacent areas not separated by adequate security measures.

Security Areas, Security Identification Areas (SIDAs): 1.) AOA; 2) Secured Areas: Exterior or interior areas the access to which is controlled by authorized security personnel or by keyed or electronic locks, and which may have posted notice of restricted access.

REFERENCES

Traffic Activity: In-the-air or on-the-ground aircraft and emergency vehicle activity that, determined by ATCT, Airport Manager or City Engineer because of safety reasons, prohibits the start, continuation or completion of construction operations.

Transportation Security Administration (TSA): Agency of U.S. Department of Transportation charged with implementing and enforcing federal airport security rules and regulations. TSA also means TSA's Undersecretary or the Undersecretary 's duly authorized representative(s).

TSR: an acronym for Transportation Security Regulation.

1.05 PARTIAL LIST OF PHRASES

- A. Read "includes" and "including" as having the phrase "but not necessarily limited to" immediately following the words, if not otherwise written out.
- B. "Required" means products, labor and services provided by the Contractor to properly complete the Work following the Contract Documents and the design concept expressed therein, such required work being determined and governed by field or shop conditions.

1.06 PARTIAL LIST OF ABBREVIATIONS AND ACRONYMS

- A. Following abbreviations and acronyms may appear on Drawings and in other Sections:
 - 1. CFP: City-furnished product(s).
 - 2. CSP: Contractor-salvaged product(s).
 - 3. NIC or N.I.C.: Not in contract.
 - 4. NOTAM: Notice to Airman.
 - 5. PDC: Department of Aviation Planning Design Construction Group.
 - 6. RFI: Request for Information/Clarification.
 - 7. RFP: Request for Proposal.
 - 8. WCD: Work Change Directive.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

REFERENCES

END OF SECTION

REFERENCES

01423-6 rev. 10.10.06

SECTION 01450
CONTRACTOR'S QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General requirements for Contractor's quality control services.
- B. Contractor's responsibilities related to City's testing are specified in Section 01455 - City's Acceptance Testing.

1.02 GENERAL

- A. Maintain source and on-site quality control over suppliers, manufacturers, products, services, site conditions, quality assurance programs, and workmanship, to provide work of required quality at no additional cost to the City.
- B. Follow manufacturers' installation instructions, including each step-in sequence.
- C. Request clarification from City Engineer before proceeding should manufacturers' instructions conflict with Contract Documents.
- D. Follow specified standards as minimum requirements for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce the specified level of workmanship.
- F. Observe, inspect, collect samples and test samples of the Work as it progresses and as required for compliance with Document 00700 - General Conditions Paragraph 3.2.
 - 1. At Contractor's discretion, retain a testing laboratory to supplement manufacturers' own product testing programs, except do not retain the same testing laboratory retained by City under Section 01455 - City's Acceptance Testing.
 - 2.
 - 2. Additional responsibilities of Contractor related to testing are specified in Section 01455 - City's Acceptance Testing.

1.03. CONTRACTOR'S QUALITY ASSURANCE PROGRAM (QAP)

CONTRACTOR'S QUALITY CONTROL

- A. Implement and maintain a QAP of inspection, sampling, testing, and observation and test results reporting for the Work, applicable to product source, fabrication, mixing, and through final installation, to provide proper work.

- B. Submit required submittals and requests for information (RFIs) into the HAS's web-based application, Microsoft SharePoint. Access to the SharePoint portal and required training will be coordinated through the Project Manager. Submit Contractor's Quality Assurance Program (QAP), following Section 01340 - Shop Drawings, Product Data and Samples, with following minimum information:
 - 1. Organization chart indicating Contractor's QAP personnel.
 - 2. Inspection, Sampling and Testing Matrix/ Schedule: Overlaid with requirements of Section 01325 - Construction Schedules and Section 01455 - City's Acceptance Testing.
 - 3. Sample QAP reporting forms.
 - 4. Procedures for action to correct defective work.
 - 5. Procedures to implement and manage the QAP.
 - 6. Submit one copy of Contractor's written QAP Inspection, Test, and Daily Reports to City and one copy to ITL, on a daily basis, indicating:
 - a. Project Name, Number, CIP Number.
 - b. Date/time of inspection/sampling/test, and quantity of product involved.
 - c. Product or installation batch, mill number, or production run number, and method used to assure statistically based random sampling following ASTM D3665.
 - d. Environmental conditions where applicable to results.
 - e. Name and signature of observer or tester, certifying as follows:

"The above work was inspected/sampled and tested in the manner described, and the result(s) are hereby certified by the undersigned as complete and accurate."
 - f. Product or installation inspected, by Section number, and location of inspection (such as product source, fabrication shop, or on site), and quantity of product tested.
 - g. Location in the Work, by Drawing/detail number, floor number, range/station number, or other specific identifier traceable to the Drawings.

CONTRACTOR'S QUALITY CONTROL

- h. Type of inspection or test (such as visual; non-destructive X-ray), and type of test by referenced standard test number.
 - i. Type of inspection, sample or test products used.
 - j. Performance standard required.
 - k. Factual evidence and results of inspections, measurements or tests stated as "pass" or "fail."
 - l. Factual evidence and record of observations and tests. Include nature and type of failure, and comments as applicable.
- C. Contractor's QAP Personnel for Sitework:
- 1. Quality Control Manager: Sole responsibility for management, implementation and control of the QAP; an employee of Contractor and specialist in type of applicable construction. If not an officer of firm, this person shall report to an officer.
 - a. Duties and Responsibilities: Plan, organize, staff, direct and control the QC Program; supervise QCTs (below); collate and review detail reports of QC activities for accuracy and completeness before publication, and prepare factual summary reports. The QCM may work projects other than this project, except QCM shall be present at times of sampling, testing or observation, within 2 hours of notice.
 - b. Demonstrated experience in parking garage paving construction and quality assurance compliance equivalent in scope and complexity to work of this contract, plus one of the following minimums:
 - 1) Registered civil engineer, with 1 year above experience.
 - 2) Engineer-in-Training, with 2 years above experience.
 - 3) Graduate Bachelor of Science degree in Civil Engineering, Civil Engineering Technology or Construction, with 3 years above experience.
 - 4) National Institute for Certification in Engineering Technologies (NICET), Level III, certified Construction Materials Technician, Highway Materials Technician, or Highway Construction Technician, with 4 years above experience.
 - 5) NICET-certified Civil Engineering Technician, with 5 years above experience, and approved by the City Engineer.
 - 2. Quality Control Technicians (QCT): Responsibility for processing this QC Program; report to the QCM.

CONTRACTOR'S QUALITY CONTROL

- a. Duties and Responsibilities: Inspect work, collect samples, take measurements, test work, collate test and measurement data, and prepare factual, accurate and complete reports. Use as many QCTs as required. QCTs may be Contractor's employees or personnel of a qualified ITL subcontracted to the Contractor, except do not use City's ITL to fulfill Contractor's testing requirements.
 - b. Demonstrated experience in same construction as QCM, and quality assurance compliance equivalent in scope and complexity to work of this contract, plus one of the following minimums:
 - 1) Engineer or Engineering Technician, with 1 year above experience.
 - 2) NICET Level II or higher certification as Construction Materials Technician, Highway Materials Technician, or Highway Construction Technician, , with 2 years above experience.
 3. Equivalent certifications by authorities other than NICET may be substituted following Section 01630.
- D. Contractor's QAP Personnel for Buildings:
1. Quality Control Manager: Sole responsibility for management, implementation and control of the QAP; an employee of the Contractor and specialist in type of applicable construction. If not an officer of firm, this person shall report to an officer.
 - a. Duties and Responsibilities: Plan, organize, staff, direct and control the QC Program; supervise QCT staff (below); collate and review detail reports of QC activities for accuracy and completeness before publication, and prepare factual summary reports. The QCM may work projects other than this project, except QCM shall be present at times of sampling, testing or observation, within 2 hours of notice.
 - b. Demonstrated experience in building Structural construction and quality assurance compliance equivalent in scope and complexity to work of this contract, plus one of the following minimums:
 - 1) Registered structural engineer, with 1 year above experience.
 - 2) Engineer-in-Training, with 2 years above experience.
 - 3) Graduate Bachelor of Science degree in structural engineering, with 3 years above experience.
 2. Quality Control Technicians (QCT): Responsibility for processing QAP; report to the QCM.

- a. Duties and Responsibilities: Inspect work, collect samples, take measurements, test work, collate test and measurement data, and prepare factual, accurate and complete reports. Use as many QCTs as required. QCTs may be Contractor's employees or personnel of a qualified ITL subcontracted to the Contractor, except do not use City's ITL to fulfill Contractor's testing requirements.
- b. Engineer or Engineering Technician, with minimum 1 year demonstrated experience in same construction as QCM, and quality assurance compliance equivalent in scope and complexity to work of this contract.

1.03 REFERENCES

- A. Obtain copies of referenced standards and maintain at site when required by other Sections.

1.04 MANUFACTURER'S FIELD SERVICES

- A. When specified in other Sections or when conditions are required to maintain schedule, cost or quality control, provide services of properly qualified manufacturer's or supplier's technical representative(s) to observe field conditions, conditions of substrates and installation, quality of workmanship, startup, testing, adjusting, balancing, demonstration and City-personnel training as required.
- B. Within 14 days of observation, submit a written report to City Engineer, prepared by manufacturer's representative, documenting their observations, supplementary instructions and instructions at variance with manufacturer's written instructions, and, where applicable, recommendations for corrective action. Costs and time for corrective action is Contractor's responsibility, without increase in Contract Sum or Time.

1.05 SUBCONTRACTS

- A. Coordinate work of subcontractors. Inform subcontractors of relation of their work to that of other subcontractors and Separate Contractors and direct scheduling of work to prevent conflicts or interferences.
- B. Employ subcontractors with documented proof of proper completion of two projects during the past 3 years of work similar in scope, type and quality as that required for this contract.

1.06 EXAMINATION AND PREPARATORY WORK

- A. Carefully examine substrates whether Base Facility or provided as part of the Work before commencing work applied to or accommodated by substrates. Proceed after unsatisfactory conditions are corrected, and after substrate work is properly prepared and complete.

- B. Take field dimension and establish and maintain lines, dimensions, and benchmarks as required to control proper fabrication and installation of work.
- C. Do not proceed with affected work until unsatisfactory site conditions and substrates are correct.
 - 1. Make written notification of scope and type of corrections required of separate contracts.
- D. Repair remaining substrates following Section 01731 - Cutting and Patching.

1.07 CONTRACTOR'S TESTING

- A. Follow Document 00700 - General Conditions Paragraphs 3.9.2 and this Section 01450.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 INSPECTIONS BY BUILDING OFFICIALS AND OTHER AGENCIES

- A. Immediately notify City Engineer of the date of inspections by governing authorities, in order for City Engineer to attend.

END OF SECTION

SECTION 01455
CITY'S ACCEPTANCE TESTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. City will retain an Independent Testing Laboratory (ITL) for following services:
1. Collect product samples at source, site of fabrication, or project site as required by referenced test procedure, as specified herein or in other Sections.
 2. Test product samples at source, site of fabrication, project site or in ITL's laboratory as required by referenced test procedure, as specified herein or in other Sections.
 3. Inspect execution of work at source, site of fabrication, or project site, as applicable, as specified herein or in other Sections.
 4. Record and distribute observations of work during inspections, indicating "pass" or "fail."
 5. Record and distribute results of tests, indicating "pass" or "fail."
 6. ITL does not have authority to:
 - a. Release, revoke, alter, or enlarge requirements of Contract Documents.
 - b. Approve or accept work.
 - c. Assume duties of Contractor.
 - d. Stop the Work or a part thereof.

1.02 CONTRACTOR'S RESPONSIBILITIES

- A. Notify City Engineer, ITL and Designer minimum 24 hours prior to expected time for inspections or sample collections. Schedule ITL's, City Engineer's, and Designer's presence for timely inspections, observations, and sample collection without delay to the Work.
- B. Provide access to the Work and cooperate with ITL for inspection and sample collection.
- C. Furnish samples of manufactured products to ITL for inspection and testing.

CITY'S ACCEPTANCE TESTING

- D. Provide incidental labor, products, services and facilities for sample collection and for transportation and handling of samples to ITL's vehicle or to ITL's on-site test facility.
- E. Reimburse City by Modification (Section 01255 - Modification Procedures) for costs of retesting previously "failed" work, including time expended by City's personnel related thereto.
- F. Time delays and costs resulting from ill-timed QC work are the Contractor's responsibility, without increase in Contract Time or Price.
- G. Follow Document 00700 - General Conditions Paragraph 3.2 and Section 01450- Contractor's Quality Control.
- H. Perform work following requirements of Contract Documents.
- I. Read reports of failed tests or measurements. Implement corrective actions to prevent defective work from proceeding farther.
- J. Stop affected work when corrective action fails to bring work to required standards.
- K. Remove defective work following Section 01731 and replace with proper work.
- L. Inspect, sample and test Base Facility Section 01726, as required to determine and confirm acceptability of existing construction as substrate for new construction.
- M. If Contractor employs a testing laboratory, follow ASTM D3740 and ASTM E329, plus other test standards specified in other Sections.
- N. Contractor shall not:
 - 1. Employ for Contractor's quality assurance testing the same ITL employed by the City for this Project.
 - 2. Retain possession of ITL's samples.

1.03 SUBMITTALS BY ITL

- A. Submit 3 copies of following to City:
 - 1. Written certification of compliance with following:
 - a. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - b. ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

2. Copy of latest inspection report by Materials Reference Laboratory/ National Bureau of Standards (NBS) or inspection traceable thereto, with statement of remedies of deficiencies.
 3. Invoice for retesting previously "failed" work.
- B. Submit 5 copies of following, 3 to City, 2 to Contractor. Immediately transmit "fail" reports by facsimile directly to City and to Contractor.
1. Project Name, Number, CIP Number.
 2. Identify ITL, Contractor, Subcontractor or Supplier, Section number and name, generic and manufacturer's name of product, numerical sequence when more than one inspection, sample or test of the same product is made, date and time of each inspection, sample collection or test, and applicable Drawing detail number.
 3. Date/time of inspection/sampling/test, and quantity of product involved.
 4. Product or installation batch, mill number, or production run number, and method used to assure statistically based random sampling following ASTM D3665.
 5. Environmental conditions where applicable to results.
 6. Name and signature of observer or tester, certifying as follows:
"The above work was inspected/sampled and tested in the manner described, and the result(s) are hereby certified by the undersigned as complete and accurate."
 7. Product or installation inspected, by Section number, and location of inspection (such as product source, fabrication shop, or on site), and quantity of product tested.
 8. Location in the Work, by Drawing/detail number, floor number, range/station number, or other specific identifier traceable to the Drawings.
 9. Type of inspection or test (such as visual; non-destructive X-ray), and type of test by ASTM or other reference standard test number.
 10. Type of inspection, sample or test equipment used.
 11. Performance standard required
 12. Factual evidence and results of inspections, measurements or tests stated as "pass" or "fail."
 13. Factual evidence and record of observations and tests. Include nature and type of failure, and comments as applicable. Furnish graphic or narrative data, or both,

indicating nominal requirements and actual test values. Indicate type and numerical value of deviations from specified requirements.

14. For submittals using SI (metric) measure as the ITL's standard, include corresponding Imperial measure conversions. Follow Section 01610 - Basic Product Requirements.
- C. Print and distribute copies of records.
- D. Transmit reports within 7 days of observations, inspections or test completion, except where shorter processing time is required due to possibility of Contractor continuing installation of "failing" work.
- E. For data in the form of drawings:
1. Submit one vellum sepia or electrostatic transparency (emulsion side "up") with one diazo print to City Engineer. Submit one diazo print to Contractor.
 2. Sheet Size: 8-1/2 x 11 inches minimum; 44 x 34 inches maximum.
 3. If CADD is used, prepare documents readable, writable and printable using IBM PC-compatible hardware and software, based on AutoCAD (11 or later versions) or software translated thereto. Provide copy of AutoCAD data disks to City Engineer
 4. Prepare drawings by qualified drafters.
 5. Draw to scale, and accurately represent products.
- F. For statistical records in the form of spreadsheets or graphs:
1. Submit electrostatic prints.
 2. Sheet Size: 8-1/2 x 11 inches minimum; 11 x 17 inches maximum.
 3. Provide copy of data disks to City Engineer at completion of the Work.

PART 2 PRODUCTS

2.01 SAMPLING AND TEST EQUIPMENT

- A. Provide and maintain in proper function sampling and test equipment of type and quantity required, with calibration and accuracy traceable to NBS.

PART 3 EXECUTION

3.01 GENERAL PROCEDURES

- A. Follow requirements of individual Sections.
- B. Coordinate inspections, sampling and testing with construction progress and Contractor's schedule specified in Section 01325 - Construction Schedules.
- C. At least once per shift inspect mixing, fabrication and installation of soil, cementitious and petroleum-based products for proper operation or tolerances. Confirm installers and tool operators are qualified, and tools are properly functioning.
- D. Sample at frequencies following requirements of applicable Sections or as specified herein and test each sample.
- E. Take quantity, linear, volume and bulk measurements as frequently as necessary to control mixing, fabrication and installation.
- F. Properly calibrate test equipment and measuring tools before use.
- G. Immediately report failed tests or measurements.
- H. Test work for proper function and performance as specified herein and in other Sections.

INSPECTION AND OBSERVATION

- A. Inspect work by properly experienced personnel. Observe mixing, fabrication and installation procedures. Record observations.
- B. Inspect at frequency indicated, using visual observation and measuring tools appropriate to the work. If not otherwise required in other Sections, inspect product source at the site of origin.

3.03 SAMPLING

- A. Unless otherwise indicated in Sections or otherwise required by test standard, randomly collect 3 samples and maintain possession until observation and testing is complete and results documented.
- B. Collect and handle samples following test standard.
- C. Coordinate operations with Contractor.

3.04 TESTING

- A. Test products *in situ* as approved by City Engineer or in laboratory where destructive tests are required, test to product failure. Note factual observations, test results, and measuring equipment setup, typed or legibly handwritten. For graph illustrations, use

computerized database or spreadsheets.

- B. Store and cure samples following test standards or as required to maintain samples in pristine condition until tested.
- C. Test samples for conformance with requirements.
- D. Follow test standards specified herein and in other Sections.

3.05 SCHEDULE OF INSPECTIONS, SAMPLES AND TESTS

- A. Observe mixing, fabrication and installation, and inspect, collect samples and test, as indicated in applicable Sections.

END OF SECTION

SECTION 01457
ESTIMATING PERCENTAGE OF
MATERIAL WITHIN SPECIFICATION LIMITS (PWL)

PART 1 GENERAL

When the specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined in accordance with this section. All test results for a lot will be analyzed statistically to determine the total estimated percent of the lot that is within specification limits. The PWL is computed using the sample average (\bar{X}) and sample standard deviation (S_n) of the specified number (n) of sublots for the lot and the specification tolerance limits, L for lower and U for upper, for the particular acceptance parameter. From these values, the respective Quality index(s), Q_L for Lower Quality Index and/or Q_U for Upper Quality Index, is computed and the PWL for the lot for the specified n is determined from Table 1. All specification limits specified in the technical sections shall be absolute values. Test results used in the calculations shall be to the significant figure given in the test procedure.

There is some degree of uncertainty (risk) in the measurement for acceptance because only a small fraction of production material (the population) is sampled and tested. This uncertainty exists because all portions of the production material have the same probability to be randomly sampled. The Contractor's risk is the probability that material produced at the acceptable quality level is rejected or subjected to a pay adjustment. The Owner's risk is the probability that material produced at the rejectable quality level is accepted.

IT IS THE INTENT OF THIS SECTION TO INFORM THE CONTRACTOR THAT, IN ORDER TO CONSISTENTLY OFFSET THE CONTRACTOR'S RISK FOR MATERIAL EVALUATED, PRODUCTION QUALITY (USING POPULATION AVERAGE AND POPULATION STANDARD DEVIATION) MUST BE MAINTAINED AT THE ACCEPTABLE QUALITY SPECIFIED OR HIGHER. IN ALL CASES, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PRODUCE AT QUALITY LEVELS THAT WILL MEET THE SPECIFIED ACCEPTANCE CRITERIA WHEN SAMPLED AND TESTED AT THE FREQUENCIES SPECIFIED.

1.01 SECTION INCLUDES

- A. Statistical analysis to determine the total estimated percent of the lot within specification limits.
- B. Method for computations.
- C. Table of values for Q_L and Q_U .
- D. Product sampling and testing is specified in Section 01455.

ESTIMATING PERCENTAGE OF PWL

1.02 DEFINITIONS

- A. Percent Within Limits (PWL): Statistically based evaluation method, where the PWL is computed on a lot basis, using the average (\bar{X}) and standard deviation (S_n) of the specified number (n) of subplot tests for the lot and the specified tolerance limits (L for lower and U for upper) for the particular acceptance parameter.
1. From these values, the respective Quality indices (Q_L for Lower Quality Index and/or Q_U for Upper Quality Index) are computed and the PWL for the specified n is determined from Table 1.

1.03 METHOD FOR COMPUTING PWL

- A. The computational sequence for computing PWL is as follows:
1. Divide the lot into n sublots in accordance with the acceptance requirements of the specification.
 2. Locate the random sampling position within the subplot in accordance with the requirements of the specification.
 3. Make a measurement at each location or take a test portion and make the measurement on the test portion in accordance with the testing requirements of the specification.
 4. Find the sample average (\bar{X}) for all subplot values within the lot by using the following formula:

$$\bar{X} = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

Where: \bar{X} = Sample average of all subplot values within a lot
 x_1, x_2 = Individual subplot values
 n = Number of sublots

5. Find the sample standard deviation (S_n) by use of the following formula:

$$S_n = [(d_1^2 + d_2^2 + d_3^2 + \dots + d_n^2)/(n-1)]^{1/2}$$

Where: S_n = Sample standard deviation of the number of subplot values in the set
 d_1, d_2, \dots = Deviations of the individual subplot values x_1, x_2, \dots from the average value \bar{X}
that is: $d_1 = (x_1 - \bar{X}), d_2 = (x_2 - \bar{X}) \dots d_n = (x_n - \bar{X})$
 n = Number of sublots

6. For single sided specification limits (i.e., L only), compute the Lower Quality Index Q_L by use of the following formula:

ESTIMATING PERCENTAGE OF PWL

$$Q_L = (X - L) / S_n$$

Where: L = specification lower tolerance limit

Estimate the percentage of material within limits (PWL) by entering Table 1 with Q_L , using the column appropriate to the total number (n) of measurements. If the value of Q_L falls between values shown on the table, use the next higher value of PWL.

7. For double-sided specification limits (i.e. L and U), compute the Quality Indexes Q_L and Q_U by use of the following formulas:

$$Q_L = (X - L) / S_n \text{ and } Q_U = (U - X) / S_n$$

Where: L and U = specification lower and upper tolerance limits

Estimate the percentage of material between the lower (L) and upper (U) tolerance limits (PWL) by entering Table 1 separately with Q_L and Q_U , using the column appropriate to the total number (n) of measurements, and determining the percent of material above P_L and percent of material below P_U for each tolerance limit. If the values of Q_L fall between values shown on the table, use the next higher value of P_L or P_U . Determine the PWL by use of the following formula:

$$PWL = (P_U + P_L) - 100$$

Where: P_L = percent within lower specification limit
 P_U = percent within upper specification limit

EXAMPLE OF PWL CALCULATION

Project: Example Project

Test Item: Item P-401, Lot A.

B. PWL Determination for Mat Density.

1. Density of four random cores taken from Lot A.

A-1 96.60
A-2 97.55
A-3 99.30
A-4 98.35
n = 4

2. Calculate average density for the lot.

$$X = (x_1 + x_2 + x_3 + \dots + x_n) / n$$
$$X = (96.60 + 97.55 + 99.30 + 98.35) / 4$$
$$X = 97.95 \text{ percent density}$$

ESTIMATING PERCENTAGE OF PWL

3. Calculate the standard deviation for the lot.

$$S_n = [((96.60 - 97.95)^2 + (97.55 - 97.95)^2 + (99.30 - 97.95)^2 + (98.35 - 97.95)^2) / (4 - 1)]^{1/2}$$
$$S_n = [(1.82 + 0.16 + 1.82 + 0.16) / 3]^{1/2}$$
$$S_n = 1.15$$

4. Calculate the Lower Quality Index Q_L for the lot. (L=96.3)

$$Q_L = (X - L) / S_n$$
$$Q_L = (97.95 - 96.30) / 1.15$$
$$Q_L = 1.4348$$

5. Determine PWL by entering Table 1 with $Q_L = 1.44$ and $n = 4$.

$$PWL = 98$$

C. PWL Determination for Air Voids.

1. Air Voids of four random samples taken from Lot A.

A-1	5.00
A-2	3.74
A-3	2.30
A-4	3.25

2. Calculate the average air voids for the lot.

$$X = (x_1 + x_2 + x_3 \dots + x_n) / n$$
$$X = (5.00 + 3.74 + 2.30 + 3.25) / 4$$
$$X = 3.57 \text{ percent}$$

3. Calculate the standard deviation S_n for the lot.

$$S_n = [((3.57 - 5.00)^2 + (3.57 - 3.74)^2 + (3.57 - 2.30)^2 + (3.57 - 3.25)^2) / (4 - 1)]^{1/2}$$
$$S_n = [(2.04 + 0.03 + 1.62 + 0.10) / 3]^{1/2}$$
$$S_n = 1.12$$

4. Calculate the Lower Quality Index Q_L for the lot. (L= 2.0)

$$Q_L = (X - L) / S_n$$
$$Q_L = (3.57 - 2.00) / 1.12$$
$$Q_L = 1.3992$$

5. Determine P_L by entering Table 1 with $Q_L = 1.41$ and $n = 4$.

$$P_L = 97$$

6. Calculate the Upper Quality Index Q_U for the lot. ($U = 5.0$)

$$Q_U = (U - X) / S_n$$
$$Q_U = (5.00 - 3.57) / 1.12$$
$$Q_U = 1.2702$$

7. Determine P_U by entering Table 1 with $Q_U = 1.29$ and $n = 4$.

$$P_U = 93$$

8. Calculate Air Voids PWL

$$PWL = (P_L + P_U) - 100$$
$$PWL = (97 + 93) - 100 = 90$$

EXAMPLE OF OUTLIER CALCULATION (Reference ASTM E 78)

Project: Example Project
Test Item: Item P-401, Lot A.

- D. Outlier Determination for Mat Density.

1. Density of four random cores taken from Lot A. arranged in descending order.

A-3 99.30
A-4 98.35
A-2 97.55
A-1 96.60

2. Use $n=4$ and upper 5 percent significance level of to find the critical value for test criterion = 1.463.
3. Use average density, standard deviation, and test criterion value to evaluate density measurements.

- a. For measurements greater than the average:

If: $(\text{measurement} - \text{average}) / (\text{standard deviation})$ is less than test criterion,
Then: the measurement is not considered an outlier for A-3 Check if $(99.30 - 97.95) / 1.15$ greater than 1.463
1.174 is less than 1.463, the value is not an outlier

- b. For measurements less than the average:

ESTIMATING PERCENTAGE OF PWL

If $(\text{average} - \text{measurement}) / (\text{standard deviation})$ is less than test criterion, then the measurement is not considered an outlier for A-1 Check if $(97.95 - 96.60) / 1.15$ greater than 1.463

1.0 is less than 1.463, the value is not an outlier

NOTE: In this example, a measurement would be considered an outlier if the density was:
greater than $(97.95 + 1.463 \times 1.15) = 99.63$ percent or,
less than $(97.95 - 1.463 \times 1.15) = 96.27$ percent

**ESTIMATING PERCENTAGE OF MATERIAL
WITHIN SPECIFICATION LIMITS (PWL)**

TABLE 1. TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)								
Percent Within Limits (P _L and P _U)	Positive Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4717	1.4829	1.4914
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653
87	1.0597	1.1100	1.1173	1.1192	1.1199	1.1204	1.1208	1.1212
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990
83	0.9939	0.9900	0.9785	0.9715	0.9671	0.9643	0.9624	0.9610
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686
70	0.6787	0.6000	0.5719	0.5582	0.5504	0.5454	0.5419	0.5394
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537
66	0.5563	0.4800	0.4545	0.4424	0.4355	0.4310	0.4280	0.4257
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4030	0.4001	0.3980
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892

TABLE 1. TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)

ESTIMATING PERCENTAGE OF PWL

**ESTIMATING PERCENTAGE OF MATERIAL
WITHIN SPECIFICATION LIMITS (PWL)**

Percent Within Limits (P _L and P _U)	Positive Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2093
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566
55	0.1806	0.1500	0.1406	0.1363	0.1338	0.1322	0.1312	0.1304
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1049	0.1042
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0793	0.0786	0.0781
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

ESTIMATING PERCENTAGE OF PWL

TABLE 1. TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)								
Percent Within Limits (P _L and P _U)	Negative Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1049	-0.1042
45	-0.1806	-0.1500	-0.1406	-0.1363	-0.1338	-0.1322	-0.1312	-0.1304
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2093
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4355	-0.4310	-0.4280	-0.4257
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105
30	-0.6787	-0.6000	-0.5719	-0.5582	-0.5504	-0.5454	-0.5419	-0.5394
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282
26	-0.7904	-0.7200	-0.6921	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8245	-0.8214	-0.8192
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382

ESTIMATING PERCENTAGE OF PWL

TABLE 1. TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)

Percent Within Limits (P _L and P _U)	Negative Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4717	-1.4829	-1.4914
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5871	-1.6127	-1.6313	-1.6454
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6993	-1.7235	-1.7420
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8053	-1.8379	-1.8630
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362

END OF SECTION

SECTION 01505
TEMPORARY FACILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General temporary facilities:

1. Utilities and environmental systems.
2. Sanitary facilities.
3. Field office.
4. Storage sheds, buildings and lay-down areas.
5. General-purpose radios. ATCT radios are specified in Section 01640 - City-Furnished Products.
6. Fire protection.
7. Protection of the Work and property.
8. Interim cleaning.
9. Disposal of trash and debris.

B. Temporary facilities for exterior work:

1. Barricades.
2. Hazard lighting.
3. Access roads and parking.
4. Environmental controls.
5. Disposal of excavated material.
6. Control of erosion and water runoff.

C. Temporary facilities for interior work:

1. Barricades and enclosures, including those for accessways and exit ways.

TEMPORARY FACILITIES

2. Hazard lighting.
 3. Environmental controls.
 4. Existing electrical power, water, and HVAC are available at interior construction projects for Contractor's use at no charge by City Engineer.
- D. Provide temporary product handling facilities and construction aids, such as scaffolds, staging, ladders and stairs, protective railings, hoists, chutes and other facilities, as required for construction operations and to protect persons, property and products. Follow governing agency requirements for scope, type and location if not otherwise specified.
- E. Follow Section 01326 - Construction Sequencing for mobilization and demobilization requirements.
- F. Temporary facilities specified herein are minimum standards. Provide additional facilities as required for proper execution of the Work and to meet responsibilities for protection of persons and property.
- G. Properly install temporary facilities.
- H. Maintain in proper operating condition until use is no longer required or as otherwise approved.
- I. Modify and extend temporary facilities as required by Work progress.
- J. Restore existing facilities used temporarily, to specified or original condition following Section 01731 - Cutting and Patching.
- K. Provide weather protection and environmental controls as required to prevent damage to remaining Base Facility, the Work, and to other property.
- L. Follow regulatory agency requirements for required temporary facilities not specified herein.
- M. Where disposal of spoil and waste products, whether or not they are contaminated, is required under this or other Sections, make legal dispositions off site following governing authorities' requirements, unless on-site disposition is allowed under this or other Sections.

1.02 SUBMITTALS

- A. Follow Section 01340 - Shop Drawings, Product Data and Samples.
- B. Submit shop drawings and descriptive data showing:
 1. Enclosure and barricade construction.

2. Enclosure and barricade layout if different from that shown on Drawings, including for each stage if applicable.

1.03 GENERAL REQUIREMENTS FOR UTILITIES AND ENVIRONMENTAL SYSTEMS

- A. Make arrangements with utility service companies for temporary services.
- B. Follow rules and regulations of utility service companies or authorities having jurisdiction.
- C. Maintain utility service until Substantial Completion, including fuel, power, light, heat, and other utility services necessary for execution, completion, testing, and initial operation of the Work.
- D. Follow Section 01312 - Coordination and Meetings for advance notifications and approvals of shutdowns of existing services and systems.
- E. Water: Provide water for construction, at Contractor's sole cost and expense except as otherwise required below. Coordinate location and type of temporary water service with and obtain approval from City Engineer.
 1. For water obtained direct from water mains or fire hydrants, obtain permit or license from proper authorities, and install temporary meter if applicable.
 2. For water obtained downstream from Department of Aviation meter, City will provide water without cost for construction operations. Obtain approval of tap types, locations, and pipe routing. Provide valves and pipe as required.
 3. For drinking water for personnel, provide potable water in proper dispensing containers, except public drinking fountains close to interior construction projects are available as long as use by Contractor does not impede airport operations or increase airport maintenance.
- F. Electrical Power: Provide power for lighting, operation of Contractor's plant or tools, or other uses by Contractor, at Contractor's sole cost and expense, except as otherwise required below. Coordinate location and type of temporary power service with and obtain approval from City Engineer.
 1. For power obtained direct from electric mains, obtain permit or license from proper authorities, and install temporary meter if applicable.
 2. For power obtained downstream from Department of Aviation meter, City will provide power, without cost for construction operations, however, this shall be solely at the discretion of the City Engineer. Tap existing electrical panels and circuits at locations and ampacities approved by City Engineer. Obtain approval of tap types, locations, and conduit/wire routing. Provide switches as required.

TEMPORARY FACILITIES

3. Provide temporary power service or generators to power construction operations and to power existing facilities during main service shutdowns, and at locations where proper commercial power is not available.
- G. Lighting: Provide lighting in construction areas, or other areas used by Contractor, at Contractor's sole cost and expense, except as otherwise required below. Coordinate location and type of temporary light fixtures with and obtain approval from City Engineer.
1. Provide explosion-resistant fixtures in areas where fuel is stored, handled or dispensed.
 2. Minimum Lighting Level: 5-foot candles for open areas; 10-foot candles for exitways. Provide minimum of one 300W lamp per 20 square feet of work area.
- H. Heat and Ventilation: Provide temporary heat and ventilation as required for protection or completion of the Work and to control dust, odors and other environmental contaminants. Provide safe working conditions. Maintain enclosed work areas, including interior work areas, at minimum of 50 degrees F.

1.04 SANITARY FACILITIES

- A. Provide one portable self-contained chemical toilet/urinal for each 25 workers for exterior construction projects or construction areas not close to existing public restrooms. Place at reasonably secluded locations conveniently accessible to workers. Follow regulations of State and local departments of health.
- B. Enforce use of sanitary facilities.
- C. Supply and service temporary sanitary units at least twice per week. Legally dispose of waste off-site.

1.05 CONTRACTOR'S FIELD OFFICE (IF NEEDED)

- A. Furnish and maintain portable building(s) for Contractor's field office, located on-site as shown on Drawings or in a place approved by City Engineer. Include furnishings and equipment as required by Contractor for proper construction operations and with following minimums when used by City Engineer or Designer:
 1. Structurally sound foundation and superstructure.
 2. Completely weathertight with insulated roof and walls.
 3. Exterior finish acceptable to City Engineer.
 4. Slip-resistant entry ramp sloped 1:12 maximum, with handrail platform (5x5 feet) with mud scraper at door. Supplemental and railings and slip-resistant stairs as required. Follow requirements of Americans with Disabilities Act.

TEMPORARY FACILITIES

5. Interior finishes acceptable to City Engineer.
 6. Screened windows sufficient for light, view, and ventilation.
 7. Minimum Parking: 2 all weather hard surfaced parking spaces, all-weather paving, for use by City Engineer and Designer, connected to office by walkway.
- B. Minimum Services for Contractor's Field Office:
1. Interior lighting of 50 foot-candles at desktop height.
 2. Exterior light at entrance.
 3. Automatic HVAC to maintain 65 degrees F in winter, 70 degrees F in summer.
 4. Electric power service.
 5. Two telephone lines:
 - a. One for voice, with telephone instrument.
 - b. One for facsimile, with facsimile instrument.
 - c. For use by Contractor's personnel and others performing work or services. Pay for cost of local calls. Directly bill applicable parties for cost of long distance, without cost to the contract.
 6. Minimum one cellular telephone, in possession of Superintendent at all times.
 7. One digital pager per shift supervisor.
 8. Base station for general-purpose radios, if radios are used.
 9. Chilled drinking water.
 10. Conference table and chairs to accommodate 10 persons.
- C. Maintenance for Field Office:
1. Continuous maintenance of office, accessways, and services; clean not less than once per week;
 2. Provide soap, paper towels, cleansers, janitorial service and appurtenances;
 3. Immediately repair damage, leaks or defective service.
- 1.06 STORAGE SHED, BUILDINGS AND LAY-DOWN AREAS

- A. Store products neatly and orderly onsite, arranged to allow inspection, identification and inventory, at locations approved by City Engineer.
- B. When lack of or ill-timed environmental control systems could damage products, store in bonded off-site facilities approved by manufacturer, supplier or fabricator.
- C. Provide suitable and substantial storage sheds, rooms, covers, or other facilities, for storage of material subject to contamination or damage from other construction operations. Provide environmental control to maintain products within manufacturers' required limits, when required. Storage of materials not susceptible to weather damage may be on blocks off the ground.
- D. Do not overload Base Facility structure. Provide temporary shoring or bracing as required to prevent damage to structures.

1.07. GENERAL-PURPOSE RADIOS

- A. Provide proper FCC licenses for operators.

1.08 FIRE PROTECTION

- A. Follow fire protection and prevention requirements specified herein and those established by Federal, State, or local governmental agencies.
- B. Follow applicable provisions of NFPA Standard No. 241, Safeguarding Building Construction and Demolition Operations.
- C. Provide portable fire extinguishers, rated not less than 2A or 5B following NFPA Standard No. 10, Portable Fire Extinguishers, for field office and for every 3000 square feet of floor area of facilities under construction, located within 50 feet maximum from any point in the protection area.
- D. Prohibit smoking in hazardous areas. Post suitable warning signs in areas which are continuously or intermittently hazardous.
- E. Use metal safety containers for storage and handling of flammable and combustible liquids.
- F. Do not store flammable or combustible products inside occupied buildings or near stairways or exits.
- G. Maintain clear exits from all points in the Work.

1.09 PROTECTION OF THE WORK AND PROPERTY

- A. Take precautions, provide programs, and take actions necessary to protect the Work and public and private property from damage.
- B. Prevent damage to existing public and private utilities and systems during construction. Utilities are shown on Drawings at approximate locations, but this information is not warranted as complete or accurate. Give City Engineer at least 48 hours notice before commencing work in the area, for locating the utilities during construction, and for making adjustments or relocation of the utilities when they conflict the Work.
 - 1. Utilize the Utility Coordinating Committee One Call System, telephone number, (713) 223-4567, called 48 hours in advance. The toll-free telephone number is 1-800-245-4545, Texas One Call System.
 - 2. Follow Section 01726 - Base Facility Survey, to determine existing utilities and systems.
 - 3. Follow Section 01761 - Protection of Existing Services, to make coordination efforts for each existing Service that requires protection.
- C. Provide safe barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, accessways, and hazardous areas.
- D. Obtain written consent from proper parties, before entering or occupying with workers, tools, or products on privately-owned land, except on easements required by the Contract Documents.
- E. Assume full responsibility for preservation of public and private property on or adjacent to the site. If direct or indirect damage is done by or on account of any act, omission, neglect, or misconduct in execution of the Work by Contractor, restore by Contractor, at no cost or time increase, to a condition equivalent to or better than that existing before the damage was done.
- F. Where work is performed on or adjacent to roadways, rights-of-way, or public places, provide barricades, fences, lights, warning signs, and danger signals sufficient to prevent vehicles from being driven on or into Work under construction.
 - 1. Paint barricades to be visible from sunset to sunrise
 - 2. Install at least one flashing hazard light at each barricade section.
 - 3. Furnish watchmen in sufficient numbers to protect the Work.
 - 4. Other measures for protection of persons or property and protection of the Work.
- G. Protect existing trees, shrubs, and plants on or adjacent to the site against unnecessary cutting, breaking or skinning of branches, bark, or roots.

1. Do not store products or park vehicles within drip lines.
 2. Install temporary fences or barricades in areas subject to damage from traffic.
 3. Water trees and plants to maintain their health during construction operations.
 4. Cover exposed roots with burlap and keep continuously wet. Cover exposed roots with earth as soon as possible. Protect root systems from physical damage and damage by erosion, flooding, run-off, or noxious materials contamination.
 5. Repair branches or trunks if damaged, prune branches immediately and protect the cut or damaged areas with emulsified asphalt compounded specifically for horticultural use in a manner approved by City Engineer.
 6. Remove and replace damaged trees and plants that die or suffer permanent injury. Replace with product of equivalent size and in good health.
 7. Coordinate this work with Division 2 requirements for clearing and landscaping.
- H. Protection of Existing Structures:
1. Fully sustain and support in place and protect from direct or indirect injury underground and surface structures located within or adjacent to the limits of the Work.
 - a. Before proceeding with sustaining and supporting work on property of others, satisfy City Engineer that the owner of the property approves the methods and procedures proposed.
 2. Do not move or in any way change the property of public utilities or private service corporations without prior written consent of a responsible official of that service or public utility. Representatives of these utilities reserve the right to enter within the limits of the Work for the purpose of maintaining their properties, or of making changes or repairs to their property considered necessary by performance of the Work.
 - a. Notify the owners and/or operators of utilities and pipelines of the nature of construction operations proposed and the date or dates on which those operations will be performed. When construction operations are required in the immediate vicinity of existing structures, pipelines, or utilities, give minimum 5 working days advance notice. Probe and securely flag locations of underground utilities prior to beginning excavation.
 3. Assume all risks attending presence or proximity of existing construction within or adjacent to the limits to the Work including but not limited to damage and expense for direct or indirect injury caused by the Work to existing construction. Immediately repair damage caused, following Section 01731.

- I. Protect installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed.
 - 1. Control traffic to prevent damage to products and surfaces.
 - 2. Provide coverings to protect products from damage. Cover projections, wall corners, jambs, sills, and off-site of openings in areas used for traffic and for passage of product in subsequent work.

1.10 ACCESS ROADS AND PARKING

- A. Follow Section 01575 - Stabilized Construction Exit for construction exits.
- B. Provide temporary stable construction roads, walks, and parking areas of a load bearing capacity required during construction connecting to public thoroughfares and for use of emergency vehicles. Design and maintain temporary roads and parking areas for full use in all weather conditions.
 - 1. Locate temporary roads and parking areas as approved by City Engineer.
 - 2. Prevent interference with traffic, City and airport operations on existing roads. Indemnify and save harmless the City from expense caused by Contractor's operations over these roads.
 - 3. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking. If not shown on the Drawings, locate as directed by City Engineer.
 - 4. Minimize use of construction traffic on existing on-site streets and driveways. For tracked vehicles, use street plugs. Do not load paving beyond design capacity.
 - 5. Do not allow heavy vehicles or construction equipment in existing parking areas.
- C. Public, Temporary, and Construction Roads and Ramps:
 - 1. Public Roads: Follow laws and regulations of governing authorities when using public roads. If Contractor's work requires public roads be temporarily impeded or closed, obtain approvals from governing authorities and pay for permits before starting work. Coordinate activities with City Engineer following Section 01312 - Coordination and Meetings.
 - 2. On-Site Roads: Prepare temporary roads, construction roads, ramps, and areas on the site to be accessible for trucking and equipment.
 - 3. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage. Extend and relocate as approved by City Engineer as Work progress requires,

provide detours as necessary for unimpeded traffic flow. Maintain 12-foot width access road with turning space between and around combustible materials. Provide and maintain access for fire trucks to fire hydrants free of obstructions.

- a. Do not use limestone for paving.
 4. Obtain approval of special requirements covering handling exceptionally large or heavy trucks, cranes, or other heavy equipment. Provide mats or other means, so roadways are not overloaded or otherwise damaged.
- D. Submit access road and parking locations to City Engineer for approval.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide products for temporary construction using equivalent type as required for permanent construction, except "construction grade" quality may be used (such as for wood framing, enclosures and barricades, and construction locks).
- B. Where materials for use in this Section are not specified or detailed, propose products in writing and obtain approval from City Engineer before commencing work.

2.02 TEMPORARY EXTERIOR ENCLOSURES AND BARRICADES

- A. Repair damaged existing barricades following Paragraph B. Reuse existing to maximum practical extent. Match new work to existing sightlines, profiles, and color.
- B. Provide temporary fencing as required to enclose exterior storage/staging and demolition areas, during on-site operations, chain link fence at remote areas (away from Terminal buildings), and chain link fence with plywood overlay at on-site areas (adjacent to or near Terminal buildings and AOA).

1. Chain Link: Minimum 6-foot high commercial quality galvanized fabric, galvanized steel or minimum 4 x 4 treated wood posts at 8 feet on center maximum, gate frames as required, with barbed wire at top if required by Contractor. For natural earth areas, provided minimum 8-inch diameter by 3-foot deep hole for posts. Fill annular space with pea gravel or crushed stone. For paved areas, provide welded base plate on each post and attach to paving with drill-in or powder actuated fasteners of size and quantity required to resist imposed loads. Provide corner bracing and struts as required to maintain erect fencing and taut fabric. Provide gate locks of Contractor's choice. Provide one set of keys to City Engineer.
2. Plywood Overlay: Exterior grade, minimum 3/4 inch-thick, 8-foot-high. Tie plywood with wire to public side of chain link fence and gates. Paint exterior (public) face with flat latex-based paint to match "Nevamar Pepperdust" plastic laminate.

TEMPORARY FACILITIES

- C. Barricades in Safety Areas of Taxiways and Aprons at AOA: Preservative-treated wood construction, maximum 3 feet high sawhorse legs at both ends of one 8-inch-high top rail, with 45 degree-angled white and orange hashmarks, on 4 by 4-inch wood posts and struts bolted to 12 by 12-inch continuous timber base. Install hazard lights at maximum 6 feet centers and at each end and corners of the barricade. Sandbag wood frame to prevent overturning by jet blast or prop wash.

2.03 TEMPORARY INTERIOR ENCLOSURES AND BARRICADES

- A. Provide temporary partitions and ceilings or reuse existing partitions as required to separate work areas during on-site finishing operations, to prevent penetration of dust, odors, gases and moisture into occupied areas and to prevent damage to remaining Base Facility and to Contractor's work. Remove new and existing barricades upon completion of work or as directed by City.
- B. Rigid Barricades and Enclosures: Provide wood or metal framing and gypsum board or plywood sheet materials with closed joints; flame spread rating of 25 or less following ASTM E84.
 - 1. Paint faces exposed to public areas to match "Nevamar Pepperdust" plastic laminate, as required by City Engineer.
 - 2. Sandbag or foam-tape floor track to existing terrazzo or tile flooring. Do not fasten to existing finished walls or ceiling tiles.
- C. Membrane Enclosures: Provide same framing as above. Cover with minimum 12 mil black plastic sheet, with taped joints and edges. Seal punctures as they occur.
- D. Perimeter Tape: Manufactured plastic tape, with printed "Construction Area" or equivalent message. Fasten to saw horses, "trees" or equivalent moveable posts. Repair breaks as they occur. Install around areas where quick changeability of barrier limits is required.

2.04 HAZARD LIGHTS

- A. Provide battery-powered flashing yellow lights on barricades and enclosures around perimeter of exterior areas adjacent to AOA, roadways, and parking aisles or spaces. Install on posts set in striped barrels and anchored with sand, or attach to fencing, as applicable and as ground space permits where barricades or enclosures do not occur.

2.05 TEMPORARY UTILITY AND ENVIRONMENTAL SYSTEMS WORK

- A. Furnish temporary HVAC, plumbing and electrical products as required to provide continued Base Facility operation, including systems by-pass dampers, ductwork, valves, pipe and fittings, conduit, wiring, junction boxes, and other items.

- B. Coordinate these products with products of Sections 01731 - Cutting and Patching and Divisions 2, 15 and 16.

PART 3 EXECUTION

3.01 CONTRACTOR'S FIELD OFFICE

- A. Install field office ready for occupancy, 10 days after date fixed in Notice to Proceed.

3.02 ENCLOSURE AND BARRICADE, SIGN, AND HAZARD LIGHT INSTALLATION

- A. Fill and grade site for temporary structures to provide drainage away from buildings. Follow Section 01506- Temporary Controls and 01572 - Erosion and Sedimentation Control for erosion and sedimentation control.
- B. Follow Section 01507 - Temporary Signs.
- C. Install and maintain enclosures and barricades, passageways, signs and lights at locations shown on Drawings, or as directed by City Engineer, or as required to safely divert unauthorized parties away from or around construction operations.
 - 1. Maintain minimum 3-foot candles of illumination at exitways, including those remaining adjacent to permanent barricades.
 - 2. Reinforce barricades at AOA as required to withstand jet blast loads.

3.03 TEMPORARY UTILITY AND ENVIRONMENTAL SYSTEMS

- A. Install temporary HVAC, plumbing and electrical products as required to maintain adequate environmental conditions to facilitate progress of Work, to meet specified minimum conditions for installation of materials, to protect materials and finishes from damage due to temperature or humidity beyond specified or otherwise required ranges, and to maintain proper Base Facility systems operation outside contract limits.
- B. Provide ventilation of enclosed areas for proper curing of installed products, to disperse or control humidity, and to prevent hazardous accumulations of dust, fumes, vapors or gases inside or outside of enclosures.

3.04 REMOVAL OF TEMPORARY FACILITIES

- A. Maintain temporary facilities until Substantial Completion inspection, or when use is no longer required, or as directed by City Engineer.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Restore existing facilities used during construction to specified or original condition following Section 01731 - Cutting and Patching.

TEMPORARY FACILITIES

3.05 DISPOSAL OF DEBRIS , EXCESS PRODUCTS AND EXCAVATED MATERIAL

- A. Legally dispose of waste and excess products off site. Do not burn or bury on site.
 - 1. Prepare and file with Texas Department of Health (TDH) “TDH Demolition/ Renovation Notification” related to compliance with National Emissions Standards for Hazardous Air Pollutants. Obtain form from TDH, 10500 Forum Place Drive, Suite 300, Houston, TX 77036-8599, (713) 414-6125, or (800) 572-5548.
- B. Dispose of excavated material off site. Do not make disposition within the City in an area designated as being within the 100-Year Flood Hazard Area unless a “Special Development Permit” as defined by City Ordinance No. 81-914 and Number 85-1705 has been issued. Verify the floodplain status of proposed disposal site.
 - 1. For floodplain information, contact the City of Houston Storm Sewer Engineering Section at (713) 837-0989.
 - 2. Immediately remove and properly dispose of excavated material placed in the 100-Year Flood Hazard Area without a ‘Special Development Permit’ at no cost or time increase to the contract.
- C. Do not dispose of debris in sewers. Repair sewer lines to proper function within contract limits as a result of permitted use.
- D. Remove and legally dispose of excess and other products not designated for salvage.

3.06 INTERIM CLEANING

- A. Temporarily store debris in areas concealed from public, occupants’ and AOA view. Prevent migration of debris and dust following Section 01506 - Temporary Controls.
- B. Clean-up dirt and debris in vicinity of construction entrances each day. Clean up debris, scrap materials, and other disposable items before completion of each day's work. Keep streets, driveways, and sidewalks clean of dirt, debris and scrap materials.
 - 1. Failure to maintain clean site is the basis for City Engineer take action following Section 2.5 in Document 00700 - General Conditions.
- C. Remove debris daily unless otherwise approved by City Engineer.
- D. Prevent hazardous conditions due to product or debris storage in work areas and storage areas.
- E. Keep streets used for entering or leaving the job area free of excavated material, debris, and foreign material, including carryout dust and mud, resulting from construction operations.

Follow Section 01575 - Stabilized Construction Exit for vehicle wash areas. Follow City of Houston Ordinance No. 5705, Construction or Demolishing Privileges.

- F. As frequently as necessary, sweep and damp mop floors of spaces in public spaces adjoining access points through barricades or enclosures.

END OF SECTION

SECTION 01506
AIRPORT TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Dust control.
- B. Noise control.
- C. Pest and rodent control.
- D. Pollution and environmental control.
- E. Security controls, security plan and procedures. Work in AOA or the airport's secured area is not intended as part of this Contract; however, TSA may be involved in reviews of Contractor's construction plans to verify no TSA requirements or restrictions apply.
- F. Safety requirements and safety plan.
- G. Emergency procedures.

1.02 REFERENCES

- A. U.S. Department of Transportation Federal Aviation Administration Advisory Circular AC 150/5370-2C.

1.03 SUBMITTALS

- A. Make following submittals in 3-ring "D" binders, with clear spine and cover pockets and label "Airport Construction Control Plans" on white card-stock inserts. Prepare submittals as work of this and other Sections but submit following Section 01312 - Coordination and Meetings.
- B. Preliminary "Airport Construction Control Plans": Submit, under provisions of Section 01325, 3 copies in draft form of the following, with section dividers labeled as and containing:
 - 1. Construction Traffic Control Plan prepared under Section 01555 - Traffic Control and Regulation.

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2. Emergency Response Plan Listing Safety Officers (Paragraph 1.09) with names, positions, office and home telephone numbers, and pager and portable telephone numbers.
 3. Safety Plan, including Trench Safety Plan prepared under Section 01561 - Trench Safety System.
 4. Security Plan.
 5. Dust Control Plan.
 6. Ground Water and Surface Water Control Plan prepared under Section 01578 - Control of Ground and Surface Water.
 7. Revise as required and submit 5 final copies, in same form as preliminary copies under Section 01312 - Coordination and Meetings.
- C. Pesticides and Poisons: Submit following Section 01340 - Shop Drawings, Product Data and Samples. Include Material Safety Data Sheets and manufacturers' recommendations for use and application. Include copy of applicator's certification from manufacturer.
- 1.04 DUST CONTROL
- A. Prevent uncontrolled dust creation and movement. Prevent airborne particulates from reaching receiving streams or storm water conveyance systems, building interiors and AOA.
 - B. Use spray-on adhesives or plastic covers on exposed soil piles.
 - C. Follow Section 01505 - Temporary Facilities for interior enclosures.
 - D. Implement dust control methods immediately whenever dust migration is observed.
- 1.05 NOISE CONTROL
- A. Provide vehicles and tools with noise suppressors and use methods and products that minimize noise to the greatest degree practicable. Follow OSHA standards and City Ordinances regarding noise. Do not create noise levels which interfere with the Work, with work by City, with airport operations, or which create a nuisance in surrounding areas.
 - B. Do not use impact-type or powder-actuated-type tools adjacent to occupied office-type areas.
- 1.06 PEST AND RODENT CONTROL
- A. Provide pest and rodent control as required to prevent infestation of construction or storage areas using legal chemicals applied by a licensed applicator.

- B. Provide methods and products with no adverse effect on the Work or adjoining properties.
- C. Use and store chemicals following manufacturers' recommendations and with local, state, and federal regulations. Avoid overuse of pesticides that produce contaminated runoff. Prevent spillage. Do not wash pesticide containers in or near flowing streams or storm water conveyance systems, or inside buildings.

1.07 POLLUTION AND ENVIRONMENTAL CONTROL

- A. Prevent contamination of soil, water or atmosphere by discharge of noxious substances from construction operations.
- B. Contain spillage and remove contaminated soils or liquids. Excavate and dispose of contaminated earth off-site and replace with suitable compacted fill and topsoil.
- C. Prevent harmful substances from entering public waters. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.
- D. Provide systems for control of atmospheric pollutants. Prevent toxic concentrations of chemicals. Prevent harmful dispersal of pollutants into the atmosphere.
- E. Use equipment during construction following Federal, State, and local laws and regulations.
- F. Follow statutes, regulations, and ordinances governing prevention of environmental pollution and preservation of natural resources, including but not limited to the National Environmental Policy Act of 1969, PL 91-190, Executive Order 11514.
- G. Undeveloped areas on the airport site have considerable natural value. Do not cause unnecessary excavation or filling of terrain, unauthorized destruction of vegetation, air or stream pollution, nor harassment or destruction of wildlife.
- H. Follow environmental requirements. Limit disturbed areas to boundaries established by the Contract Documents. Do not pollute on-site streams, sewers, wells, or other water sources.

1.08 SECURITY CONTROLS, PLAN AND PROCEDURES

- A. Protect products and property from loss, theft, damage, and vandalism. Protect City property and other private property from injury or loss in connection with the Work.
- B. Employ watchmen as needed to provide required security and prevent unauthorized entry.
- C. Repair damage or replace property vandalized.

- D. If existing fencing or barriers are breached or removed for purposes of construction, provide an appropriate (as determined by the airport manager or designee) number of guards and/or maintain temporary security fencing equivalent to existing and approved by City Engineer.
- E. Maintain security program through construction until City's acceptance and occupancy precludes need for Contractor's security program.
- F. Provide chain link fence Terminal area staging areas, following Section 01505 - Temporary Facilities.
- G. Airport Security Requirements:
 - 1. Airport Manager and TSA monitor effectiveness of airport security by attempting to gain unauthorized entry into security areas. When TSA gains unchallenged access to security areas, City and/or the responsible individual may be fined. When unauthorized entry into security areas is made through contract limits or other areas under the Contractor's control:
 - a. Reimburse the City, without increase in contract price, the amount of imposed fines levied against the City, accomplished by Change Order following Section 01255 - Modification Procedures.
 - b. Cease work in breached areas until proper security measures are in place, without change in contract price or time.
 - 2. Immediately notify HPD of discovered presence of unbadged or unknown persons, vehicles or animals in security areas. Dial (IAH) (281) 231-3100.
 - 3. Obtain permitted AOA gate and other security area access locations from Airport Manager. Assign personnel to control passage through entry points not staffed by airport personnel.
 - 4. Badges:
 - a. *After contract award and before preparation of the Safety Plan (Paragraph 1.09D) and construction schedule (Section 01325), obtain permitted security badges.*
 - b. *Security identification badges are required for access into AOA/Secured areas. Badges are valid for one year or for the period of the contract, whichever is shorter.*
 - c. *TSA TSR Part 1542.209 applies to personnel engaged in work of this contract occurring within the AOA or secured area, and reads in part as follows:*

"...each airport operator must ensure that no individual is granted unescorted access authority unless the individual has undergone a fingerprint-based criminal history records check (CHRC) that does not disclose that he or she has a disqualifying criminal offense."

- d. Obtain from City Engineer and fill out one security badge application package (application form and all associated paperwork) per person (including subcontractors' personnel) needing unescorted access in security areas.*
- e. Contact the airport ID badging office to arrange for collection and submittal of fingerprints. Prepare and maintain a file for each applicant, including a copy of the completed application. Keep in Contractor's main office until expiration of the warranty period.*
 - (1) Short-term or temporary personnel are permitted in security areas but only under constant escort by a properly badged escort, who shall have no duty other than to escort short-term or temporary personnel.*
 - (2) Badged and escorted personnel are limited to access to and from work areas and shall remain in the work area.*
 - (3) Personnel under constant escort shall be continuously observed by and in the immediate company of badged personnel.*
 - (4) City Engineer may limit the number of badged personnel and personnel under constant escort.*
- f. Submit completed applications to City Engineer for further review.
- g. Attend required security training sessions.
- h. Pick up completed badges and pay badging fees (as of November 2019, \$55.00 per badge for a 1-year period--verify fee and duration with Airport Manager).
- 5. Do not leave fence breaks unattended. Restore fence or erect equivalent secure temporary fencing before departing the work area.
- 6. Provide proper identification on Contractor's vehicles permitted in AOA.

1.09 SAFETY REQUIREMENTS

- A. Contractor and not City, City Engineer or Designer is solely and without qualification responsible for observation and compliance with safety regulations without reliance or superintendence of or direction by City, City Engineer or Designer.
- B. Safety measures, including but not limited to safety of personnel, provision of first-aid equipment, installation, operation and removal of temporary ventilation and safety

AIRPORT TEMPORARY CONTROLS

equipment, in the Contract Documents are a subsidiary obligation of Contractor compensated through various payment items.

- C. Follow Document 00700 - General Conditions Paragraph 10.1 and this Section for safety plan and procedures.
- D. Prepare a written detailed Safety Plan for the Work describing:
 - 1. Specific methods used to maintain airport safety procedures, based on requirements of the Contract Documents, airport procedures, FAA/TSA requirements and Contractor's own safety and security program.
 - 2. Contractor's emergency procedures in event of following minimum set of circumstances: airport's-, tenants'- or Contractor's on-site property damage; accidents; fire emergency; medical emergency; Airport Manager's intervention in construction operations; detainment or arrest of unauthorized Contractor's employees and subcontractors in Security areas; discovery of hazardous materials.
 - 3. Provisions for temporary removal of security fencing (including culvert and drain-way grates). Include proposed actions to prevent entry of people or animals into security areas when security fence is breached. Do not breach fencing without approval.
 - 4. Requirements for closing safety areas.
 - 5. Submit draft Safety Plan at the Preconstruction Conference, following Section 01312 - Coordination and Meetings.
- E. City Engineer will review the safety program with FAA and ATCT for compliance with applicable regulations. If the plan fails to demonstrate compliance, modify it until approval is obtained.
- F. Contractor's Safety Officers: Refer to Section 01550 - Public Safety & Contractor Safety Staffing, Paragraph 1.05, Contractor's Safety Staffing Requirements.
- G. Submit final Safety Plan at the first Progress Meeting following Section 01312 - Coordination and Meetings.
 - 1. Include in the safety plan Contractor's response to trench safety requirements following Section 01561 - Trench Safety System.
- H. Follow applicable Federal, State and local safety codes and statutes and with proper construction practice. Establish and maintain procedures for safety of work, personnel and products involved in the Work.
- I. Follow Texas Occupational Safety Act (Art. 5182a, V.C.S.) and promulgations of Secretary of Labor under Section 107 of Contract Work Hours and Standards Act, published in 29 CFR Part 1926 and adopted by Secretary of Labor as occupational safety

and health standards under the Williams-Steiger Occupational Safety and Health Act of 1970. Follow other legislation enacted for safety and health of Contractor employees. These safety and health standards apply to Contractor, Subcontractors and Suppliers and their respective employees.

- J. Immediately notify City Engineer of investigation or inspection by Federal Safety and Health inspectors of the Work or place of work on the job site, and after such investigation or inspection inform City Engineer of results. Submit 1 copy of accident reports to City Engineer within 10 days of date of inspection.
- K. Protect areas occupied by workmen by the best available devices for detection of lethal and combustible gases. Frequently test devices to assure their functional capability. Monitor liquids and gases infiltrating into work areas for visual or odor evidences of contamination. Take immediate appropriate steps to seal off entry of contaminants into to the Work.
- L. Maintain coordination with City's Police and Fire Departments during the Work.

1.10 EMERGENCY PROCEDURES

- A. If an emergency situation occurs, including involvement in or witness to aircraft or motor vehicle emergencies and emergencies involving other parties or property regardless of fault, or a violation of requirements of this Section, or a violation of FAA/TSA regulations, take one or more of the following minimum actions as appropriate to the situation.
- B. Immediately report to City Engineer accident or damage to pavement, buildings, utilities, and vehicles involving or caused by Contractor, Subcontractors, Suppliers, personnel, equipment or others.
- C. In general:
 - 1. Immediately notify HFD or HPD (public areas) as appropriate and applicable to location of emergency.
 - 2. Notify City Engineer by telephone or in person.
 - 3. Stop work in the area. Secure site as required to prevent further damage to property and persons.
 - 4. Evacuate non-essential personnel from the scene. Keep involved personnel and witnesses on-site until otherwise directed by City Engineer or security officers.
 - 5. Impound involved vehicles in "as-is condition" until otherwise directed.
 - 6. Do not resume work in the area until released by City Engineer.

- D. For discovery of actual or suspected hazardous material contamination, proceed with Paragraph B above while simultaneously initiating Contractor's own hazardous material response program.
- E. Follow City Engineer's instructions for emergencies affecting the Work but occurring outside the Contract Limits. Certain situations may require the Work or work to be temporarily stopped under provisions of Document 00700 - General Conditions.
 - 1. Maintain a log documenting cost and time impact of the stop-work order.
 - 2. Submit data to the City Engineer in form as instructed at that time.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01507
TEMPORARY SIGNS

PART 1- GENERAL

1.01 SECTION INCLUDES

- A. Temporary signs at construction access points.
- B. Maintenance.
- C. Removal.
- D. Project and Contractor identity signs are not permitted.

1.02 QUALITY ASSURANCE

- A. Design signs and supporting sign structure to remain in place and withstand 50 miles-per-hour wind velocity.
- B. Sign Manufacturer/Maker/Painter: Experienced professional sign company.
- C. Finishes, Painting: Withstand weathering, fading, and chipping for duration of construction.
- D. Appearance: Fresh, new-looking, legible and neat look during the entire period during which required.

1.03 SUBMITTALS

- A. Follow Section 01340 - Shop Drawings, Product Data and Samples.
- B. Submit shop drawings including:
 - 1. Signboards and Copy: Show to-scale size, dimensions, content, layout, font style and size, and colors.
 - 2. Location of each sign during each stage (Section 01326 - Construction Sequencing).

PART 2 PRODUCTS

2.01 TEMPORARY SIGNS FOR ACCESS POINTS

- A. Posts for Exterior Signs: New 4x4 inch moisture-resistant-treated wood or 2-1/2-inch diameter by 12-foot long galvanized steel.

TEMPORARY SIGNS

1. Unpainted.
 2. Fabricate to length required for 3-foot direct-bury plus aboveground length required for proper height of signboard mounting.
 3. Furnish number of posts as required for proper support of signboard
- B. Signboards:
1. For Exterior Signs: 3/4-inch-thick exterior grade medium density overlay (MDO) plywood, or 3/16-inch sheet aluminum. Paint background black.
 - a. Contractor's Option: Use colored vinyl film in lieu of paint for aluminum.
 2. For Interior Signs: 3/4-inch-thick fire-retardant treated medium density overlay plywood, or colored plastic laminate cladding both faces and with painted edges, or 1/8-inch sheet aluminum. Paint background black.
 - a. Contractor's Option: Use colored vinyl film in lieu of paint for aluminum.
- C. Color Coating for Signboards and Hashmarks: Flat ultraviolet inhibited acrylic polyurethane or matte vinyl, all visible surfaces.
- D. Copy and Borders: Flat color (color as scheduled) vinyl die-cut, Helvetica Medium typeface, size as shown or scheduled.
- E. Rough Hardware: [For wood, galvanized steel or brass for fasteners and other hardware] [For aluminum, cadmium-plated steel or stainless steel].
- F. Skid-mounted Signs: Allowed only when approved by the City Engineer. Approval does not release Contractor from responsibility of maintaining temporary signs on site and does not make City responsible for security of temporary signs.

2.03 SIGN FABRICATION

- A. Fabricate signboards and install copy in the shop.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install temporary signs at construction area access points, including within security areas and AOA, at following location:
 1. As scheduled below.
 2. Where shown on Drawings.

TEMPORARY SIGNS

3. Where required by City Engineer.

B. Install signs fully visible, legible, level and plumb.

3.02 MAINTENANCE

A. Maintain signs and supports and markings clean. Repair deterioration and damage.

B. Relocate signs as work progresses at both at no additional cost to the City.

3.03 REMOVAL

A. Remove temporary sign work when control is no longer needed or as directed by City Engineer.

3.04 MESSAGE SCHEDULE

A. Construction Entrance Warning Sign: 3 by 2-foot signboard, white copy and border on black background. Surface-mount on access gates through fences and on doors through barricades or enclosures; at 50 feet on center unless otherwise required by governing agencies:

NO ENTRANCE (4 inch)

CONSTRUCTION AREA (4 inch)

(45-degree hash marks, full width) (2 inch)

Hard Hat Required (2 inch)

B. Emergency Egress Sign: One-foot square signboard, white copy and border, with directional arrow, on black background. Surface-mount on fences, barricades or enclosures, or freestanding, spaced 50 feet on center along path of egress, unless otherwise required by governing agencies.

EXIT (4 inch)

(Arrow direction as appropriate to egress path) (6 inch)

C. No Entrance to Closed Parking Area: 8 by 4-foot signboard, white copy and border on black background, free-standing; at each ramp access to floor on which work occurs:

NO ENTRANCE (6 inch)

CONSTRUCTION AREA (6 inch)

TEMPORARY SIGNS

(45-degree hash marks, full width (4 inch)

This Parking Area Closed (4 inch)

Until **(TBD)** (4 inch)

END OF SECTION

SECTION 01550

PUBLIC SAFETY & CONTRACTOR'S SAFETY STAFFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Public Safety and Convenience
- B. General Requirements
- C. Street Markers and Traffic Control Signs
- D. Contractor's Safety Staffing Requirements

1.02 RELATED SECTIONS

- A. Section 00700 - General Conditions
- B. Section 01555 – Traffic Control & Regulations
- C. Section 01561 – Trench Safety System

1.03 PUBLIC SAFETY AND CONVENIENCE

- A. The Work in this Project is to be performed [edit wording for scope of work and coord. w/other const. Projects going on in the immediate area]. The Contractor shall furnish and maintain appropriate barricades and signage required to maintain a safe work environment for the HAS employees, the public and construction staff working at the project site.
- B. Contractor shall plan and execute his operations in a manner that will cause a minimum interference with other construction projects.
- C. Signs, barricades and warning devices informing public of construction features will be placed and maintained by Contractor, who shall be solely responsible for their maintenance.
- D. Contractor shall perform the necessary cleanup and finishing immediately after all or a portion of the Work is completed.
- E. All fire hydrants and water control valves shall be kept free from obstruction and available for use at all times.

PUBLIC SAFETY & CONTRACTOR SAFETY STAFFING

1.04 GENERAL REQUIREMENTS

- A. The Contractor shall observe the rules and regulations of the State of Texas and agencies of the U.S. Government which prohibit the pollution of any lake, stream, river, or wetland by dumping of any refuse, rubbish, dredge material, or debris therein.
- B. The Contractor is specifically cautioned that disposal of materials into any water of the State must conform to the requirements of the Texas Natural Resource Conservation Commission (TNRCC), and any applicable permit from the US Army Corps of Engineers.
- C. Waste material must be disposed of at sites approved by the Owner's Representative and permitted by the City.

1.05 CONTRACTOR'S SAFETY STAFFING REQUIREMENTS

- A. Refer to Section 00700 – General Conditions, Article 10 – Safety Precautions

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF DOCUMENT

SECTION 01555

TRAFFIC CONTROL AND REGULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Signs, signals, lights and control devices.
- B. Flagmen.
- C. Construction parking control.
- D. Designated haul routes.
- E. Construction Traffic Control Plan.
- F. See also Section 01145 - Use of Premises.

1.02 DEFINITIONS

- A. See Section 01312 - Coordination and Meetings for definition of terms related to Aircraft Operations Area (AOA).
- B. Flagman: A person who has successfully fulfilled the “Certified Flagman” requirements set forth by the Texas Department of Transportation. Flagman certification may be achieved either through the Texas Department of Transportation, Texas Engineering Extension Services (TEEX), the City of Houston’s E.B Cape Training Center, or by a trained and certified flagman instructor, employed by the Contractor. The certified flagman must carry proof of certification while performing flagman duties. The certified flagman will be required to wear a distinctive, bright colored vest and be equipped with appropriate flagging and communication devices. He/she must be fluent in English (speaking, reading, writing), with Spanish an advantageous, but not required, primary or secondary language.
- C. Peace Officer: A licensed police officer actively employed in a full-time capacity as a peace officer, working on average, minimum 32 paid hours per week, at a rate not less than the prevailing minimum rate following the Federal Wage and Hour Act, and entitled to full benefits as a peace officer, and who receives compensation for private employment as an individual employee or independent contractor. Private employment may be either in employee-employer relationship or on an individual contractual basis. He/she must be fluent in English (speaking, reading, writing) with Spanish an advantageous, but not required, primary or secondary language.

TRAFFIC CONTROL AND REGULATION

- D. Uniformed Flagman: A peace officer trained in traffic control and familiar with George Bush Intercontinental Airport roadway traffic patterns and airport operation procedures. A uniformed flagman may not be a reserve peace officer.

1.03 SUBMITTALS

- A. For Contractor-proposed changes to Traffic Control and Regulation shown on Drawings, permitted only in order to reduce construction time and cost through re-sequencing the Work, prepare plan drawings and supplement with product literature, narrative description, and construction schedule.

1.04 MEASUREMENT AND PAYMENT

- A. Traffic Control and Regulation, excluding Flagmen: Measurement is on a lump sum basis, including submittal of Contractor-proposed changes. Payment will be made based on schedule of values and percent of work complete.
- B. Flagmen: Measurement is on a lump sum basis as required for the Work. Payment will be made based on schedule of values and percent of work complete.
- C. Follow Section 01290 - Payment Procedures.

1.05 CONSTRUCTION TRAFFIC CONTROL PLAN AND PROCEDURES

- A. Develop a written and graphic detailed Construction Traffic Control plan describing:
 1. Rerouting of public roadway and AOA roadway traffic (outside safety areas) showing route, duration, and methods for change over from one route to the other and return to normal.
 2. Product Deliveries: Location, space required and duration for temporary off-loading along public roadways or curbsides and along AOA roadways and around buildings adjacent to aprons, and route through occupied building interiors.
 3. Barricade locations and duration of installation. Submit barricade construction details following Section 01505 - Temporary Facilities.
 4. Maintain, update and obtain approval for changes.

PART 2 PRODUCTS

2.01 SIGNS, SIGNALS, AND DEVICES

- A. Furnish traffic cones, drums, barricades and traffic intersection lights, including control devices in AOA, following TMUTCD.

2.02 FLAGMEN AND OTHER PERSONNEL

TRAFFIC CONTROL AND REGULATION

- A. Provide certified flagmen in number, at assigned, locations, and for durations as required to regulate even flow of vehicular and pedestrian traffic affected by construction activities.
- B. Employ other personnel, i.e. uniformed peace officers, to take the additional steps required to protect the Work and public, or when specifically requested by Airport Operations personnel through the City Engineer to assist flagmen in the regulating of airport roadway traffic. The uniformed peace officer will coordinate with City Engineer, contractor, and/or Airport Operations personnel, as appropriate, prior to beginning shift.
- C. Use of flagmen or peace officers does not reduce responsibility for damage for which the contractor would otherwise be liable.

PART 3 EXECUTION

3.01 GENERAL

- A. Install traffic control devices, including flagmen, at approaches to site and on site, at crossroads, detours, parking areas, at AOA, at construction entrances, and elsewhere as required to direct construction and affected public traffic, aircraft and GSE, or where directed by City Engineer and/or Airport operations personnel.
- B. As directed by appropriate authority, e.g., City Engineer, employ additional uniformed peace officers to supplement the flagmen when performing a total terminal area road closure, detour, or overnight activity that affects existing traffic patterns. The uniformed peace officer will coordinate with City Engineer, contractor, and/or Airport Operations personnel, as appropriate, prior to beginning shift.
- C. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.
- D. Install warning lights on traffic control devices for use during hours of low visibility to delineate traffic lanes and to guide traffic. Do not use flares or flame pots.
- E. Relocate traffic controls as Work progresses, to maintain effective traffic control.

3.02 HAUL ROUTES

- A. Confine construction traffic to designated haul routes.
- B. Regulate construction traffic along haul routes. Minimize interference with public traffic.
- C. Follow Texas State Highway and Public Transportation load limits of roadways.

3.03 PUBLIC ROADS AND TERMINAL AREA OADS

- A. Abide by laws and regulations of governing authorities when using roads.
- B. Maintain road lane use as follows, unless otherwise permitted by Airport Manager or Airport Operations personnel, as coordinated through City Engineer.
 - 1. All Terminal area road lanes available from 0500 to 2200 hours; minimum two lanes in each direction at all times.
 - 2. All on-airport road lanes (outside Terminal area) available from 0500 to 0900 hours, and from 0600 to 1900 hours; minimum two lanes in each direction at all times.
- C. Maintain access at driveways. Do not block any vehicle or pedestrian traffic area without obtaining prior approval from the Houston Airport. Any unusual or otherwise unforeseen activity will require forty-eight (48) hours of notification to the City Engineer as well as Airport Operations personnel. Traffic control meetings are held weekly, on Thursdays, at 2:00 pm at a location to be identified during the pre-construction conference. Contractor shall attend these meetings to coordinate all roadway traffic impacts. Contractor must present detailed traffic control/coordination plan, including drawings, written narrative, etc., with dates, times, and durations of proposed activities. This plan must be presented a minimum of three weeks prior to intended activity.
- D. Maintain roads on airport property clean at all times. Broom or wash as required. At Terminal area roads, follow behind haul vehicles and immediately clean up roads and debris and foreign material resulting from construction operations is deposited.
- E. Follow City of Houston Ordinance 5705, Construction or Demolishing Privileges

3.04 CONSTRUCTION PARKING CONTROL

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and airport operations.
- B. Prevent construction personnel's vehicles in revenue-producing facilities. Maintain vehicular access to and through construction parking areas.
- C. Do not park on or adjacent to roadways or curbsides.
- D. Comply with all security directives with regard to parking in the Terminal area

3.05 REMAINING EXISTING CONTROL AND REGULATION DEVICES

- A. Leave existing control and regulation devices in place and properly operating and visible during construction, unless indicated for removal or otherwise permitted.
- B. Repair damage resulting from construction operations.

3.06 REMOVAL OF EXISTING CONTROL AND REGULATION DEVICES

TRAFFIC CONTROL AND REGULATION

- A. Contact City of Houston Signal Shop Dispatcher at (713) 803-3004 before removing or deactivating existing control and regulation devices.
- B. Remove designated or permitted existing control and regulation devices following Section 01731.
- C. Unless otherwise indicated or directed, remove existing lane striping and reflective buttons in conflict with temporary control and regulation devices. Install matching temporary lane striping and reflective buttons, maintain during construction, remove after construction is complete, and install permanent matching lane striping and reflective buttons.

3.07 BRIDGING TRENCHES AND EXCAVATIONS IN ROADS

- A. Follow Section 01505 - Temporary Facilities.

3.08 REMOVAL OF TEMPORARY CONTROL AND REGULATION

- A. Remove controls and regulation when no longer required. Repair damage caused by installation.
- B. Remove post settings to a depth of 2-feet.

END OF SECTION

SECTION 01570

STORM WATER POLLUTION PREVENTION CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Implementation of Storm Water Pollution Prevention Plans (SWP3) described in Section 01410 – TPDES Requirement.
- B. Installation, maintenance and removal, of storm water pollution prevention structures: diversion dikes, interceptor dikes, diversion swales, interceptor swales, down spout extenders, pipe slope drains, paved flumes and level spreaders. Structures are used during construction and prior to final development of the site.
- C. Filter Fabric Barriers:
 - 1. Type 1: Temporary filter fabric barrier for erosion and sediment control in non-channelized flow areas.
 - 2. Type 2: Temporary reinforced filter fabric barrier for erosion and sediment control in channelized flow areas.
- D. Hay Bale Fence.
- E. Drop Inlet Basket Inlet
- F. Sediment Traps
- G. Brush Berm
- H. Sand Bag Barrier
- I. Bagged Gravel Barrier
- J. Sediment Basin Inlet
- K. Protection Barrier

1.02 MEASUREMENT AND PAYMENTS

- A. UNIT PRICES

STORM WATER POLLUTION PREVENTION CONTROL

1. Payment for filter fabric barrier is on a linear foot basis measured between limits of beginning and ending of stakes.
 2. Payment for reinforced filter fabric barrier is on a linear foot basis measured between limits of beginning and ending of stakes.
 3. Payment for drop inlet baskets is on a unit price basis for each drop inlet basket.
 4. Payment for storm inlet sediment traps is on a unit price basis for each storm inlet sediment trap.
 5. Payment for storm water pollution prevention structures is on a lump sum basis for the project. Earthen structures with outlet and piping include diversion dikes, interceptor dikes, diversion swales, interceptor swales, and excavated earth-outlet sediment trap, embankment earth-outlet sediment trap, down spout extenders, pipe slope drains, paved flumes, stone outlet sediment trap, and level spreaders.
 6. Payment for hay bale barrier, if included in Document 00410 - Bid Form, is on a linear foot of accepted bale barriers, if not include in cost of storm water pollution prevention structures.
 7. Payment for brush berm, if included in Document 00410 - Bid Form, is on a linear foot of accepted brush berm, if not include in cost of storm water pollution prevention structures.
 8. Payment for sandbag barrier, if included in Document 00410 - Bid Form, is on a linear foot basis measured between limits of beginning and ending of sandbags, if not include in cost of storm water pollution prevention structures.
 9. Payment for bagged gravel barrier, if included in Document 00410 - Bid Form, is on a linear foot basis measured between limits of beginning and ending of bagged gravel barrier, if not include in cost of storm water pollution prevention controls.
 10. Payment for inlet protection barriers, if included in Document 00410 -Bid Form, is on a linear foot basis measured along outside face of inlet protection barrier, if not include in cost of storm water pollution prevention structures.
 11. Refer to Section 01270 - Measurement and Payment for unit price procedures.
- B. Stipulated Price (Lump Sum) Contract. If Contract is Stipulated Price Contract, payment for Work in this Section is included in total Stipulated
- 1.03 REFERENCE
- A. STANDARD ASTM

STORM WATER POLLUTION PREVENTION CONTROL

1. A 36 – Standard Specification for Carbon Structural Steel.
 2. D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600kN-m/m³)).
 3. D3786 – Standard Test Method for Hydraulic Bursting Strength for knitted Goods and Nonwoven Fabrics.
 4. D 4355 - Standard Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
 5. D 4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 6. D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 7. D 4833 - Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
 8. D 6382 - Standard Practice for Dynamic Mechanical Analysis and Thermogravimetry of Roofing and Waterproofing Membrane Material.
- B. Storm Water Management Handbook for Construction Activities prepared by the City of Houston, Harris County and Harris County Flood District.

1.04 SYSTEM DESCRIPTIONS

- A. Filter Fabric Barrier Type 1 and Type 2: Install to allow surface or channel runoff percolation through fabric in sheet-flow manner and to retain and accumulate sediment. Maintain Filter Fabric Barriers to remain in proper position and configuration at all times.
- B. Hay Bale Fence: Install to allow surface runoff percolation through hay in sheet- flow manner and to retain and accumulate sediment. Maintain Hay Bale Fence to remain in proper position and configuration at all times.
- C. Interceptor Dikes and Swales: Construct to direct surface or channel runoff around the project area or runoff from project area into sediment traps.
- D. Drop Inlet Baskets: Install to allow runoff percolation through the basket and to retain and accumulate sediment. Clean accumulation of sediment to prevent clogging and backups.
- E. Sediment Traps: Construct to pool surface runoff from construction area to allow sediment to settle onto the bottom of trap.

- F. Sand Bags: Are used during construction activities in unstabilized minor swales, ditches, or streambeds when the contributing drainage area is no greater than 2 acres. It is also sediment barrier for stage one Inlet.
- G. Bagged Gravel Barrier: Are used during construction activities in unstabilized minor swales, ditches, or streambeds when the contributing drainage area is no greater than 2 acres. It is also sediment barrier for stage two Inlet.
- H. Drop Inlet Insert Basket: Is a temporary barrier placed within a storm drain inlet (Lower Portion of Stage I and Upper Portion of Stage II Inlets) consisting of a filter fabric supported by a metal frame work to prevent sediment and other pollutants from entering convey system.
- I. Brush Berm: Brush Berm is constructed at the perimeter of a distribute site within the developing area.

1.05 SUBMITTALS

- A. Conform to requirements of Section 01330 - Submittal Procedures.
- B. Submit manufacturer's literature for product specifications and installation instructions.
- C. Submit manufacturer's catalog sheets and other product data on geotextile or filter fabrics, outlet pipe, perforated riser and connectors.
- D. Submit proposed methods, equipment, materials, and sequence of operations for storm-water pollution prevention structures.
- E. Submit shop drawings for Drop Inlet Baskets.

PART 2 PRODUCTS

2.01 CONCRETE

- A. Concrete: Class B in accordance with Section 03315 - Concrete for Utility Construction as shown on the Drawings.

2.02 AGGREGATE MATERIALS

- A. Use poorly graded cobbles with diameter greater than 3-inches and less than 5-inches.
- B. Provide gravel lining in accordance with Section 02320 – Utility Backfill Materials or as shown on the drawings.

- C. Provide clean cobbles and gravel consisting of crushed concrete or stone. Use clean, hard crushed concrete or stone free from adherent coatings, salt, alkali, dirt, clay, loam, shale, soft or flaky materials, or organic matter.
- D. Sediment Pump Pit Aggregate: Use nominal 2-inch diameter river gravel.

2.03 PIPE

- A. Polyethylene culvert pipe or PVC sewer pipe in accordance with Section 02505- High Density Polyethylene (HDPE) Solid and Profile Wall Pipe and Section 02506 Polyvinyl Chloride Pipe or as shown on the Drawings.
- B. Inlet Pipes: Galvanized steel pipe in accordance with Section 02642 Corrugated Metal Pipe or as shown on the Drawings.
- C. Standpipe for Sediment Pump Pits: Galvanized round culvert pipe or round PVC pipe, minimum of 12-inch and a maximum of 24-inch diameter, perforate at 6 to 12-inch centers around circumference.

2.04 GEOTEXTILE FILTER FABRIC

- A. Woven or nonwoven geotextile filter fabric made of either polypropylene, polyethylene, ethylene, or polyamide material, in continuous rolls of longest practical length.
- B. Grab Strength: 100 psi in any principal direction (ASTM D-4632), Mullen burst strength >200 psi (ASTM D-3786), and equivalent opening size between 50 and 140.
- C. Furnish ultraviolet inhibitors and stabilizers for minimum 6 months of expected usable construction life at temperature range of 0 degrees F to 120 degrees F.
- D. Mirafi, Inc., Synthetic Industries, or equivalent

2.05 BARRIER

- A. Wire Barrier: Woven galvanized steel wire, 14 gauge by 6-inch square mesh spacing, minimum 24-inch roll or sheet width of longest practical length.
- B. Barrier Stakes: Nominal 2 by 2-inch moisture-resistant treated wood or steel posts (min. of 1.25 lbs. per linear foot and Brinell Hardness greater than 140) with safety caps on top; length as required for minimum 8-inch bury and full height of filter fabric.

2.06 SANDBAGS

- A. Provide woven material made of polypropylene, polyethylene, or polyamide material.

1. Minimum unit weight of four ounces per square yard.
2. Minimum grab strength of 100 lbs. in any principal direction (ASTM D4632).
3. Mullen burst strength exceeding 300 lbs. (ASTM D4833).
4. Ultraviolet stability exceeding 70 percent. After 500 hours of exposure (ASTM 4355).
5. Size: Length - 18 to 24-inches. Width - 12 to 18-inches. Thickness: 6 to 8-inches. Weight: Approximately 40 to 50 pounds not to exceed 75 pounds.

2.07 BAGGED GRAVEL BARRIERS

1. Minimum unit weight of four ounces per square yard.
2. Minimum grab strength of 100 lbs. in any principal direction (ASTM D4632).
3. Mullen burst strength exceeding 300 lbs. (ASTM D4833).
4. Ultraviolet stability exceeding 70 percent. After 500 hours of exposure (ASTM 4355).
5. Size: Length - 18 to 24-inches. Width - 12 to 18-inches. Thickness: 6 to 8-inches. Weight: Approximately 40 to 50 pounds not to exceed 75 pounds.

2.08 DROP INLET BASKETS

- A. Provide steel frame members in accordance with ASTM A36.
- B. Construct top frame of basket with two short sides of 2-inch by 2-inch and single long side of 1-inch by 1-inch, 1/8-inch angle iron. Construct basket hangers of 2-inch by 1/4-inch iron bars. Construct bottom frame of 1-inch by 1/4-inch iron bar or 1/4-inch plate with cent 3-inches removed. Use minimum 1/4-inch diameter iron rods or equivalent for sides of inlet basket.
- C. Weld minimum of 14 rods in place between top frame/basket hanger and bottom frame. Exact dimensions for top frame and insert basket will be determined based on dimensions of type of inlet being protected.

2.09 HAY BALE

- A. Hay: Standard-baled agricultural hay bound by wire, nylon, or polypropylene rope. Do not use jute or cotton binding.

- B. Hay Bale Stakes (applicable where bales are on soil): No. 3 (3/8 diameter) reinforcing bars, deformed or smooth at Contractor's option, length as required for minimum 18 inch bury and full height bales.

PART 3 EXECUTION

3.01 PREPARATION, INSTALLATION AND MAINTENANCE

- A. Provide erosion and sediment control structures at locations shown on the Drawings.
- B. Do not clear, grub or rough cut until erosion and sediment control systems are in place unless approved by Project Manager to allow installation of erosion and sediment control systems, soil testing and surveying.
- C. Maintain existing erosion and sediment control systems located within project site until acceptance of Project or until directed by Project Manager to remove and discard existing system.
- D. Regularly inspect and repair or replace damaged components of erosion and sediment control structures. Unless otherwise directed, maintain erosion and sediment control structure until project area stabilization is accepted. Redress and replace granular fill at outlets as needed to replenish depleted granular fill. Remove erosion and sediment control structures promptly when directed by Project Manager. Dispose of materials in accordance with Section 01576 - Waste Material Disposal.
- E. Remove and dispose sediment deposits at the designated spoil site for the Project. If a project spoil site is not designated on Drawings, dispose of sediment off site at approved location in accordance with Section 01576 - Waste Material Disposal.
- F. Unless otherwise shown on the Drawings, compact embankments, excavations, and trenches in accordance with Section 02315 - Roadway Excavation or Section 02317 - Excavation and Backfill for Utilities.
- G. Prohibit equipment and vehicles from maneuvering on areas outside of dedicated right of way and easements for construction. Immediately repair damage caused by construction traffic to erosion and sediment control structures.
- H. Protect existing trees and plants in accordance with Section 01562 – Tree and Plant Protection.

3.02 SEDIMENT TRAPS

- A. Install sediment traps so that surface runoff shall percolate through system in sheet flow fashion and allow retention and accumulation of sediment.

STORM WATER POLLUTION PREVENTION CONTROL

- B. Inspect sediment traps after each rainfall, daily during periods of prolonged rainfall, and at a minimum once each week. Repair or replace damaged sections immediately.
- C. Use fill material for embankment in accordance with Section 02320 – Utility Backfill Materials.
- D. Excavation length and height shall be as specified on Drawings. Use side slopes of 2:1 or flatter.
- F. Stone outlet sediment traps:
 - 1. Maintain minimum of 6-inches between top of core material and top of stone outlet, minimum of 4-inches between bottom of core material and existing ground and minimum of 1 foot between top of stone outlet and top of embankment.
 - 2. Embed cobbles minimum of 4-inches into existing ground for stone outlet. Core shall be minimum of 1 foot in height and in width and wrapped in triple layer of geotextile filter fabric.
- F. Sediment Basin with Pipe Outlet Construction Methods: Install outlet pipe and riser as shown on the Drawings.
- G. Remove sediment deposits when design basin volume is reduced by one-third or sediment level is one foot below principal spillway crest, whichever is less.

3.03 FILTER FABRIC BARRIER CONSTRUCTION METHODS

- A. Fence Type 1: Filter Fabric: Barrier
 - 1. Install stakes 3 feet on center maximum and firmly embed minimum 8-inches in soil. If filter fabric is factory preassembled with support netting, then maximum support spacing is 8 feet. Install wood stakes at a slight angle toward the source of anticipated runoff.
 - 2. Trench in the toe of the fence lines so the downward face of the trenches is flat and perpendicular to direction of flow. V-trench configuration as shown on Drawings may also be used.
 - 3. Lay fabric along edges of trenches in longest practical continuous runs to minimize joints. Make joints only at a support post. Splice with minimum 6- inch overlap and seal securely.
 - 4. Staple filter fabric to stakes at maximum 3-inches on center. Extend fabric minimum 18-inches and maximum 36 inches above natural ground.

5. Backfill and compact trench.

B. Barrier Type 2: Reinforced Filter Fabric Barrier

1. Layout barrier same as for Type 1.

2. Install stakes at 6-feet on center maximum and at each joint in wire fence, firmly embedded 1-foot minimum, and inclined it as for Type 1.

3. Tie wire fence to stakes with wire at 6-inches on center maximum. Overlap joints minimum one bay of mesh.

4. Install trench same as for Type 1.

5. Fasten filter fabric wire fence with tie wires at 3-inches on center maximum.

6. Layout fabric same as for Type 1. Fasten to wire fence with wire ties at 3-inches on center maximum and, if applicable, to stakes above top of wire fence it as for Type 1.

7. Backfill and compact trench.

8. Attach filter fabric to wooden fence stakes spaced a maximum of 6-feet apart or steel fence stakes spaced a maximum of 8 feet apart and embedded a minimum of 12-inches. Install stakes at a slight angle toward source of anticipated runoff.

9. Trench in toe of filter fabric barrier with spade or mechanical trencher so that downward face of trench is flat and perpendicular to direction of flow. A V-trench configuration may also be used. Lay filter fabric along edges of trench. Backfill and compact trench upon completion of Construction.

10. Filter fabric fence shall have a minimum height of 18-inches and a maximum height of 36-inches above natural ground.

11. Cut length of fence to minimize use of joints. When joints are necessary, splice fabric together only at support post with minimum 6-inch overlap and seal securely.

12. When used in swales, ditches or diversions, elevation of barrier at top of filter fabric. at flow line location in channel shall be lower than bottom elevation of filter fabric at ends of barrier or top of bank, whichever is less, in order to keep storm water discharge in channel from overtopping bank.

C. Triangular Filter Fabric Barrier Construction Methods

1. Attach filter fabric to wire fencing, 18-inches on each side. Provide a fabric cover and skirt with continuous wrapping of fabric. Skirt should form continuous extension of fabric on upstream side of fence.
2. Secure triangular fabric filter barrier in place using one of the following methods:
 - a. Toe-in skirt 6-inches with mechanically compacted material;
 - b. Weight down skirt with continuous layer of 3-inch to 5-inch graded rock; or,
 - c. Trench-in entire structure 4 inches.
3. Anchor triangular fabric filter barrier structure and skirt securely in place using 6-inch wire staples on 2-foot centers on both edges and on skirt or staked using 18-inch by 3/8-inch diameter re-bar with tee ends.
4. Lap fabric filter material by 6-inches to cover segment joints. Fasten joints with galvanized shoat rings.

3.04 DIKE AND SWALE

- A. Unless otherwise indicated, maintain minimum dike height of 18-inches, measured from cleared ground at up slope toe to top of dike. Maintain side slopes of 2:1 or flatter.
- B. Dike and Swale Stabilization: When shown on the Drawings, place gravel lining 3-inches thick and compacted into the soil or 6-inches thick if truck crossing is expected. Extend gravel lining across bottom and up both sides of swale minimum height of 8-inches vertically, above bottom. Gravel lining on dike side shall extend up the up-slope side of dike a minimum height of 8-inches, measured vertically from interface of existing or graded ground and up slope toe of dike, as shown on Drawings.
- C. Divert flow from dikes and swales to sediment basins, stabilized outlets, or sediment trapping devices of types and at locations shown on Drawings. Grade dikes and swales as shown on Drawings, or, if not specified, provide positive drainage with maximum grade of 1 percent to outlet or basin.
- D. Clear in accordance with Section 02233 – Clearing and Grubbing Compact embankments in accordance with Section 02315 – Roadway Excavation.
- E. Carry out excavation for swale construction so that erosion and water pollution is minimal. Minimum depth shall be 1-foot and bottom width shall be 4-feet, with level swale bottom. Excavation slopes shall be 2:1 or flatter. Clear, grub and strip excavation area of vegetation and root material.

3.05 DOWN SPOUT EXTENDER

- A. Down spout extender shall have slope of approximately 1 percent. Use pipe diameter of 4-inches or as shown on the Drawings. Place pipe in accordance with Section 02317 - Bedding and Backfill for Utilities.

3.06 PIPE SLOPE DRAIN

- A. Compact soil around and under drain entrance section to top of embankment in lifts appropriately sized for method of compaction utilized.
- D. Inlet pipe shall have slope of 1 percent or greater. Use pipe diameter as shown on the Drawings.
- C. Top of embankment over inlet pipe and embankments directing water to pipe shall be at least 1-foot higher at all points than top of inlet pipe.
- D. Pipe shall be secured with hold-down grommets spaced 10-feet on centers.
- E. Place riprap apron with a depth equal to pipe diameter with 2:1 side slope.

3.07 PAVED FLUME

- A. Compact soil around and under the entrance section to top of the embankment in lifts appropriately sized for method of compaction utilized.
- B. Construct subgrade to required elevations. Remove and replace soft sections and unsuitable material. Compact subgrade thoroughly and shape to a smooth, uniform surface.
- C. Construct permanent paved flumes in accordance with Drawings.
- D. Remove sediment from riprap apron when sediment has accumulated to depth of one foot.

3.08 LEVEL SPREADER

- A. Construct level spreader on undisturbed soil and not on fill. Ensure that spreader lip is level for uniform spreading of storm runoff.
- B. Maintain at required depth, grade, and cross section as specified on Drawings. Remove sediment deposits as well as projections or other irregularities which will impede normal flow.

3.09 INLET PROTECTION BARRIER

- A. Place sandbags for Stage I, Bagged gravel for Stage II and filter fabric barriers at locations shown on the SWP3. Maintain to allow minimal inlet in flow restrictions / blockage during storm event.

3.10 DROP INLET BASKET CONSTRUCTION METHODS

- A. Fit inlet insert basket into inlet without gaps around insert at locations shown on SWP3.
- B. Support for inlet insert basket shall consist of fabricated metal as shown on Drawings.
- C. Push down and form filter fabric to shape of basket. Use sheet of fabric large enough to be supported by basket frame when holding sediment and extend at least 6-inches past frame. Place inlet grates over basket/frame to serve as fabric anchor.
- D. Remove sediment deposit after each storm event and whenever accumulation exceeds 1-inch depth during weekly inspections.

3.11 HAY BALE FENCE CONSTRUCTION METHODS

- A. Place bales in row with ends tightly abutting adjacent bales. Place bales with bindings parallel to ground surface.
- B. Embed bale in soil a minimum of 4-inches.
- C. Securely anchor bales in place with Hay Bale Stakes driven through bales a minimum of 18-inches into ground. Angle first stake in each bale toward previously laid bale to force bales together.
- D. Fill gaps between bales with straw to prevent water from channeling between bales. Wedge carefully in order not to separate bales.
- E. Replace with new hay bale fence every two months or as required by Project Manager.

3.12 BRUSH BERM CONSTRUCTION METHODS

- A. Construct brush berm along contour lines by hand placing method. Do not use machine placement of brush berm.
- B. Use woody brush and branches having diameter less than 2-inches with 6- inches overlap. Avoid incorporation of annual weeds and soil into brush berm.
- C. Use minimum height of 18-inches measured from top of existing ground at upslope toe to top of berm. Top width shall be 24-inches minimum and side slopes shall be 2:1 or flatter.

- D. Embed brush berm into soil a minimum of 4-inches and anchor using wire, nylon or polypropylene rope across berm with a minimum tension of 50 pounds. Tie rope securely to 18-inch x 3/8-inch diameter rebar stakes driven into ground on 4-foot centers on both sides of berm.

3.13 STREET AND SIDEWALK CLEANING

- A. Keep areas clean of construction debris and mud carried by construction vehicles and equipment. If necessary, install stabilized construction exits at construction, staging, storage, and disposal areas, following Section 01575 - Stabilized Construction Exit.
- B. In lieu of or in addition to stabilized construction exits, shovel or sweep pavements as required to keep areas clean. Do not water hose or sweep debris and mud off street into adjacent areas, except, hose sidewalks during off-peak hours, after sweeping.

3.14 WASTE COLLECTION AREAS

- A. Prevent water runoff from passing through waste collection areas and prevent water runoff from waste collection areas migrating outside collection areas.

3.15 EQUIPMENT MAINTENANCE AND REPAIR

- A. Confine maintenance and repair of construction machinery and equipment to areas specifically designated for that purpose, so fuels, lubricants, solvents, and other potential pollutants are not washed directly into receiving streams or storm water conveyance systems. Provide these areas with adequate waste disposal receptacles for liquid and solid waste. Clean and inspect maintenance areas daily.
- B. Where designated equipment maintenance areas are not feasible, take precautions during each individual repair or maintenance operation to prevent potential pollutants from washing into streams or conveyance systems. Provide temporary waste disposal receptacles.

3.16 VEHICLE/ EQUIPMENT WASHING AREAS

- A. Install wash area (stabilized with coarse aggregate) adjacent to stabilized construction access, as required to prevent mud and dirt run-off. Release wash water into drainage swales or inlets protected by erosion and sediment controls. Build wash areas following Section 01575 - Stabilized Construction access. Install gravel or rock base beneath wash areas.
- B. Wash vehicles only at designated wash areas. Do not wash vehicles such as concrete delivery trucks or dump trucks and other construction equipment at locations where runoff flows directly into waterways or storm water conveyance systems.

- C. Locate wash areas to spread out and evaporate or infiltrate wash water directly into ground or collect runoff in temporary holding or seepage basins.

3.17 WATER RUNOFF AND EROSION CONTROL

- A. Control surface water, runoff, subsurface water, and water from excavations and structures to prevent damage to the Work, the site, or adjoining properties. Follow environment requirements.
- B. Control fill, grading and ditching to direct water away from excavations, pits, tunnels, and other construction areas, and to direct drainage to proper runoff courses to prevent erosion, sedimentation or damage.
- C. Provide, operate, and maintain equipment and facilities of adequate size to control surface water.
- D. Retain existing drainage patterns external to the site by constructing temporary earth berms, sedimentation basins, retaining areas, and temporary ground cover as required to control conditions.
- E. Plan and execute construction and earth work to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
 - 1. Hold area of bare soil exposed at one time to a minimum.
 - 2. Provide temporary controls such as berms, dikes, and drains.
- F. Construct fill and waste areas by selective placement to eliminate surface silts or clays which will erode.
- G. Inspect earthwork periodically to detect start of erosion. Immediately apply corrective measures as required to control erosion.
- H. Dispose of sediments offsite, not in or adjacent to waterways or floodplains, nor allow sediments to flush into streams or drainage ways. Assume responsibility for offsite disposal location.
- I. Unless otherwise indicated, compact embankments, excavations, and trenches by mechanically blading, tamping, and rolling soil in maximum of 8- inch layers. Provide compaction density at minimum 90 percent Standard Proctor ASTM D-698-78 density. Make at least one test per 500 cubic yards of embankment.
- J. Prohibit equipment and vehicles from maneuver on areas outside of dedicated rights-of-way and easements for construction. Immediately repair damage to erosion and sedimentation control systems caused by construction traffic.

STORM WATER POLLUTION PREVENTION CONTROL

- K. Do not damage existing trees intended to remain.

3.18 REMOVAL OF CONTROLS

- A. Remove erosion and sediment controls when the site is finally stabilized or as directed by Project Manager.
- B. Dispose of sediments and waste products following Section 01505 - Temporary Facilities.

END OF SECTION

**SECTION 01572
EROSION AND SEDIMENTATION CONTROL**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General erosion and sediment controls and other control-related practices. Provide and maintain erosion and sediment controls until the site is finally stabilized or as directed by City Engineer.
- B. Filter Fabric Fences:
 - 1. Type 1: Temporary filter fabric fences for erosion and sediment control in non-channelized flow areas.
 - 2. Type 2: Temporary reinforced filter fabric fences for erosion and sediment control in channelized flow areas.
- C. Straw Bale Fence.
- D. Temporary vehicle and equipment fueling areas, which require erosion and sediment controls, are specified in Section 01579.
- E. Dust controls are specified in Section 01506.

1.02 MEASUREMENT AND PAYMENT

- A. Control of erosion and sedimentation is incidental to the Work. Include costs for control of erosion and sedimentation in the cost of work for which it is required.

1.03 REFERENCES

- A. ASTM:
 - 1. D3786 - Standard Test Method for Hydraulic Bursting Strength for Knitted Goods and Nonwoven Fabrics.
 - 2. D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

1.04 SYSTEM DESCRIPTIONS

EROSION AND SEDIMENTATION CONTROL

- A. Filter Fabric Fence Type 1 and Type 2: Install to allow surface or channel runoff percolation through fabric in sheet-flow manner and to retain and accumulate sediment. Maintain Filter Fabric Fences to remain in proper position and configuration at all times.
- B. Straw Bale Fence: Install to allow surface runoff percolation through straw in sheet-flow manner and to retain and accumulate sediment. Maintain Straw Bale Fence to remain in proper position and configuration at all times.

1.05 SUBMITTALS

- A. Follow Section 01340 - Shop Drawings, Product Data and Samples.
- B. Submit manufacturer's catalog sheets and other product data on filter fabric and wire fencing.

PART 2 PRODUCTS

2.01 EROSION CONTROL PRODUCTS AND SYSTEMS

- A. Sandbags: Polypropylene, polyethylene, or polyamide woven fabric, with minimum unit weight of 4 ounces per square yard, Muller burst strength exceeding 300 psi, and ultraviolet stability exceeding 70 percent. Fill bags with bank-run sand.
- B. Standpipe for Sediment Pump Pits: Galvanized round culvert pipe or round PVC pipe, minimum of 12-inch and a maximum of 24-inch diameter, perforate at 6 to 12 inch centers around circumference.
- C. Sediment Pump Pit Aggregate: Nominal 2-inch diameter river gravel.
- D. Portable Sediment Tank System: Standard 55-gallon steel or plastic drums, free of hazardous material contamination.
 - 1. Shop or field fabricate tanks in series with main inlet pipe, intertank pipes and discharge pipes, using quantities sufficient to collect sediments from discharge water.
- E. Straw: Standard-baled agricultural hay bound by wire, nylon, or polypropylene rope. Do not use jute or cotton binding.
- F. Straw Bale Stakes (applicable where bales are on soil): No. 3 diameter concrete reinforcing bars, deformed or smooth at Contractor's option, length as required for minimum 8 inch bury and full height bales.
- G. Filter Fabric: Mirafi, Inc., Synthetic Industries, or equivalent following Section 01630.

1. Woven or nonwoven geotextile filter fabric made of either polypropylene, polyethylene, ethylene, or polyamide material, in continuous rolls of longest practical length.
 2. Grab Strength: 100 psi in any principal direction (ASTM D-4632), Mullen burst strength >200 psi (ASTM D-3786), and equivalent opening size between 50 and 140.
 3. Furnish ultraviolet inhibitors and stabilizers for minimum 6 months of expected usable construction life at temperature range of 0 degrees F to 120 degrees F.
- H. Wire Fencing: Woven galvanized steel wire, 14 gauge by 6-inch square mesh spacing, minimum 24-inch roll or sheet width of longest practical length.
- I. Fence Stakes: Nominal 2 by 2-inch moisture-resistant treated wood; length as required for minimum 8 inch bury and full height of filter fabric.

PART 3 EXECUTION

3.01 GENERAL

- A. Do not clear, grub or rough cut until erosion and sediment controls are in place, other than site work specifically directed by City Engineer to allow surveying and soil testing.
- B. Maintain existing erosion and sediment controls, if any, until directed by City Engineer to remove and dispose of existing controls.
- C. Prohibit equipment and vehicles from maneuvering on areas outside of dedicated rights-of-way and easements for construction. Immediately repair damage, caused by construction traffic, to erosion and sediment control systems.

3.02 INSPECTION AND REPAIR

- A. Inspect erosion and sedimentation controls daily during periods of prolonged rainfall, at end of rainfall period, and minimum once each week.
- B. Repair or replace damaged sections immediately.
- C. Remove eroded and sedimented products when silt reaches a depth one-third the height of the control or 6 inches, whichever is less.

3.03 FILTER FABRIC FENCES

- A. Layout fence lines with wood stakes.
- B. Fence Type 1:

1. Install stakes 3 feet on center maximum and firmly embed minimum 8 inches in soil. If filter fabric is factory preassembled with support netting, then maximum support spacing is 8 feet. Install wood stakes at a slight angle toward the source of anticipated runoff.
2. Trench in the toe of the fence lines so the downward face of the trenches is flat and perpendicular to direction of flow. V-trench configuration as shown on Drawings may also be used.
3. Lay fabric along edges of trenches in longest practical continuous runs to minimize joints. Make joints only at a support post. Splice with minimum 6-inch overlap and seal securely.
4. Staple filter fabric to stakes at maximum 3 inches on center. Extend fabric minimum 18 inches and maximum 36 inches above natural ground.
5. Backfill and compact trench.

C. Fence Type 2:

1. Layout fence same as for Type 1.
2. Install stakes at 6 feet on center maximum and at each joint in wire fence, firmly embedded 1-foot minimum, and inclined it as for Type 1.
3. Tie wire fence to stakes with wire at 6 inches on center maximum. Overlap joints minimum one bay of mesh.
4. Install trench same as for Type 1.
5. Fasten filter fabric wire fence with tie wires at 3 inches on center maximum.
6. Layout fabric same as for Type 1. Fasten to wire fence with wire ties at 3 inches on center maximum and, if applicable, to stakes above top of wire fence it as for Type 1.
7. Backfill and compact trench.

3.04 STRAW BALE FENCES

- A. Install bales in a row with ends tightly abutting adjacent bales. Place bales with bindings parallel to ground surface. Where bales are installed on soil:
 1. Embed bales in soil 4 inches minimum.
 2. Anchor bales with 2 stakes driven into soil, with top end of stake flush with top of bales. Angle the first stake in each bale toward previously laid bale to force bales together.

3. Fill gaps between bales with straw to prevent water from escaping between bales. Wedge carefully to not separate bales.

3.05 PLACEMENT OF TOPSOILS SPECIFIED IN OTHER SECTIONS

- A. Where topsoil is work of another Section, provide erosion controls following this Section during topsoil placement operations.
 1. When placing topsoil, maintain erosion and sediment control systems, such as swales, grade stabilization structures, berms, dikes, waterways, and sediment basins.
 2. Maintain grades previously established on areas receiving topsoil.
 3. After areas receiving topsoil are brought to grade, and immediately prior to dumping and spreading topsoil, loosen subgrade by discing or scarifying 2 inches deep minimum to permit bonding of topsoil to subsoil.
 4. Do not install sod or seed on soil treated with sterilants until sufficient time elapses to permit dissipation of chemicals.

3.06 STREET AND SIDEWALK CLEANING

- A. Keep areas clean of construction debris and mud carried by construction vehicles and equipment.
 1. If necessary, install stabilized construction exits at construction, staging, storage, and disposal areas, following Section 01575- Stabilized Construction Exit.
- B. In lieu of or in addition to stabilized construction exits, shovel or sweep pavements as required to keep areas clean. Do not waterhose or sweep debris and mud off street into adjacent areas, except, hose sidewalks during off-peak hours, after sweeping.

3.07 WASTE COLLECTION AREAS

- A. Prevent water runoff from passing through waste collection areas, and prevent water runoff from waste collection areas migrating outside collection areas.

3.08 EQUIPMENT MAINTENANCE AND REPAIR

- A. Confine maintenance and repair of construction machinery and equipment to areas specifically designated for that purpose or combine with temporary fueling area specified in Section 01579, so fuels, lubricants, solvents, and other potential pollutants are not washed directly into receiving streams or storm water conveyance systems. Provide these areas with adequate waste disposal receptacles for liquid and solid waste. Clean and inspect maintenance areas daily.

- B. Where designated equipment maintenance areas are not feasible, take precautions during each individual repair or maintenance operation to prevent potential pollutants from washing into streams or conveyance systems. Provide temporary waste disposal receptacles.

3.09 VEHICLE/ EQUIPMENT WASHING AREAS

- A. Install wash area (stabilized with coarse aggregate) adjacent to stabilized construction exit(s), as required to prevent mud and dirt run-off. Release wash water into drainage swales or inlets protected by erosion and sediment controls. Build wash areas following Section 01575- Stabilized Construction Exit. Install gravel or rock base beneath wash areas.
- B. Wash vehicles only at designated wash areas. Do not wash vehicles such as concrete delivery trucks or dump trucks and other construction equipment at locations where runoff flows directly into watercourses or storm water conveyance systems.
- C. Locate wash areas to spread out and evaporate or infiltrate wash water directly into ground or collect runoff in temporary holding or seepage basins.

3.10 PRODUCT STORAGE

- A. Follow Sections 01505- Temporary Facilities and 01610- Basic Product Requirements for basic storage requirements.
- B. Isolate areas where cements, solvents, paints, or other potential water pollutants are stored so they do not cause runoff pollution.
- C. Store toxic products, such as pesticides, paints, and acids following manufacturers= guidelines. Protect groundwater resources from leaching, with plastic mats, packed clay, tarpaper, or other impervious materials on areas where toxic products are opened and stored.

3.11 WATER RUNOFF AND EROSION CONTROL

- A. Control surface water, runoff, subsurface water, and water from excavations and structures to prevent damage to the Work, the site, or adjoining properties.
- B. Control fill, grading and ditching to direct water away from excavations, pits, tunnels, and other construction areas, and to direct drainage to proper runoff courses to prevent erosion, sedimentation or damage.
- C. Provide, operate, and maintain equipment and facilities of adequate size to control surface water.
- D. Dispose of drainage water to prevent flooding, erosion, or other damage to the site or adjoining areas. Follow environmental requirements.

- E. Retain existing drainage patterns external to the site by constructing temporary earth berms, sedimentation basins, retaining areas, and temporary ground cover as required to control conditions.
- F. Plan and execute construction and earth work to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation
 - 1. Hold area of bare soil exposed at one time to a minimum.
 - 2. Provide temporary controls such as berms, dikes, and drains.
- G. Construct fill and waste areas by selective placement to eliminate surface silts or clays which will erode.
- H. Inspect earthwork periodically to detect start of erosion. Immediately apply corrective measures as required to control erosion.
- I. Dispose of sediments offsite, not in or adjacent to streams or floodplains, nor allow sediments to flush into streams or drainage ways. Assume responsibility for offsite disposal location.
- J. Unless otherwise indicated, compact embankments, excavations, and trenches by mechanically blading, tamping, and rolling soil in maximum of 8-inch layers. Provide compaction density at minimum 90 percent Standard Proctor ASTM D-698-78 density. Make at least one test per 500 cubic yards of embankment.
- K. Do not maneuver vehicles on areas outside of dedicated rights-of-way and easements for construction. Immediately repair damage to erosion and sedimentation control systems caused by construction traffic.
- L. Do not damage existing trees intended to remain.

3.12 REMOVAL OF CONTROLS

- A. Remove erosion and sediment controls when the site is finally stabilized or as directed by City Engineer.
- B. Dispose of sediments and waste products following Section 01505 - Temporary Facilities.

END OF SECTION

**SECTION 01575
STABILIZED CONSTRUCTION ACCESS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Installation and removal of erosion and sediment control for stabilized construction access used during construction and prior to final development of site, as shown in City of Houston Standard Construction details, DWG No. 01571-01.

1.02 MEASUREMENT AND PAYMENT

- A. Unit Price Contracts. If Contract is Unit Price Contract, payment for work in this Section will be based on the following:
 - 1. Stabilized construction roads, parking areas, access and wash areas: per square yard of aggregate/recycled concrete without reinforcing placed in 8- inch layers. No separate payment will be made for street cleaning necessary to meet TPDES requirements. Include cost of work for street cleaning under related Specification section.
- B. Stipulated Price (Lump Sum) Contracts. If the Contract is a Stipulated Price Contract, include payment for work under this Section in the total Stipulated Price.

1.03 SUBMITTALS

- A. Conform to requirements of Section 01330 - Submittal Procedures.
- B. Submit manufacturer=s catalog sheets and other Product Data on geotextile fabric.
- C. Submit sieve analysis of aggregates conforming to requirements of this Specification.

1.04 REFERENCES

- A. ASTM D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
- B. Storm Water Quality Management Handbook For Construction Activities prepared by the City of Houston, Harris County and Harris County Flood Control District.

STABILIZED CONSTRUCTION ACCESS

PART 2 PRODUCTS

2.01 GEOTEXTILE FABRIC

- A. Provide woven or non-woven geotextile fabric made of polypropylene, polyethylene, ethylene, or polyamide material.
- B. Geotextile fabric: Minimum grab strength of 200 lbs. in any principal direction (ASTM D-4632) and equivalent opening size between 50 and 140.
- C. Geotextile and threads: Resistant to chemical attack, mildew, and rot and contain ultraviolet ray inhibitors and stabilizers to provide minimum of six months of expected usable life at temperature range of 0 to 120 degrees F.
- D. Representative Manufacturers: Mirafi, Inc. or equal.

2.02 COARSE AGGREGATES

- A. Coarse aggregate: Crushed stone, gravel, crushed blast furnace slag, or combination of these materials. Aggregate shall be composed of clean, hard, durable materials free from adherent coatings of, salt, alkali, dirt, clay, loam, shale, soft or flaky materials, or organic and injurious matter.
- B. Coarse aggregates to consist of open graded rock 2" to 8" in size.

PART 3 EXECUTION

3.01 PREPARATION AND INSTALLATION

- A. Provide stabilized construction roads and access at construction, staging, parking, storage, and disposal areas to keep street clean of mud carried by construction vehicles and equipment. Construct erosion and sediment controls in accordance with Drawings and Specification requirements.
- B. Do not clear grub or rough cut until erosion and sediment control systems are in place, unless approved by Project Manager to allow soil testing and surveying.
- C. Maintain existing construction site erosion and sediment control systems until acceptance of the Work or until removal of existing systems is approved by Project Manager.
- D. Regularly inspect, repair or replace components of stabilized construction access. Unless otherwise directed, maintain stabilized construction roads and access until the City accepts the Work. Remove stabilized construction roads and access promptly when directed by Project Manager. Discard removed materials off-site.

- E. Remove and dispose of sediment deposits at designated spoil site for Project. If a spoil site is not designated on Drawings, dispose of sediment off-site at a location not in or adjacent to stream or flood plain. Assume responsibility for off-site disposal.
- F. Spread compacted and stabilized sediment evenly throughout site. Do not allow sediment to flush into streams or drainage ways. Dispose of contaminated sediment in accordance with existing federal, state, and local rules and regulations.
- G. Prohibit equipment and vehicles from maneuvering on areas outside of dedicated rights-of-way and easements for construction. Immediately repair damage to erosion and sediment control systems caused by construction traffic.
- H. Conduct construction operations in conformance with erosion control requirements of Specification 01570 – Storm Water Pollution Control.

3.2 CONSTRUCTION MAINTENANCE

- A. Provide stabilized access roads, subdivision roads, parking areas, and other on-site vehicle transportation routes where shown on Drawings.
- B. Provide stabilized construction access and vehicle washing areas, when approved by Project Manager, of sizes and at locations shown on Drawings or as specified in this Section.
- C. Clean tires to remove sediment on vehicles leaving construction areas prior to entering public rights-of-way. Construct wash areas needed to remove sediment. Release wash water into drainage swales or inlets protected by erosion and sediment control measures.
- D. Details for stabilized construction access are shown on Drawings. Construct other stabilized areas to same requirements. Maintain minimum roadway widths of 14 feet for one-way traffic and 20 feet for two-way traffic and of sufficient width to allow ingress and egress. Place geotextile fabric as a permeable separator to prevent mixing of coarse aggregate with underlying soil. Limit exposure of geotextile fabric to elements between laydown and cover to a maximum 14 days to minimize potential damage.
- E. Grade roads and parking areas to provide sufficient drainage away from stabilized areas. Use sandbags, gravel, boards, or similar materials to prevent sediment from entering public rights-of-way, waterways or storm water conveyance systems.
- F. Inspect and maintain stabilized areas daily. Provide periodic top dressing with additional coarse aggregates to maintain required depth. Repair and clean out damaged control systems used to trap sediment. Immediately remove spilled, dropped, washed, or tracked sediment from public rights-of-way.

- G. Maintain lengths of stabilized areas as shown on Drawings or a minimum of 50 feet. Maintain a minimum thickness of 8 inches. Maintain minimum widths at all points of ingress or egress.
- H. Stabilize other areas with the same thickness, and width of coarse aggregate required for stabilized construction access, except where shown otherwise on Drawings.
- I. Stabilized areas may be widened or lengthened to accommodate truck washing areas when authorized by Project Manager.
- J. Clean street daily before end of workday. When excess sediments have tracked onto streets, Project Manager may direct Contractor to clean street as often as necessary. Remove and legally dispose of sediments.
- K. Use other erosion and sediment control measures to prevent sediment runoff during rain periods and non-working hours and when storm discharges are expected.

END OF SECTION

SECTION 01576
WASTE MATERIAL DISPOSAL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Disposal of waste material and salvageable material.

1.02 SUBMITTALS

- A. Conform to requirements of Section 01330 - Submittal Procedures.
- B. Submit copy of approved "Development Permit", as defined in Chapter 19 of Floodplain Ordinance (City Ordinance Number 81-914 and Number 85- 1705), prior to disposal of excess material in areas designated as being in "100-year Standard Flood Hazard Area" within the City and areas designated as being in "500-year Standard Flood Hazard Area". Contact the City of Houston Floodplain Management Office at the Houston Permitting Center (1002 Washington Avenue, 3rd Floor), at (832) 394-8854 for floodplain information.
- C. Obtain and submit disposal permits for proposed disposal sites, if required by local ordinances.
- D. Submit copy of written permission from property owner, with description of property, prior to disposal of excess material adjacent to Project. Submit written and signed release from property owner upon completion of disposal work.
- E. Describe waste materials expected to be stored on-site and a description of controls to reduce Pollutants from these materials, including storage practices to minimize exposure of materials to storm water; and spill prevention and response measures in the Project's Storm Water Pollution Prevention Plan (SWPPP). Refer to Section 01410 - TPDES Requirements.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SALVAGEABLE MATERIAL

- A. Excavated Material: When indicated on Drawings, load, haul, and deposit excavated material at location or locations shown on Drawings outside limits of Project.

WASTE MATERIAL DISPOSAL

- B. Base, Surface, and Bedding Material: Load shell, gravel, bituminous, or other base and surfacing material designated for salvage into City trucks.
- C. Pipe Culvert: Load culverts designated for salvage into City trucks.
- D. Other Salvageable Materials: Conform to requirements of individual Specification Sections.
- E. Coordinate loading of salvageable material on City trucks with Project Manager.

3.02 EXCESS MATERIAL

- A. Remove and legally dispose of vegetation, rubble, broken concrete, debris, asphaltic concrete pavement, excess soil, and other materials not designated for salvage from job site.
- B. Excess soil may be deposited on private property adjacent to Project when written permission is obtained from property owner. See Paragraph 1.02 D above.
- C. Verify floodplain status of any proposed disposal site. Do not dispose of excavated materials in area designated as within 100-year and 500-year Standard Flood Hazard Areas unless "Development Permit" has been obtained. Remove excess material placed in "100-year and 500-year Standard Flood Hazard Areas" within the City without "Development Permit", at no additional cost to the City.
- D. Remove waste materials from site daily, in order to maintain site in neat and orderly condition.

END OF SECTION

**SECTION 01578
CONTROL OF GROUND AND SURFACE WATER**

PART 1 GENERAL

1.02 SECTION INCLUDES

- A. Dewatering, depressurizing, draining, and maintaining trenches, shaft excavations, structural excavations and foundation beds in stable condition, and controlling ground water conditions for tunnel excavations.
- B. Protecting work against surface runoff and rising floodwaters.
- C. Trapping suspended sediment in the discharge from the surface and ground water control systems.

1.02 MEASUREMENT AND PAYMENT

A. UNIT PRICES

- 1. Measurement for control of ground water, if included in Document 00410 – Bid Form, will be on either a lump sum basis or a linear foot basis for continuous installations of wellpoints, eductor wells, or deep wells.
- 2. If not included in Document 00410 – Bid Form, include the cost to control ground water in unit price for work requiring such controls.
- 3. No separate payment will be made for control of surface water. Include cost to control surface water in unit price for work requiring controls.
- 4. Follow Section 01270 – Payment Procedures for unit price procedures.

- B. Stipulated Price (Lump Sum) Contract. If the Contract is a Stipulated Price Contract, include payment for work under this section in the total Stipulated Price.

1.03 REFERENCES

- A. ASTM D 698 - Standard Test Methods for Laboratory Compaction of Soils Using Standard Effort (12,400 ft-lbf/ft³ (600kN-m/m³))

CONTROL OF GROUND AND SURFACE WATER

- B. Federal Regulations, 29 CFR Part 1926, Standards-Excavation, Occupational Safety and Health Administration (OSHA)
- C. Storm Water Management Handbook for Construction Activities prepared by City of Houston, Harris County and Harris County Flood Control District.

1.04 DEFINITIONS

- A. Ground water control system: system used to dewater and depressurize water-bearing soil layers.
 - 1. Dewatering: lowering the water table and intercepting seepage that would otherwise emerge from slopes or bottoms of excavations, or into tunnels and shafts; and disposing of removed water. Intent of dewatering is to increase stability of tunnel excavations and excavations and excavated slopes, prevent dislocation of material from slopes or bottoms of excavations, reduce lateral loads on sheeting and bracing, improve excavating and hauling characteristics of excavated material, prevent failure or heaving of bottom of excavations, and to provide suitable conditions for placement of backfill materials and construction of structures and other installations.
 - 2. Depressurization: includes reduction in piezometric pressure within strata not controlled by dewatering alone, necessary to prevent failure or heaving of excavation bottom or instability of tunnel excavations.
- B. Excavation drainage: includes keeping excavations free of surface and seepage water.
- C. Surface drainage: includes use of temporary drainage ditches and dikes and installation of temporary culverts and sump pumps with discharge lines necessary to protect Work from any source of surface water.
- D. Monitoring facilities for ground water control system includes piezometers, monitoring wells and flow meters for observing and recording flow rates.

1.05 PERFORMANCE REQUIREMENTS

- A. Conduct subsurface investigations to identify groundwater conditions and top provide parameters for design, installation, and operation of groundwater control systems. Submit proposed method and spacing of readings for review prior to obtaining water level readings.
- B. Design ground water control system, compatible with requirements of Federal Regulations 29 CFR Part 1926 and Section 02260 -Trench Safety Systems, to produce following results:
 - 1. Effectively reduce hydrostatic pressure affecting:

CONTROL OF GROUND AND SURFACE WATER

- a. Excavations.
 - b. Tunnel excavation, face stability or seepage into tunnels.
2. Develop substantially dry and stable subgrade for subsequent construction operations.
3. Preclude damage to adjacent properties, buildings, structures, utilities, installed facilities and other work.
4. Prevent loss of fines, seepage, boils, quick condition, or softening of foundation strata.
5. Maintain stability of sides and bottoms of excavations.
- C. Provide ground water control systems that include single-stage or multiple-stage well point systems, eductor and ejector-type systems, deep wells, or combinations of these equipment types.
- D. Provide drainage of seepage water and surface water, as well as water from other sources entering excavation. Excavation drainage may include placement of drainage materials, crushed stone and filter fabric, together with sump pumping.
- E. Provide ditches, berms, pumps and other methods necessary to divert and drain surface water from excavation and other work areas.
- F. Locate ground water control and drainage systems so as not to interfere with utilities, construction operations, adjacent properties, or adjacent water wells.
- G. Assume sole responsibility for ground water control systems and for any loss or damage resulting from partial or complete failure of protective measures and settlement or resultant damage caused by ground water control operations. Modify ground water control systems or operations if they cause or threaten to cause damage to new construction, existing site improvements, adjacent property, adjacent water wells, or potentially contaminated areas. Repair damage caused by ground water control systems or resulting from failure of system to protect property as required.
- H. Install an adequate number of piezometers installed at proper locations and depths necessary to provide meaningful observations of conditions affecting excavation, adjacent structures and water wells. ,
- I. Install environmental monitoring wells at proper locations and depths necessary to provide adequate observations of hydrostatic conditions and possible contaminant transport from contamination sources into work area or ground water control system.

CONTROL OF GROUND AND SURFACE WATER

1.06 SUBMITTALS

- A. Conform to requirements of Section 01330 - Submittals Procedures.
- B. Submit Ground Water and Surface Water Control Plan for review by Project Manager prior to start of excavation work. Include the following:
 - 1. Results of subsurface investigations and description of extent and characteristics of water bearing layers subject to ground water control.
 - 2. Names of equipment Suppliers and installation Subcontractors
 - 3. Description of proposed ground water control systems indicating arrangement, location, depth and capacities of system components, installation details and criteria and operation and maintenance procedures
 - 4. Description of proposed monitoring facilities indicating depths and locations of piezometers and monitoring wells, monitoring installation details and criteria, type of equipment and instrumentation with pertinent data and characteristics
 - 5. Description of proposed filters including types, sizes, capacities and manufacturer's application recommendations
 - 6. Design calculations demonstrating adequacy of proposed systems for intended applications. Define potential area of influence of ground water control operation near contaminated areas.
 - 7. Operating requirements, including piezometric control elevations for dewatering and depressurization
 - 8. Excavation drainage methods including typical drainage layers, sump pump application and other means
 - 9. Surface water control and drainage installations
 - 10. Proposed methods and locations for disposing of removed water
- C. Submit following records upon completion of initial installation:
 - 1. Installation and development reports for well points, eductors, and deep wells
 - 2. Installation reports and baseline readings for piezometers and monitoring wells
 - 3. Baseline analytical test data of water from monitoring wells

CONTROL OF GROUND AND SURFACE WATER

4. Initial flow rates

- D. Submit the following records weekly during control of ground and surface water operations:
1. Records or flow rates and piezometric elevations obtained during monitoring of dewatering and depressurization. Refer to Paragraph 3.02, Requirements for Eductor, Well Points, or Deep Wells.
 2. Maintenance records for ground water control installations, piezometers and monitoring wells

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Comply with requirements of agencies having jurisdiction.
- B. Comply with Texas Commission on Environmental Quality regulation and Texas Water Well Drillers Association for development, drilling, and abandonment of wells used in dewatering system.
- C. Obtain necessary permits from agencies with jurisdiction over use of groundwater and matters affecting well installation, water discharge, and use of existing storm drains and natural water sources. Since review and permitting process may be lengthy, take early action to obtain required approvals.
- D. Monitor ground water discharge for contamination while performing pumping in vicinity of potentially contaminated sites.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIALS

- A. Select equipment and materials necessary to achieve desired results for dewatering. Selected equipment and materials are subject to review by Project Manager through submittals required in Paragraph 1.06, Submittals.
- B. Use experience contractors, regularly engaged in ground water control system design, installation, and operation, to furnish and install and operate educators, well, points, or deep wells, when needed.
- C. Maintain equipment in good repair and operating conditions.
- D. Keep sufficient standby equipment and materials available to ensure continuous operation, where required.

CONTROL OF GROUND AND SURFACE WATER

- E. Portable Sediment Tank System: Maintain equipment in good repair and operating conditions.
 - 1. Shop or field fabricate tanks in series with main inlet pipe, inter-tank pipes and discharge pipes, using quantities sufficient to collect sediments from discharge water.

PART 3 EXECUTION

3.01 GROUND WATER CONTROL

- A. Perform necessary subsurface investigation to identify water bearing layers, piezometric pressures and soil parameters for design and installation of ground water control systems. Perform pump tests, if necessary, to determine draw down characteristics. Present results in the Ground Water and Surface Water Control Plan submittal.
- B. Provide labor, material, equipment, techniques and methods to lower, control and handle ground water in manner compatible with construction methods and site conditions. Monitor effectiveness of installed system and its effect on adjacent property.
- C. Install, operate, and maintain ground water control systems in accordance with the Ground Water and Surface Water Control Plan. Notify Project Manager in writing of changes made to accommodate field conditions and changes to Work Provide revised drawings and calculations with notification.
- D. Provide continuous system operation, including nights, weekends, and holidays. Arrange appropriate backup if electrical power is primary energy source for dewatering system.
- E. Monitor operations to verify systems lower groundwater piezometric levels a rate required to maintain dry excavation resulting in stable subgrade for subsequent construction operations.
- F. Depressurize zones where hydrostatic pressures in confined water bearing layers exist below excavations to eliminate risk of uplift or other instability of excavation or installed works. Define allowable piezometric elevations in the Ground Water and Surface Water Control Plan.
- G. Removal of ground water control installations.
 - 1. Remove pumping system components and piping when ground water control is no longer required.
 - 2. Remove piezometers, including piezometers installed during design phase investigations and left for Contractor's use, upon completion of testing, as required in accordance with Part 3 of applicable specification.

CONTROL OF GROUND AND SURFACE WATER

3. Remove monitoring wells when directed by Project Manager.
 4. Grout abandoned well and piezometer holes. Fill piping that is not removed with cement-bentonite grout or cement-sand grout.
- H. During backfilling, maintain water level a minimum of 5 feet below prevailing level of backfill. Do not allow the water level to cause uplift pressures in excess of 80 percent of downward pressure produced by weight of structure or backfill in place. Do not allow water levels to rise into cement-stabilized sand until at least 48 hours after placement.
- I. Provide uniform pipe diameter for each pipe drain run constructed for dewatering. Remove pipe drains when no longer required. If pipe removal is impractical, grout connections at 50-foot intervals and fill pipe with cement-bentonite grout or cement-sand grout after removal from service.
- J. The extent of ground water control for structures with permanent perforated underground drainage systems may be reduced, for units designed to withstand hydrostatic uplift pressure. Provide a means to drain affected portions of underground systems, including standby equipment. Maintain drainage systems during construction operations.
- K. Remove systems upon completion of construction or when dewatering and control of surface or ground water is no longer required.
- L. Compact backfill to not less than 95 percent of maximum dry density in accordance with ASTM D 698.
- M. Foundation Slab: Maintain saturation line at least 3 feet below lowest elevations where concrete is to be placed. Drain foundations in areas where concrete is to be placed before placing reinforcing steel. Keep free from water for 3 days after concrete is placed.

3.02 REQUIREMENTS FOR EDUCTOR, WELL POINTS, OR DEEPWELLS

- A. For aboveground piping in ground water control system, include a 12-inch minimum length of clear, transparent piping between each eductor well or well point and discharge header to allow visual monitoring of discharge from each installation.
- B. Install sufficient piezometers or monitoring wells to show that trench or shaft excavations in water bearing materials are pre-drained prior to excavation. Provide separate piezometers for monitoring of dewatering and for monitoring of depressurization. Install piezometers and monitoring wells for tunneling as appropriate for selected method of work.
- C. Install piezometers or monitoring wells at least one week in advance of the start of associated excavation.

CONTROL OF GROUND AND SURFACE WATER

- D. Dewatering may be omitted for portions of under drains or other excavations, where auger borings and piezometers or monitoring wells show that soil is pre-drained by existing systems and that ground water control plan criteria are satisfied.
- E. Replace installations that produce noticeable amounts of sediments after development.
- F. Provide additional ground water control installations, or change method of control if, ground water control plan does not provide satisfactory results based on performance criteria defined by plan and by specifications. Submit revised plan according to Paragraph 1.06B.

3.03 SEDIMENT TRAPS

- A. Install sediment tank as shown on approved plan.
- B. Inspect daily and clean out tank when one-third of sediment tank is filled with sediment.

3.04 SEDIMENT SUMP PIT

- A. Install sediment tank as shown on approved plan.
- B. Construct standpipe by perforating 12-inch to 24-inch diameter corrugated metal or PVC pipe.
- C. Extend standpipe 12 inches to 18 inches above lip of pit.
- D. Convey discharge of water pumped from standpipe to sediment trapping device.
- E. Fill sites of sump pits compact to density of surrounding soil and stabilize surface when construction is complete.

3.05 EXCAVATION DRAINAGE

- A. Use excavation drainage methods if well-drained conditions can be achieved. Excavation drainage may consist of layers of crushed stone and filter fabric, and sump pumping, in combination with sufficient ground water control wells to maintain stable excavation and backfill conditions.

3.06 MAINTENANCE AND OBSERVATION

- A. Conduct daily maintenance and observation of piezometers or monitoring wells while ground water control installations or excavation drainage is operating at the site, or water is seeping into tunnels, and maintain systems in good operating condition.

- B. Replace damaged and destroyed piezometers or monitoring wells with new piezometers or wells as necessary to meet observation schedules.
- C. Cut off piezometers or monitoring wells in excavation areas where piping is exposed, only as necessary to perform observation as excavation proceeds. Continue to maintain and make specified observations
- D. Remove and grout piezometers inside or outside of excavation area when ground water control operations are complete. Remove and grout monitoring wells when directed by Project Manager.

3.07 MONITORING AND RECORDING

- A. Monitor and record average flow rate of operation for each deep well, or for each well point or eductor header used in dewatering system. Also, monitor and record water level and ground water recovery. Record observations daily until steady conditions are achieved and twice weekly thereafter.
- B. Observe and record elevation of water level daily as long as ground water control system is in operation, and weekly thereafter until Work is completed or piezometers or wells are removed, except when Project Manager determines more frequent monitoring and recording are required. Comply with Project Manager's direction for increased monitoring and recording and take measures necessary to ensure effective dewatering for intended purpose.

3.08 SURFACE WATER CONTROL

- A. Intercept surface water and divert it away from excavations through use of dikes, ditches, curb walls, pipes, sumps or other approved means. Requirement includes temporary works required to protect adjoining properties from surface drainage caused by construction operations.
- B. Divert surface water and seepage water into sumps and pump it into drainage channels or storm drains, when approved by agencies having jurisdiction. Provide settling basins when required by agencies.

END OF SECTION

SECTION 01579

TEMPORARY VEHICLE AND EQUIPMENT FUELING AREA

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Installation of erosion and sediment control for a temporary vehicle and equipment fueling area for aboveground fuel storage tank, which will be on site for more than 48 hours.

1.02 SUBMITTALS

- A. Follow Section 01340 - Shop Drawings, Product Data and Samples.
- B. Submit manufacturer's catalog sheets and other product data on dispensing equipment, pump, and aboveground fuel storage tanks, indicating the capacity and dimensions of the tank.
- C. Submit drawings to show the location of tank protection area and driveway. Indicate the nearest inlet or channelized flow area. Clearly dimension all distances and measurements.
- D. Submit a copy of Contractor's spill response and containment procedures to City Engineer. In lieu of the above, the Contractor shall submit a written statement declaring that the ?Spill Containment Procedures contained in the Airport's pollution prevention plan will be used in the event of a spill, and that a copy of the spill procedures will be located on-site.
- E. Submit a list of significant materials to be used or stored at the airport construction site. Submit statement that all significant materials and associated waste containers that are to be used or stored overnight at the airport construction site will be properly labeled.
- F. Submit a list of spill containment equipment, and quantities thereof, located at the fueling area.
- G. Submit manufacturer's catalog sheets and other product data on geotextile fabric.
- H. Submit inspection reports after the fueling site has been returned to its original condition or constructed in accordance with the Drawings.

1.03 MEASUREMENT AND PAYMENT

- A. Unless indicated in Document 00405 - Bid Tabulation Form, the Temporary Vehicle and Equipment Fueling Area is incidental to the Work. Include costs for Temporary Vehicle and Equipment Fueling Area in the cost of work for which it is required.

TEMPORARY VEHICLE AND EQUIPMENT FUELING AREA

- B. When indicated in Document 00405 - Bid Tabulation Form, measurement and payment for Temporary Vehicle and Equipment Fueling Area will be on a lump sum basis. The Temporary Vehicle and Equipment Area measured as stated, will be paid for at the unit price bid for "Temporary Vehicle and Equipment Fueling Area, Complete in Place."

1. Payment for Temporary Vehicle and Equipment Fueling area will include and be full compensation for all labor, equipment, materials, supervision, and all incidental expenses for construction of these items, complete in place, including, but not limited to, embankment and excavation, concrete foundation and curbs, protection barrier, driveway, maintenance requirements, repair and replacement of damaged sections, removal of sediment deposits, redressing of aggregates and stones, and removal of erosion and sedimentation control systems at the end of construction.

1.04 QUALITY ASSURANCE

- A. Person conducting visual examination for pollutant shall be fully knowledgeable about the NPDES Construction General Permit, detecting sources of storm water contaminants, inspection of aboveground storage tank and appurtenances for leakage, and the day to day operations that may cause unexpected pollutant releases.

PART 2 PRODUCTS

2.01 ABOVEGROUND STORAGE TANK

- A. Tank Assembly: Must be listed with UL 1709 and UL 2085.
- B. Inner Steel Storage Tank: Follow UL 142, with minimum thickness of 1/8-inch all welded construction.
- C. Tank Encasement: Either concrete or steel to provide a minimum of 110 percent containment of the inner tank capacity. Provide 5-gallon overspill containment pan for tank refueling.
- D. Dispenser Pump: For submersible pump, UL listed emergency shut-off valve to be installed at each dispenser. For suction pump, UL listed vacuum-activated shut-off valve, with a shear section, is to be installed at each dispenser. Fuel may not be dispensed from a tank by gravity flow or by pressurization of the tank. Means must be provided to prevent release of fuel by siphon flow.
- E. Representative Manufacturers: Convault, Fireguard, EcoVault, SuperVault, or equal.

2.02 CONCRETE

- A. Follow Section 03310 - Structural Concrete with a minimum concrete strength of 4,000 psi at 28 days.

TEMPORARY VEHICLE AND EQUIPMENT FUELING AREA

2.03 AGGREGATES

- A. Coarse aggregate shall consist of crushed stone, gravel, crushed blast furnace slag, or a combination of these materials. Aggregate shall be composed of clean, hard, durable materials, free from adherent coatings, salt, alkali, dirt, clay, loam, shale, soft or flaky materials, or organic and injurious matter.
- B. Coarse aggregate shall conform to the following gradation requirements.

Sieve Size (Square Mesh)	Percent Retained (By Weight)
2-1/2"	0
2"	0 - 20
1-1/2"	15-50
3/4"	60-80
No. 4	95-100

2.04 GEOTEXTILE FABRIC

- A. Woven or non-woven geotextile filter fabric made of either polypropylene, polyethylene, ethylene, or polyamide material, in continuous rolls of longest practical length.
- B. Grab Strength: 270 psi in any principal direction (ASTM D-4632), Mullen burst strength exceeding 200 psi (ASTM D-3786), and the equivalent opening size between 50 and 140.
- C. Furnish ultraviolet inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0°F to 120°F.
- D. Representative Manufacturers: Mirafi, Inc., Synthetic Industries, or equal.

PART 3 EXECUTION

3.01 GENERAL

- A. Follow Section 01572 - Erosion and Sedimentation Control.
- B. Do not clear, grub, or rough cut until erosion and sedimentation control systems are in place, unless otherwise approved by City Engineer.
- C. Maintain existing erosion and sedimentation control systems located within the project site installed by others prior to start of construction under this contract until acceptance of the project or until directed by the City Engineer to remove and dispose the existing systems.
- D. Inspect and repair or replace components of all erosion and sedimentation control systems as specified for each type of system. Unless otherwise directed, maintain the erosion and sedimentation control systems until acceptance of the project. Remove erosion and

sedimentation control systems promptly when directed by the City Engineer and dispose of removed materials offsite.

- E. Remove and dispose of sediments deposits at the project spoil site. If a project spoil site is not designated on Drawings, dispose sediment at an offsite location. Contractor assumes responsibility for offsite disposal location. Sediment shall be disposed of at an offsite location not in or adjacent to a stream or floodplain. Spread, compact, and stabilize sediment placed at the project site in accordance with the directions of the City Engineer. Do not allow sediment to flush into a stream or drainage way. If sediment is contaminated, dispose of sediment in accordance with federal, state and local regulations.
- F. Do not maneuver equipment or vehicles on areas outside of dedicated rights-of-way and easements for construction. Immediately repair damages caused by construction traffic to erosion and sedimentation control systems.
- G. Employ protective measures to avoid damage to existing trees to be retained on the project site. Conduct all construction operations under this Contract in conformance with the erosion control practices described in Section 01572 - Erosion and Sedimentation Control.
- H. Contractor to prepare spill response and containment procedures to be implemented in the event of a significant materials spill. Significant materials include but are not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical required to be reported pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as slag, ashes and sludge that have the potential to be released with storm water discharges. In lieu of developing procedures stated above, ?Spill Containment Procedures enclosed in the airport's pollution prevention plan may be used. Spill procedures shall be kept on-site at the airport construction site.
- I. Spill containment equipment appropriate to the size of operation is to be located in close proximity to the fueling area. Such equipment includes, but not limited to, suitable waste containers for significant materials, drip pans, booms, inlet covers, or absorbent.
- J. All significant materials or waste containers used for airport construction activities and stored on-site at the airport overnight are to be properly labeled.

3.02 CONSTRUCTION METHODS

- A. Provide fuel tank protection area and driveway as shown on the Drawings, or equivalent if prior written approval has been given by City Engineer.
- B. Do not locate fueling area in or near a channelized flow area or close to a storm sewer conveyance system. Sufficient space must be provided to allow installation of other erosion and sediment controls to protect those areas.

- C. Clear and grub the fueling area to remove unsuitable materials. Place geotextile fabric as permeable separator to prevent mixing of coarse aggregate with underlying soil. Overlap fabric a minimum of 6 inches. Place coarse aggregate on top of the geotextile fabric to minimum depth of 8 inches.
- D. Grade protection area and driveway to provide sufficient drainage away from stabilized areas. Use sandbags, gravel, boards, or similar methods to prevent sediment from entering public right-of-way, receiving stream or storm water conveyance system. The driveway to the fuel tank area shall have a minimum width of 15 feet for one-way traffic and 30 feet for two-way traffic.
- E. Place the aboveground storage tank on top of the cast-in-place or pre-cast foundation. The size and thickness of the foundation shall be based on the size and weight of the tank to be used, with a minimum thickness of 6 inches. The concrete foundation shall be enclosed by a 5-inch by 5-inch concrete curb and shall extend a minimum of 1 foot beyond the tank and dispenser assemblies, so that leak and drip can be contained within the concrete foundation.
- F. Slope the concrete foundation a minimum of 1 percent toward a 6-inch wide by 12-inch long by 4-inch deep sump pit. Install a minimum of 2-inch pipe inside the sump pit with a valve on the outside of the curb to allow draining of the concrete foundation.
- G. Install a portable concrete jersey barrier around the concrete foundation. Provide a minimum clearance of 2 feet from the edge of the foundation. In lieu of the jersey barrier, Contractor can install 4-inch diameter steel pipe bollards around the foundation. The bollards shall be buried a minimum of 3 feet deep, 3 feet aboveground, and 4 feet on center, encased in a 12-inch wide concrete foundation.

3.03 MAINTENANCE

- A. Inspect stabilized areas after every storm event and at least once a week. Provide periodic top dressing with additional coarse aggregate to maintain the required depth. Repair and clean out damaged control measures used to trap sediment.
- B. Inspect fuel tank foundation's bermed area after every storm event and at least once a week. Visually examine storm water contained in the tank's bermed foundation area for oil sheen or other obvious indicators of storm water pollution. Properly dispose of the storm water when significant amount of pollutant is present (as defined in Federal Register, Vol. 60, No. 189, Friday, September 29, 1995). Record visual examination of storm water discharge in a Report noting the date and time of examination, name of examiner, observations of water quality, and volume of storm water discharged from the bermed area. The Report shall be kept together with all other storm water pollution control inspection reports on the site, in a readily accessible location. The Report shall be maintained for the duration of the construction activity, and thereafter in accordance with the provisions of Section 01571 - NPDES Requirements.

3.04 TEMPORARY FUELING AREA CLOSURE

TEMPORARY VEHICLE AND EQUIPMENT FUELING AREA

A. The temporary vehicle and equipment fueling area shall be disposed of by removal of all sediment and erosion controls properly offsite. City Engineer will inspect the top soils in the fueling area and immediate vicinity for evidence of fuel leaks. If the City Engineer determines that sufficient pollutants have been released, the soil shall be removed and properly disposed offsite. Other remediation method may be required at no additional cost to the City.

**SECTION 01610
BASIC PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements for transportation, delivery, handling, and storage of Products.

1.02 PRODUCTS

- A. Products: Defined in Document 00700 – General Conditions. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components designated for reuse.
- B. For material and equipment specifically indicated or specified to be reused in the work:
 - 1. Use special care in removal, handling, storage and reinstallation, to assure proper function in completed work.
 - 2. Arrange for transportation, storage and handling of products which require off-site storage, restoration or renovation. Include cost in unit price for related items.
- C. When contract documents require that installation of work comply with manufacturer's printed Instructions, obtain and distribute copies of such instructions to parties involved in installation, including two copies to Project Manager. Maintain one set of complete instructions at job site during installation until completion.
- D. Provide Products from the fewest number of manufacturers as practical, in order to simplify spare parts inventory and to allow for maximum interchangeability of components. For multiple components of the same size, type or application, use the same make and model of component throughout the Work.

1.03 TRANSPORTATION

- A. Make arrangements for transportation, delivery, and handling of Products required for timely completion of the Work.
- B. Transport and handle Products in accordance with manufacturer's instructions.
- C. Consign and address shipping documents to proper party giving name of the Project and its complete street address. Shipments shall be delivered to Contractor.

BASIC PRODUCT REQUIREMENTS

1.04 DELIVERY

- A. Arrange deliveries of Products to accommodate short-term site completion schedules and in ample time to facilitate inspection prior to Installation. Avoid deliveries that cause lengthy storage or overburden of limit storage space.
- B. Coordinate deliveries to avoid conflict with the Work and conditions at the site and to accommodate the following:
 - 1. Work of other contractors or the City.
 - 2. Limitations of storage space.
 - 3. Availability of equipment and personnel for handling Products.
 - 4. The City's use of premises.
- C. Have Products delivered to the site in manufacturer's original, unopened, labeled containers.
- D. Immediately upon delivery, inspect shipment to assure:
 - 1. Product complies with requirements of the Contract.
 - 2. Quantities are correct.
 - 3. Containers and packages are intact; labels are legible.
 - 4. Products are properly protected and undamaged.

1.05 PRODUCT HANDLING

- A. Coordinate off-loading of Products delivered to the site. If necessary, during construction, move and relocate stored Products at no additional cost to the City.
- B. Provide equipment and personnel necessary to handle Products, including those provided by the City, by methods to prevent damage to Products or packaging.
- C. Provide additional protection during handling as necessary to prevent breaking, scraping, marring, or otherwise damaging Products or surrounding areas.
- D. Handle Products by methods to prevent over-bending or overstressing.
- E. Lift heavy components only at designated lifting points.

- F. Handle Products by methods to prevent over-bending or overstressing.
- G. Do not drop, roll, or skid Products off delivery vehicles. Hand-carry or use Suitable materials handling equipment.

1.06 STORAGE OF PRODUCTS

- A. Store and protect Products in accordance with manufacturer's recommendations and requirements of these Specifications.
- B. Make necessary provisions for safe storage of Products. Place Products so as to prevent damage to any part of the Work or existing facilities and to maintain free access at all times to all parts of the Work and to utility service company installations in the vicinity of the Work. Keep Products neatly and compactly stored in locations that will cause minimum inconvenience to other contractors, public travel, adjoining owners, tenants, and occupants. Arrange storage in a manner so as to provide easy access for inspection.
- C. Restrict storage to areas available on the site for storage of Products as shown on Drawings or approved by Project Manager.
- D. Provide off-site storage and protection when on-site storage is not adequate. Provide addresses of, and access to, off-site storage locations for inspection by Project Manager.
- E. Do not use lawns, grass plots, or other private property for storage purposes without written permission of owner or other person in possession or control of premises.
- F. Protect stored Products against loss or damage.
- G. Store in manufacturers' unopened containers.
- H. Neatly, safely, and compactly stack Products delivered and stored along the line of the Work to avoid inconvenience and damage to property owners and general public and maintain at least 3 feet clearance around fire hydrants. Keep public, private driveways and street crossings open.
- I. Repair or replace damaged lawns, sidewalks, streets or other improvements to satisfaction of Project Manager. Total length that Products may be distributed along route of construction at one time is 1000 linear feet, unless otherwise approved in writing by Project Manager.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01630
PRODUCT OPTIONS AND SUBSTITUTIONS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedure for requesting substitution of products in lieu of those specified. These requirements supplement Paragraph 3.10 of Documents 00700 - General Conditions and 00800- Supplementary Conditions.
- B. After submittal period expires, requests for substitutions will be considered only when a specified product becomes unavailable because of conditions beyond Contractor's control.

1.02 DEFINITIONS

- A. Process: Any proprietary method for installing products that results in an integral, functioning part of the Work. For this Section, the word "product" includes "process."

1.03 SUBMITTALS

- A. Submit 5 copies of each separate product substitution request, within time period stated in Document 00700 - General Conditions, including:
 - 1. Full submittal data for specified products, following Section 01340- Shop Drawings, Product Data and Samples.
 - 2. Full data substantiating compliance of proposed substitutions with Contract Documents and substantiating equivalency with specified products:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature with precise product description, and directly applicable performance and test data and reference standards.
 - c. Samples, as applicable.
 - d. Name and address of projects on which proposed product was used in similar or equivalent conditions within the last 3 years, and date of installation.
 - e. Name, address and telephone number of owners, designer, and installing contractor.

PRODUCT OPTIONS AND SUBSTITUTIONS

- f. For process substitutions, detailed description of proposed method and drawings illustrating methods.
- B. Detailed reason(s) for substitution, and tangible benefits accruing to City.
- C. Itemized comparison of proposed substitutions with specified products and full description of deviations.
- D. Fully describe all effects of substitutions on the Work and on separate contracts and work by City. Include full cost data comparing proposed substitution with specified products and amount of change in Contract Sum. Indicate changes in construction schedule (Section 01325 - Construction Schedules).
- E. Substitutions are not permitted when:
 - 1. They are not processed following Document 00700 - General Conditions and this Section.
 - 2. Acceptance will require revision of Contract Documents or will change the design concept.
 - 3. Delay in construction will occur.
 - 4. No provisions for substitutions are stated in the Contract Documents.
- F. Burden of proof of merit of proposed substitution remains solely with Contractor.

1.02 CONTRACTOR'S OPTIONS

- A. Options, stated as "Contractor's option(s)" in Contract Documents, are intended to benefit the Work through reduced cost, decreased construction time, or better performance within designated range of criteria.
- B. Volunteer options are not permitted.
- C. Notify in writing City Engineer of options chosen.

1.03 QUALITY ASSURANCE

- A. To the maximum extent possible, provide products of the same type or function from a single manufacturer, make, or source. Where more than one choice is available, select the product which is compatible with other products already selected, specified, or which is in use by City.

1.04 DESIGNER'S ACTIONS

- A. Decision to accept or deny proposed substitute products, or selection of one product instead of another, is solely the responsibility of Designer; such decisions and selections are final.

1.05 COSTS FOR REVIEW OF SUBSTITUTIONS

- A. Pay costs related to Designer's review and examination of proposed substitutions. Assume liability for obtaining acceptance of substitutions.
- B. Reimburse City for actual evaluation costs of Designer's(s') if proposed substitute does not meet requirements of Contract Documents, or acceptance of proposed substitute requires changes to the Work.
- C. Reimburse City for associated design costs, including redesign, additional submittal reviews, investigations, Designer's fees and revision of Contract Documents required because of the requested substitution. Design costs are the full price for additional work performed, paid at the rates established by Designer's contract with City for Design and Contract Documents phase of the Project.
- D. Pay for laboratory testing required to obtain information upon which equivalency can be determined.
- E. If Designer determines that proposed substitutions are not equivalent to specified products, furnish one of the specified products without delay in time or additional cost to City.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01725
FIELD SURVEYING

PART 1 GENERAL

1.01 QUALITY CONTROL

- A. Conform to State of Texas laws for surveys requiring licensed surveyors. Employ a surveyor acceptable to Project Manager if required by the Contract.

1.02 MEASUREMENT AND PAYMENT

A. UNIT PRICES

- 1. No separate payment will be made for field surveying. Include cost in unit price for related items.

1.03 SUBMITTALS

- A. Conform to requirements of Section 01330- Submittal Procedures.
- B. Submit name, address, and telephone number of Surveyor to Project Manager before starting survey work.
- C. Submit documentation verifying accuracy of survey work on request.
- D. Submit certificate signed by Surveyor, that elevations and locations of the Work are in conformance with the Contract

1.04 PROJECT RECORD DOCUMENTS

- A. Maintain a complete and accurate log of control and survey work as it progresses.
- B. Prepare a certified survey setting forth dimensions, locations, angles, and elevations of construction and site work upon completion of foundation walls and major site improvements.
- C. Submit record documents under provisions of Section 01785- Project Record Documents.

1.05 EXAMINATION

- A. Verify locations of survey control points prior to starting the Work.

FIELD SURVEYING

- B. Notify Project Manager immediately if any discrepancies are discovered.
- C. Verify project address with the HAS GIS Department.

1.06 SURVEY REFERENCE POINTS

- A. The City will establish survey control datum as provided in Document 00700- General Conditions and as indicated on Drawings. In m Project Manager in Advance of time horizontal and vertical control points will be established so verification deemed necessary by Project Manager may be done with minimum inconvenience to the City or Contractor.
- B. Locate and protect survey control points prior to starting site work; preserve permanent reference points during construction.
- C. Notify Project Manager a minimum of 48 hours before relocation of reference points is needed due to changes in grades or other reasons.
- D. Promptly report loss or destruction of reference points to Project Manager.
- E. Reimburse the City for cost of reestablishment of permanent reference points disturbed by construction operations.

1.07 SURVEY REQUIREMENTS

- A. Utilize recognized engineering survey practices.
- B. Establish a minimum of two permanent benchmarks on site, referenced to established control points. Record horizontal and vertical location data on Project record documents.
- C. Establish elevations, lines and levels to provide quantities required for measurement and payment and for appropriate controls for the Work. Locate and lay out the following with appropriate instruments:
 - 1. Site improvements including grading, fill and topsoil placement, utilities, and footings and slabs
 - 2. Grid or axis for structures
 - 3. Building foundation, column locations, and ground floor elevations
- D. Periodically verify layouts.

PART 2 PRODUCTS (NOT USED)

PART 3 PRODUCTS (NOT USED)

END OF SECTION

SECTION 01726
BASE FACILITY SURVEY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. “Base Facility” is defined in Section 01423 - References.
- B. Survey of Base Facility and related existing conditions.
- C. Notification of discoveries.
- D. Contractor's survey of Base Facility is intended to identify and describe actual as-found conditions to supplement information contained in Base Facility documents and in the Drawings and Specifications.
- E. Necessary changes in location of the Work may be made by City Engineer to avoid unanticipated concealed conditions, following Section 01255 - Modification Procedures.
- F. If permanent relocation or reworking of existing conditions is required and not otherwise provided for in the Contract Documents, City Engineer will direct Contractor following Section 01255 - Modification Procedures.

1.02 BASE FACILITY DOCUMENTS

- A. Drawing and Specifications for the Work are based on City-furnished Base Facility documents and upon the Designer's limited visual observations of sight-exposed conditions existing in April 2020.
 - 1. Contract Documents do not necessarily completely describe all details of Base Facility at interfaces with the Work.
 - 2. The Designer’s observations did not extend to areas or conditions above ceilings or inside partitions and chases.
- B. Obtain available Base Facility documents from the City Engineer.
 - 1. Drawing and Specifications for the Work are based on the City-furnished Base Facility documents and upon limited visual observations of sight-exposed conditions existing at the time of Notice to Proceed (NTP).

BASE FACILITY SURVEY

2. The contractor will provide HAS with a map of the project area to be used by the infrastructure and IT sections to compile a map of known underground utilities and telecommunications lines and equipment. This process does not replace any base survey methods or requirements.

1.03 SEQUENCING AND SCHEDULING

- A. Sequence and schedule survey to properly coordinate with other construction operations.
- B. Complete survey work, process one or more Document 00685 - Request for Information, obtain responses, evaluate and submit cost or schedule impact of responses, and process accepted modifications before commencing work of affected Sections.
- C. Obtain or designate and protect control samples of Base Facility work during survey and maintain until required submittals pertinent thereto are processed.

1.04 BASE FACILITY CONDITIONS

- A. Base Facility intended or required to remain takes precedence of fact and control over details and construction of interfaces, dimensions, clearances, openings, alignments, and substrate conditions between Base Facility and the Work.
- B. Base Facility is intended to remain except where shown on Drawings or specified as work of Section 01731 - Cutting and Patching or Division 2 sections covering demolition.

1.05 DIMENSIONS

- A. Control dimensions are indicated by nominal value on the Drawings within parenthesis. This designation means, in addition to other requirements, the Contractor is responsible for finding the actual dimension following this Section and using actual dimensions to govern placement of work including relationship to and coordination with related work.
 1. Follow Section 01255 - Modification Procedures to resolve discrepancies between existing conditions and Contract Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. Survey Base Facility affecting or affected by the Work by on-site examination of existing conditions.

- B. Explore ahead of trenching and excavation work to uncover obstructing underground structures sufficiently to determine location, to prevent damage and to prevent interruption of services. Restore to original condition damages to underground structure at no cost or time increase to the contract, following Section 01731 - Cutting and Patching.
- C. Note discovered discrepancies between the Base Facility and Contract Documents.
 - 1. Use one set of prints of Drawings and Specifications (made from reproducible furnished following Section 01110 - Summary of Work) for the sole purpose of documenting discoveries. Designate as "SURVEY DOCUMENTS."
 - 2. Prepare and issue Document 00685 - Request for Information for each discrepancy, following Section 01255 - Modification Procedures.
 - 3. Supplement data noted on survey documents with video or photographs following Section 01321 - Construction Photographs as required to clearly and fully describe conditions.
- D. Coordinate survey of semi-exposed and concealed conditions with work of Sections 01731- Cutting and Patching, and 02221- Demolition.

END OF SECTION

**SECTION 01731
CUTTING AND PATCHING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Obtain CSP and control samples.
- B. Repair remaining Base Facility.
- C. Connect work to Base Facility.
- D. Remove construction required to enable required alteration or addition to Base Facility.
- E. Uncover work for inspection or reinspection of covered work by authorities having jurisdiction.
- F. Connect work not done in proper sequence.
- G. Make connections or alterations to Base Facility or to work.
- H. Provide openings, channels, chases and flues as required.
- J. Replace designated panels of existing terrazzo flooring.
- K. Demolition is specified in Division 2.

1.02 REFERENCES

- A. National Terrazzo and Mosaic Association, Inc. (NTMA).

1.03 SUBMITTALS

- A. Submit Document 00931 - Request for Information, with supporting data, in advance of cutting or patching not shown on the Drawings or which affects:
 - 1. Contract Sum or Time.
 - 2. Visual quality of remaining sight-exposed surfaces exposed after work is complete and for which no work is required other than to gain access.

CUTTING AND PATCHING

3. Warrantability, value, integrity, serviceability, or life expectancy of any component of the Base Facility and the Work.
 4. Integrity or serviceability of weather-exposed, moisture-resistant, or fire-resistant components or systems.
 5. Work outside indicated contract limits.
- B. Include in each request:
1. Identification of the Project.
 2. Description of affected Work.
 3. The necessity for cutting and patching.
 4. Effect on Base Facility construction, on the Work, or on work of separate contractors and work by City.
 5. Description of proposed work:
 - a. Scope of cutting and patching.
 - b. Contractor, Subcontractor or trades executing work.
 - c. Products proposed.
 - d. Extent and type of refinishing.
 - e. Schedule of operations.
 6. Alternatives to cutting and patching, if any.
 7. Written permission of separate contractors or installers of work by City whose work will be affected, countersigned by City Engineer.
- C. Should Base Facility conditions require change of products, follow Section 01630 - Product Options and Substitutions.
- D. Submit product data and samples following Section 01340 - Shop Drawings, Product Data and Samples.
1. Submit manufacturer's technical literature for each patch material and fully describe compatibility with each substrate.

CUTTING AND PATCHING

2. Submit samples of paint colors and sheen on gypsum board with taped edges.
 3. Submit 2-foot square samples of drywall and plaster finish texture.
 4. Submit mix designs following Section 01455 - City's Acceptance Testing.
- E. Submit written notice to City Engineer designating time work will be uncovered for observation. Do not cut until authorized by City Engineer, except when documentable emergency conditions require immediate cutting.
- F. Should conditions of work or schedule indicate change of products or methods, submit Document 00931 - Request for Information stating conditions indicating change, recommendations for alternative products or methods and submittals. Follow Section 01630 - Product Options and Substitutions.

1.04 QUALITY ASSURANCE

- A. Cut and patch by persons qualified to perform work.
- B. Remove minimum construction necessary. Return surfaces to appearance of new work and match Base Facility.
1. Cut finish surfaces such as masonry, tile, plaster or metals in a straight line at a natural line or plane of division from abutting work.
- C. Make patch work visually undetectable at 5-feet for exposed and semi-exposed interior work, and at 10-feet for exposed and semi-exposed exterior work under Base Facility lighting conditions.
- D. Presence of a damaged or defective product, finish or type of construction requires patching, extending or matching be performed as necessary to make work complete and consistent to standards of quality identical to Base Facility.
- E. Promptly notify City Engineer by Document 00931 - Request for Information of discoveries of construction, such as furnishings and articles having possible historic or private value to City.
1. Protect discovery until disposition.
 2. Legally dispose of items not removed by City.

1.05 INSPECTION, HANDLING, STORAGE AND PROTECTION OF CSP AND CONTROL SAMPLES

- A. Follow Section 01610 - Basic Product Requirements and following minimum standards.

CUTTING AND PATCHING

- B. After removal CSP and control samples, inspect and tag each item. Prepare a written inventory.
 - 1. Describe damage or deficiencies discovered. Process claims and obtain replacement products.
 - 2. Inspect and inventory in presence of City Engineer if necessary.
- C. Store CSP following Section 01610 - Basic Product Requirements until delivery to City. Package CSP in weatherproof containers, labeled with inventory on outside of containers.
- D. Load, transport, off-load and provide other incidental labor required to place CSP inside City's facility. Notify City Engineer at least 7 days before delivery is scheduled.
- E. Provide CSP manufacturer's labor if required to properly handle, store and protect products.
- F. Obtain written receipt or transfer of title from City Engineer.

1.06 SCHEDULING AND SEQUENCING

- A. Provide specific time and date information to City Engineer 48 hours in advance of proposed Work involving temporary shutdown of utilities and environmental systems.
- B. Notify City Engineer at least 7 days before starting work in areas or conditions affecting data, communications, security and paging systems. Do not cut or patch such systems without approval of City Engineer.
- C. Submit a detailed schedule of proposed connections, including shutdowns and tie-ins. Include in the submittal the proposed time and date as well as the anticipated duration of the Work. Submit the detailed schedule coordinated with the construction schedule.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL PERFORMANCE

- A. In addition to demolition work, cut, move or remove discovered non-hazardous-material Base Facility items as necessary to provide access or to allow alterations and new work to proceed, as approved or directed, including:
 - 1. Repair or remove dangerous and unsanitary conditions.

CUTTING AND PATCHING

2. Remove abandoned items and items serving no useful purpose, such as Base Facility abandoned HVAC components, piping, data cables, conduit and wiring back to panels, and ductwork.
 - a. Confirm abandonment with City Engineer prior to removal.
 3. Remove unsuitable or extraneous products not designated for salvage, such as abandoned furnishings and equipment, and debris such as rotted wood, rusted metals and deteriorated concrete.
- B. Patch, repair and refinish Base Facility items intended or designated to remain, to match analogous Base Facility conditions for each product, with proper transition between new work and Base Facility.
 - C. Remove and replace defective or deficient new work and work not following Contract Documents.
 - D. Remove samples of Base Facility and work for Contractor's surveillance testing and for tests in Section 01455 - City's Acceptance Testing.
 - E. Repair damage to Base Facility resulting from work under this contract.
 - F. Perform activities to avoid interference with facility operations and work of other contractors, following Document 00700 - General Conditions and Sections 01145 - Use of Premises, 01312 - Coordination and Meetings, 01505 - Temporary Facilities and 01506 - Temporary Controls.
 - G. Restore Base Facility to a state equivalent to or better than that before cutting and patching. Restore new work to standards of these Specifications.
 - H. Support, anchor, attach, match, trim and seal materials to work of other contractors. Unless otherwise specified, provide sleeves, inserts, and hangers, required for the execution of the Work.
 - I. Provide shoring, bracing and support as required to maintain structural integrity and protect adjacent work from damage during cutting and patching. Before cutting beams or other structural members, anchors, lintels or other supports, request written instructions from City Engineer. Follow such instructions, as applicable.
 - J. Cut and patch as recommended by manufacturers of patch products, and where possible by manufacturer of affected Base Facility products.
 - K. Fit and adjust products to provide finished installation complying with specified products, functions, tolerances and finishes.

CUTTING AND PATCHING

- L. Restore Base Facility damaged as a result of the Work. Install work following Contract Documents, Base Facility documents, trade standards, or governing agencies, as applicable.
 - 1. Follow Section 01726 - Base Facility Survey to document Base Facility damage Base Facility prior to commencing work.

- M. Refinish entire exposed and semi-exposed surfaces.

- 1. For continuous surfaces, refinish to nearest change in plane. Remove and reinstall remaining signs, hardware and similar interferences.
 - 2. For an assembly, refinish entire unit.

- N. Where cutting and patching fails to match Base Facility work, provide complete replacement work.

3.02 TEMPORARY FACILITIES AND PROTECTION

- A. Follow Section 01505 - Temporary Facilities.

3.03 INSPECTION AND COORDINATION

- A. Inspect Base Facility following Section 01726 - Base Facility Survey, and if required provide Contractor's testing following Section 01450 - Contractor's Quality Control, for Base Facility conditions subject to this Section.
- B. Report by Document 00931 - Request for Information Questionable Base Facility conditions that affect the Work.
- C. Obtain written authorizations before beginning utility or environmental systems work affecting Base Facility outside the contract limits.

3.04 DAMAGED SURFACES

- A. Replace or patch any portion surfaces of the Work and Base Facility found damaged, lifted, discolored, or showing other imperfections resulting from work, with matching sound material and finish.
 - 1. Provide proper support of substrate before patching.
 - 2. Refinish patched portions of painted or coated surfaces scheduled for new finish, to produce uniform color and texture over entire surface.

- a. Tape, float, sand and apply two coats of latex paint to repaired Base Facility drywall, plaster, doors and doorframes.
3. Exceptions: Fully patch remaining Base Facility surfaces exposed and semi-exposed to public view to match all visual characteristics of Base Facility.

3.05 TRANSITION FROM BASE FACILITY TO NEW CONSTRUCTION

- A. Where new work abuts or finishes against Base Facility work, make smooth and workmanlike transition. Match patched work adjacent to Base Facility work for all visual characteristics.
 1. Where smooth transition is not possible, terminate Base Facility surface neatly along a straight line at a natural line or plane of division, and provide edge trim appropriate to substrate and finish.
 2. Exceptions: Fully patch remaining Base Facility surfaces exposed and semi-exposed to public view to match all visual characteristics of Base Facility.

3.06 SITE UTILITY AND BUILDING ENVIRONMENTAL SYSTEMS

- A. Perform work needed to complete connections and tie-ins to Base Facility. Keep Base Facility in continuous operation unless otherwise specifically permitted or approved by City Engineer.
- B. Base Facility electrical and mechanical systems and site utilities are intended to be functioning properly prior to start of the Work. Follow Section 01505 to confirm proper function.
 1. Notify City Engineer by Document 00931 - Request for Information of non-operating systems prior to commencing affected work in each area.
 2. Do not proceed with work affecting improperly functioning utilities or systems until corrective work is complete.
- C. Make required cuts, plugs and terminations. Tag remaining lines with contents names and direction of flow, whether or not flow is active, using weather-resistant tags and permanent markers.
- D. Plumbing Systems and HVAC Systems:
 1. Provide temporary or permanent by-passes, test plugs and stop valves in plumbing waste and supply lines, and in HVAC system piping as individual fixtures and equipment are removed. Do not bypass wastewater or sludge into waterways. Provide temporary pumping facilities to handle wastewater if necessary. Provide temporary power supply and piping to facilitate construction where necessary.

CUTTING AND PATCHING

- a. Scope, type and locations of temporary plugs and valves are at the Contractor's option, as approved, based on Base Facility conditions encountered.
 - b. Unless otherwise required, install permanent plugs and valves as follows:
 - 1) For risers tapped into remaining lateral lines cut and plug risers as close as practical to laterals.
 - 2) For laterals, cut and plug approximately one foot from surface of Base Facility demising walls intended to remain.
 - 3) For risers extending through floors in unoccupied areas, cut and plug approximately one foot above top surface of Base Facility floor.
 - 4) For risers extending through floors in occupied areas and which cannot be fully removed following Paragraph 1) above, cut and plug flush with surface of Base Facility floor.
- E. Electrical Power Systems:
1. Provide temporary or permanent bypasses and terminations of electrical systems. Do no work on Base Facility data, communications, security or paging systems following Paragraph 1.05.B above.
 - a. Scope, type and location of terminations are at the Contractor's option, as approved, determined by Base Facility conditions encountered.
 - b. Unless otherwise required, terminate electrical lines as follows:
 - 1) For circuits tapped into remaining laterals intended to remain and which occur above Base Facility ceiling planes, terminate circuits in approximately sized junction boxes as close as practical to the lateral. Attach boxes to building structure, install wire nuts on unconnected wires, and permanently label outside of box with panel/circuit number and voltage.
 - 2) For abandoned circuits, remove wire, conduit, boxes, breakers and related components back to the respective panel boxes or terminal boards, and provide a blank plate in the breaker slot, and identify plate as "SPARE CIRCUIT/ (CAPACITY) AMP" minimum.
 - c. Unless otherwise required by demolition work, and where Base Facility ceilings are indicated for removal, leave paging and security system components in place, using at least two hanger wires per device.
 2. Provide permanent support for risers and laterals intended to remain.

CUTTING AND PATCHING

3. Temporarily or permanently seal penetrations of removed laterals and risers through floors and full-height walls with firestopping, following demolition requirements, as work progresses.
 4. Provide minimum 20-gauge galvanized sheet metal plate with self-tapping screws at openings in ductwork. Seal joints as required to prevent air intake or exhaust.
 5. Remove site utility lines without disturbing underlying soil or sub-base.
- F. Insofar as possible, test work under operating conditions before final tie-ins are made to connect equipment to the Base Facility. Test remaining utilities and service in presence of City Engineer before covering up. Repair defects and deficiencies.
- 3.07 SALVAGING CONTROL SAMPLES AND CSP
- A. Remove Base Facility designated as CSP and control samples using methods and procedures specified herein.
 1. Control samples located outside contract limits are intended to remain in place.
 2. Remove control samples of sufficient size and proper quantity to establish standards for comparison.
 - B. Inspect, handle, store, and protect control samples and CSP following this Section. Package CSP in impact- and moisture-resistant containers.
 - C. Where applicable, reinstall control samples following this Section.
- 3.08 PAINT
- A. Prepare and prime substrates following manufacturer's recommendations.
 - B. Apply paint with equipment as required to achieve match with Base Facility. Apply at rates recommended by manufacturer.
- 3.09 INTERIM CLEANING
- A. Clean occupied areas daily. Immediately remove spillage, overspray, dust and debris in occupied areas and at points of access into contract limits. Sweep and wet mop floors as required, using safety cones and tape barricades as required cleaning operations.
 - B. Make surfaces ready for work of successive trades.

- C. At completion of work in each area, provide final cleaning following Section 01770 - Contract Closeout.

END OF SECTION

SECTION 01740
SITE RESTORATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Restoration of site affected by the Work in public or private property, including pavement, esplanades, sidewalks, driveways, fences, lawns and landscaping.

1.02 MEASUREMENT AND PAYMENT

A. Unit Prices

1. Payment for restoration of Project site disturbed by utility construction operations is on a linear foot basis. Measurement will be as provided for corresponding utility in each Specification section. No separate payment made for branch pipe, valves, and other associated work for utilities. Measurement for restoration with multiple utilities within the same right-of-way will be on a linear foot basis for only one utility.
2. No separate payment made for facility or roadway projects. Include cost in the surface improvements associated with the facility or roadway construction.
3. Payment includes required site restoration within the right-of-way or easement regardless of size or type of pipe, method of construction, paved or unpaved areas or thickness and width of pavement.
4. No separate payment made for site restoration for service connections under this Section. Include cost in appropriate utility Section.
5. Refer to Section 01270 – Measurement and Payment for Unit Price procedures.

- B. Stipulated Price (Lump Sum) Contracts. If Contract is Stipulated Price Contract, include payment for work under this Section in total Stipulated Price.

1.03 DEFINITIONS

- A. Phase: Locations identified on the plans and listed in Section 01110 – Summary of Work and Section 01326 – Construction Sequencing.
- B. Site Restoration: Replacement or reconstruction of site Improvements located in rights-of-way, easements, public property, and private property affected or altered by the Work.

SITE RESTORATION

- C. Site Improvement: Includes pavement curbs and gutters, esplanades, sidewalks, driveways, fences, lawns, irrigation systems, landscaping, and other improvements in existence at the Project site before commencement of construction operations.

1.04 SUBMITTALS

- A. Conform to requirements of Section 01330 – Submittal Procedures.
- B. Schedule of testing, service connections, abandonment, backfill, and site restoration.
- C. Sample of notices to residents outlining their responsibility for maintenance of site improvements adjacent to the Project that are not disturbed by construction operations.

1.05 SCHEDULING

- A. Schedule testing, service connections, abandonment, backfill and site restoration immediately following completion of pipe laying work or paving within each block or line segment.
- B. Phased Construction:
 - 1. Commencement of subsequent Phase(s) will follow scheduling of site restoration of prior Phase. Limit work to a maximum of two (2) Phases of the project.
- C. Construction of Project(s) with no Phases listed in Section 01110 – Summary of Work:
 - 1. Complete site restoration prior to disturbing over 50% of total project linear feet or 2,000 linear feet, whichever is greater, of right-of-way or easement.
 - 2. Limit work to a maximum of 50% of total project linear feet or 2,000 linear feet, whichever is greater, of right-of-way or easement. Commence work in additional right-of-way or easement after completion of site restoration.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Pavement, Sidewalks, and Driveways: Materials specified in Section 02951 – Pavement Repair and Resurfacing.
- B. Seeding and Sodding: Sod specified in Section 02922 – Sodding and Seed specified in Section 02921 – Hydro-Mulch Seeding.
- C. Trees, Shrubs and Planting: Conform to requirement in Section 01562 – Tree and Plant Protection.

PART 3 EXECUTION

3.01 PREPATORY WORK

- A. Provide cleanup and restoration crews to work closely behind pipe laying and roadway construction crews, and where necessary, during testing, service restoration, abandonment, backfill and surface restoration.
- B. Water Lines: Unless otherwise approved by Project Manager, comply with the following:
 - 1. Once Project Manager approves work within a Phase, immediately begin preparatory work for disinfection effort.
 - 2. No later than three (3) days after completing disinfection preparatory work, submit to City appropriate request for disinfection.
 - 3. If City fails to perform initial disinfection of lines in accordance with Section 02514 – Disinfection of Water Lines, within seven (7) days from submission of appropriate request, and if approved by Project Manager, pipe laying operations may continue beyond approved limits until the City responds.
 - 4. Immediately after transfer of services, begin abandonment of old water lines and site restoration.
- C. Wastewater Lines:
 - 1. Once Project Manager approves work within a Line Segment, immediately begin preparatory work for testing effort.
 - 2. No later than three (3) days after completing preparatory work for testing, initiate testing work.
 - 3. Immediately after transfer of service connections, begin abandonment of old wastewater lines, and site restorations.
- D. Street Construction and Paving Projects:
 - 1. Once Project Manager approves work within a Line Segment or Block, immediately begin preparatory work for testing effort.
 - 2. No later than three (3) days after completing preparatory work for testing, initiate testing work.
 - 3. Immediately after testing, begin site restoration.
- E. Street Construction and Paving Projects:

SITE RESTORATION

1. Once Project Manager approves work within a Block, immediately begin preparatory work for sidewalk construction, sodding and hydro-mulching and tree planting.
2. No later than seven (7) days after completing preparatory work, initiate construction.

3.02 CLEANING

- A. Remove debris and trash to maintain a clean and orderly site in accordance with requirements of General Conditions and Section 01576 Waste Material Disposal.

3.03 LANDSCAPING AND FENCES

A. Seeding and Sodding.

1. Remove construction debris and level area with bank sand so that new grass surface matches level of existing grass and maintains preconstruction drainage patterns. Level and fill minor ruts or depressions caused by construction operations with bank sand, where grass is still viable.
2. Restore previously existing turfed areas with sod and fertilize in accordance with Section 02922 Sodding. Sod to match existing turf.
3. Restore unpaved areas not requiring sodding with hydro-mulch seeding conforming to Section 02921 – Hydro-Mulch Seeding.

B. Trees, Shrubbery and Plants.

1. Remove and replant trees, shrubs, and plants in accordance with Section 01562 – Tree and Plant Protection.

C. Fence Replacement.

1. Replace removed or damaged fencing to equal or better condition than existed prior to construction, including concrete footing and mow strips. Provide new wood posts, top and bottom railings and panels. Metal fencing material, not damaged by the Work, may be reused.
2. Remove and dispose of damaged or substandard material.

3.04 MAINTENANCE

- A. Maintain shrubs, plantings and seeded or sodded areas.
- B. Replace shrubs, plantings and seeded or sodded areas that fail to become established.

- C. Refer to Section 01562 – Tree and Plant Protection, Section 02921 – Hydro-Mulch Seeding, and Section 02922 – Sodding for Maintenance Requirements.

END OF SECTION

SECTION 01761
PROTECTION OF EXISTING SERVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements to protect existing services and minimize impact of interruptions.

1.02 DEFINITIONS:

- A. Service is defined to include utilities (natural gas, water, or power); lighting and emergency lighting; data and telecommunications; closed-circuit video, control and monitoring circuits, and air conditioning, heating, and ventilating. Service types include:

1. Power.
2. Lighting, and emergency lighting.
3. Paging.
4. Telephone.
5. Video.
6. Data and computer networks.
7. Water.
8. Natural gas.
9. Heating, ventilating, and air conditioning

- B. Data and Telecom Service is defined to include:

1. Wiring and cable used for the transmission of data, voice, or video information.
2. Wiring for low voltage monitoring and control of various types of devices.

- C. Service interruption is defined to include any temporary or permanent inability to provide the service as contracted or as intended and includes interference with or disruption to source, distribution, or terminal items of a service system.

PROTECTION OF EXISTING SERVICES

- D. Response time is defined to be the time elapsed between the time that a Service Interruption becomes known to the Contractor and the time that a person is at the site of the interruption or, if the site of the interruption is not immediately known, at the job site to diagnose and locate the service interruption.

1.03 PERFORMANCE REQUIREMENTS

- A. Contractor is required to protect and maintain existing services to those operating areas of the Airport.
 - 1. Where services are affected by construction activities and interruption of service is required to complete the Work, schedule service interruption to minimize impact.
 - 2. Where services cannot be interrupted, provide alternate services or circuits as required to maintain affected services. Design and implement service "cut-over" so that services are maintained without interruption.
- B. Train employees and subcontractors to ensure that accidental service interruptions are promptly recognized, and appropriate responses can be initiated.
- C. Maintain personnel, equipment, and parts at hand or on call to provide the response times indicated.
- D. Interruptions to Existing Service are classified as follows:
 - 1. Security Service Interruption:
 - a. Any service interruption of power, lighting, or data and telecom service that affects and compromises one of the following:
 - (1) FAA Security
 - (2) Airline Security
 - (3) Airport Security
 - (4) Other government entity charged with enforcing security at the Airport (Houston Police Department, FBI, Secret Service, etc.).
 - b. Security Services must be active at all times.
 - 2. Life Safety Service Interruption:
 - a. Any service interruption of power, lighting, or data and telecom service affecting or compromising one or more of the following life safety systems.

- (1) Fire/smoke alarms.
- (2) Emergency lighting.
- (3) Elevator operations in "Fire" mode.
- (4) Emergency intercom systems.

b. Life Safety Services must be active at all times.

3. Business Service Interruption:

a. Any service interruption of utility service (power, lighting, natural gas, data and telecom, etc.) that affects and compromises the ability of a profit-seeking entity to earn revenue, including:

- (1) Airline: Includes FIDS network, reservation/confirmation systems, paging systems.
- (2) Tenants Other Than Airlines: Point of sale systems, reservation/confirmation systems, utilities for storing, cooking, or maintaining food for sale to the public.

b. Business Services must be active at all times in the areas of the Airport served by Airlines or other tenants during hours of their operation.

4. Comfort / Convenience Service Interruption :

a. Any service interruption of power, lighting, or data and telecom services affecting or compromising the comfort or convenience of those using the Airport (passengers, visitors, employees, concessionaires, etc.) including:

- (1) Lighting.
- (2) Air Conditioning.
- (3) Heating.
- (4) Public telephones.
- (5) Elevators.

b. Minimize Comfort/Convenience Service Interruptions except in construction areas.

1.04 SUBMITTALS

A. Schedule of service interruptions.

PROTECTION OF EXISTING SERVICES

- B. Emergency Response Plan.

1.05 QUALITY ASSURANCE

- A. Develop emergency response plan for each class of service interruption indicated. Notify other contractors responsible for services and obtain contact information. Where possible, obtain written instructions for emergency repairs from the contractor responsible for each service. Where required, arrange for contractor personnel to be available to meet required response times.

1.06 COORDINATION AND SEQUENCING

- A. Schedule and execute construction activities to prevent service interruption or, where service interruption is required to complete the Work, minimize service interruption.

1.07 SCHEDULING

- A. Follow Section 01325.
- B. Develop a schedule of required service interruptions. Coordinate with the schedules required by Section 01325 and revise as required by the City or project conditions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CONTRACTOR RESPONSIBILITIES:

- A. Follow Section 01726.
- B. Scheduled Service Interruptions: Notify the City Engineer in writing not less than 7 days in advance of a scheduled service interruption. Use the attached form and include the following information in addition to the information required on the form:
 - 1. Type and classification of service.
 - 2. Location.
 - 3. Area(s) affected.
 - 4. Entities affected.
 - 5. Expected duration.
- C. Complete a Work Area Notification form for any/all service interruptions and/or

- D. **Unscheduled Service Interruptions to Data and Telecom Service:**
1. *Immediately notify HOU 24-Hour Emergency Dispatch Service at (713) 641-4000. Do not attempt to repair these lines. Include the following information:*
 - a. Location.
 - b. Area(s) affected.
 - c. Type and classification of service (if known).
 - d. Entities affected (if known).
 2. In addition to the notification requirements above, immediately notify the City Engineer of interruption.
- E. **Unscheduled Service Interruptions to Service Other Than Data and Telecom Service:**
1. When executing Work in an area known to have existing services, maintain on-site or on-call capability to initiate repairs to unscheduled service interruptions within the response times required.
 2. Immediately notify the City Engineer of interruption.
 - a. Location.
 - b. Area(s) affected.
 - c. Type and classification of service (if known).
 - d. Entities affected (if known).
 3. **Response Times to Interruptions to Existing Service:**
 - a. Security Service Interruption: 15 minutes.
 - b. Life Safety Service Interruption: 15 minutes.
 - c. Business Service Interruption:
 - (1) Service Interruptions to Airlines: 15 minutes.
 - (2) Service Interruptions to Tenants other than Airlines: 1 hour.
 - d. Comfort/Convenience Service Interruption: 1 hour.

END OF SECTION

SECTION 01770
CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittal of Operation and Maintenance (O & M) manual, lien releases, record documents, badges, and keys.
- B. O & M manual format and contents.
- C. Final cleaning. Interim cleaning is specified in Section 01505.
- D. Systems demonstrations and personnel training.
- E. Notification of Substantial Completion.
- F. Contractor's punch list.
- G. Record of the Work.
- H. Forwarding of Contractor-Salvaged products (CSP), and extra products.

1.02 SUBMITTALS

- A. Two weeks before Substantial Completion inspection, submit 2 sets of Preliminary O & M manual (Paragraph 1.03), 1 copy to Designer and 1 copy direct to City Engineer.
- B. Subsequent to Preliminary O & M manual submittal and precedent to final Certificate for Payment, submit the following:
 - 1. The Contractor shall submit Preliminary O&M Manuals to the City for review and acceptance a minimum of 60 calendar days prior to starting the commissioning process.
 - 2. Release or Waiver of Liens and consents of sureties following Documents 00700-General Conditions and 00800 - Supplementary Conditions.
 - 3. BIM As-Built and BIM Record Documents
 - a. Provide the final coordinated trade construction as-built and/or fabrication models in native format, to the City at regular intervals at the end of the Construction Phase that will have incorporated all addenda, approved Change Orders, and the

PROTECTION OF EXISTING SERVICES

modifications and deliver the final record model to the City as part of the project close-out documents.

- b. The format of the delivered documents shall consist of:
 - 1) PDF files of drawings and specifications.
 - 2) HAS approved AutoCAD version of drawings.
 - 3) Native formats of the BIM model including HAS approved Revit version.
 - 4) HAS approved version of Navisworks files and Civi3D
 - 5) All information, drawings and manuals should conform with HAS approved BIM standards and BPxP.
- 4. File organization, File directory structure, Sheet Borders, titles, method of delivery and other specifications should be in conform to HAS CAD/GIS Data Standards and HAS BIM Standards, available in www.fly2houston.com/tip.
- 5. Security identification badges.
- 6. Construction and other master keys.

1.03 O&M MANUAL CONTENTS AND FORMAT

- A. Provide O & M Manual with full information to allow matching products under future contracts to products under this contract, and to allow City to operate, maintain and repair (for user-serviceable aspects) products, including trade names, model or type numbers, colors dimensions, and other physical characteristics.
- B. Electronic Format:
 - 1. Submit in searchable PDF to reflect 8.5” x 11” inch page and margins shall be formatted for double-sided print out or copy. Large format shall be pre-approved by the City.
 - 2. Sections within the O & M Manual shall also be formatted to reflect dividers if a printout copy is desired.
 - 3. Cover of the O& M Manual shall be titled “OPERATION AND MAINTENANCE MANUAL, title of project and subject matter and “Number _ of _ if multiple volumes are developed. Include the City’s Project Number and AIP/CIP Number.
- C. Contents:
 - 1. Table of Contents for each volume, naming each Part.

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2. Part 1: Directory with name, address, and telephone number of Designer, Contractor, and Subcontractors and Suppliers for each Project Manual Section.
3. Part 2: Operation and maintenance instructions, arranged by Project Manual Section number where practical, and where not, by system. Include:
 - a. For finish materials, maintenance instructions prepared by manufacturers, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
 - b. Utility, door and window hardware, HVAC, plumbing and electrical products, prepared by product manufacturer, including:
 - 1) Product design criteria, functions, normal operating characteristics, and limiting conditions.
 - 2) Assembly, installation, alignment, adjustment, checking instructions, and troubleshooting guide.
 - 3) Operating instructions for start-up, normal operation, regulation and control, normal shutdown, and emergency shutdown.
 - 4) Lubrication and detailed maintenance instructions; detailed drawings giving location of each maintainable part and lubrication point and detailed instructions on disassembly and reassembly of products.
 - 5) Spare parts list for operating products, prepared by manufacturers, including detailed drawings giving location of each maintainable part; describe predicted life of parts subject to wear, lists of spares recommended for user-service inventory, and nearest source of in-stock spares.
 - 6) Outline, cross-section, and assembly drawings; engineering data; wiring diagrams.
 - 7) Test data and performance curves.
4. Part 3: Project documents and certificates, including:
 - a. Shop drawings, product data, and where practical, samples.
 - b. Air and water balance reports.
 - c. Certificates of occupancy or use.
 - d. Product certifications and mix designs.

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- e. Material Safety Data Sheets.
- 5. Part 4: Copy (not original) of each warranty form containing language of final warranty.
- 6. Part 5: Meeting notes from systems demonstrations.
- 7. Revise content and arrangement of preliminary Manual until approval by City Engineer.

1.04 FINAL CLEANING

- A. Execute final cleaning prior to Substantial Completion [of each Stage].
- B. Clean surfaces exposed to view; remove temporary labels and protective coverings, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to sanitary condition. Clean permanent filters and install new replaceable filters at equipment. Clean HVAC diffusers.
- C. Remove and legally dispose of waste and surplus products and rubbish, including from roofs, gutters, downspouts, drainage systems, pavements, lawn and landscaped areas, and elsewhere from site.
- D. Sweep streets and parking areas, rake lawn and landscaped areas.
- E. Wash roofs, opaque building walls and sidewalks.
- F. Remove temporary facilities and controls.
- G. Leave premises in spotless condition, requiring no further cleaning of construction by City.
- H. Adjust products to proper operating condition.
- I. Correct defective function of products.

1.05 SYSTEMS DEMONSTRATIONS AND PERSONNEL TRAINING

- A. Demonstrate proper operation and maintenance of each product to City's maintenance personnel precedent to Substantial Completion inspection.
 - 1. Operate HVAC, plumbing, and electrical systems 7 continuous days precedent to personnel training.
- B. Precedent to submittal of O & M Manual, train City's maintenance personnel in proper operation, adjustment, and maintenance of products and systems, using the preliminary O

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& M Manual as the basis of instruction. Continue training until City's personnel demonstrate proper knowledge and skills.

- C. Take minutes of meetings, including sign-in sheet, and record subjects covered in each session. Bind minutes in O&M Manual.

1.06 NOTIFICATION OF SUBSTANTIAL COMPLETION

- A. When Contractor considers the Work (or a designated portion or stage thereof identified in Section 01326 - Construction Sequencing) substantially complete, submit written notice and Punchlist (Paragraph 1.04) to City Engineer.

- 1. Do not claim Substantial Completion until authorities having jurisdiction issue certificates of occupancy or use and related inspections affirming compliance.

- 2. Attach copy of each certificate to Substantial Completion form.

- B. Within a reasonable time after receipt of certificates, an inspection will be made by City Engineer and Designer to determine status of completion.

- C. Should the Work be determined by City Engineer as not substantially complete as a result of any Substantial Completion inspection, Contractor will be notified in writing.

- 1. Remedy deficiencies.

- 2. Send written notice of Substantial Completion as above.

- 3. City Engineer and Designer will reinspect the Work.

- 4. Pay costs of Designer's second and subsequent Substantial Completion inspections, by Change Order.

- D. When the Work is determined as substantially complete, the Certificate of Substantial Completion will be executed.

1.07 CONTRACTOR'S PUNCHLIST

- A. Prior to and in connection with Substantial Completion procedures, prepare a written Punchlist on a [room-by-room] [area-by-area] basis [for each stage] and as follows:

- 1. Designer will provide one reproducible copy of then-current floor plans. These drawings are the basis of Contractor's Punchlist.

- 2. Inspect the Work and mark applicable comments on the floor plans. Prepare written notes as required to supplement notes made on drawings.

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3. Continue completion of the Work including Punchlist items, marking off completed items.
 4. Forward 3 diazo prints of the annotated Drawings to City Engineer accompanied by notification that Substantial Completion Inspection is ready.
- B. Schedule Punchlist Inspection and other closeout inspections through City Engineer.
- C. Punchlist inspection will be attended by the following as a minimum:
1. Contractor, Contractor's Superintendent, and applicable Subcontractors' superintendents. Attend with Punchlist drawing.
 2. City Engineer.
 3. Designer.
 4. Others of City Engineer's choice.
- D. Substantial Completion inspection will be made during one or more mutually agreed times to inspect the Work, to review and amend Contractor's Punchlist. If the work is substantially complete, Document 00645 - Certificate of Substantial Completion will be executed.
1. Amendments to the Contractor's Punchlist will be made on the reproducible.
 2. Within 5 days of execution of Document 00645, provide 4 copies of the amended Punch List and original Document 00645 to City Engineer.
- E. Expeditiously correct work.
- F. Process each reinspection as above and in Paragraph 1.04.
- G. Punchlist items and corrections required after execution of Document 00650 - Certificate of Final Completion will be processed as warranty work following Document 00700 - General Conditions, Paragraph 3.12.
- 1.08 RECORD OF THE WORK
- A. Following requirements expand Paragraph 3.16 of Documents 00700 - General Conditions and 00800 - Supplementary Conditions.
- B. Record information concurrently with construction progress. Do not conceal work until required information is recorded.

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- C. Keep in a secure location in the [field office (Section 01505- Temporary Facilities) at the site] [Contractor's office] and timely record the Work as actually built as the Work progresses.
1. Contractor shall maintain one full size set of Construction Documents and one set of the Project Manual(s) in the Contractor's Field office. In addition, the Contractor shall maintain one record set of submittal data, video and photographic data, and other record data as required by to support and supplement record changes made on Drawings and the Project Manual(s).
 2. Legibly note variations from Contract Documents on Drawings, Project Manual and submittal data, whichever most clearly shows the change.
 3. Clearly mark each document in red ink "RECORD OF THE WORK. Use only for recording field deviations and actual constructed conditions and arrangements."
- D. Keep documents current and make available for inspection by City Engineer.
- E. Show following minimum information, as applicable to type of work, marked in fine-point red ink:
1. Measured depths of foundation elements in relation to finish first floor datum.
 2. Measured horizontal locations and elevations of underground utilities and appurtenances, referenced to permanent surface improvements.
 3. Elevations of underground utilities referenced to City's benchmark utilized for project.
 4. Measured locations of internal utilities, environmental systems and appurtenances concealed in construction, referenced to visible and accessible features of construction.
 5. Field changes of dimension and detail.
 6. Changes made by RFI (Document 00931).
 7. Changes made by Modifications.
 8. Details not on original Contract Documents.
 9. References to related shop drawings, product data, samples, RFIs and Modifications.
- F. Upon completion of the Work, collect diazo prints of marked-up Drawings, one single-sided copy of marked-up Project Manual, one set of shop drawings (including diskettes of CADD files prepared as part of the Contract, such as data required by Section 01340- Shop Drawings, Product Data and Samples), one original set of product data (Section 01340), one set of RFIs, one set of Modifications, one set of originals of video tapes and one copy of photographs (Section 01321 - Construction Photographs), and other required documents.

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1. Clearly mark each document, immediately adjacent to the "RECORD OF THE WORK" mark, in red ink thus:

"CERTIFIED AS THE CORRECT AND COMPLETE RECORD OF WORK PERFORMED.

_____ (Contractor Firm Name)
_____ (Authorized Signature)
_____ (Date)

- G. Transmit all records to City Engineer.
- H. Transmit reproducible copies of Drawings (see Section 01110 - Summary of Work) to City Engineer.
- I. Submit proper record of the Work, in addition to other requirements in the Contract Documents, precedent to City Engineer's authorization for release of final payment.

1.09 FORWARDING CSP AND EXTRA PRODUCTS

- A. Before submitting final application for payment, forward remaining proper CSP (Section 01110 - Summary of Work), extra products, including spare parts (specified in other Sections) to location designated by City Engineer.
- B. Furnish pallets and containers as required for proper product storage.
- C. Unload products from Contractor's vehicles. Place pallets, containers and products as directed by City Engineer.
- D. Obtain written transfer of title or receipt.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PROTECTION OF EXISTING SERVICES

**SECTION 01782
OPERATIONS AND MAINTENANCE DATA**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittal requirements for equipment and facility Operations and Maintenance (O&M) Manuals

1.02 MEASUREMENT AND PAYMENT

- A. Measurement for equipment O&M Manuals is on a lump sum basis equal to five percent of the individual equipment value contained in Schedule of Unit Prices or Schedule of Values. The lump sum amount may be included in the first Progress Payment following approval of the O&M Manuals by Project Manager.

1.03 SUBMITTALS

- A. Conform to requirements of Section 01330 - Submittal Procedures. Submit a list of O&M Manuals and parts manuals for equipment to be incorporated into the Work.
- B. Submit documents with 8-1/2 x 11-inch text pages, bound in 3-ring/D binders with durable plastic covers.
- C. Print "OPERATION AND MAINTENANCE INSTRUCTIONS", Project name, and subject matter of binder on covers when multiple binders are required.
- D. Subdivide contents with permanent page dividers, logically organized according to the Table of Contents, with tab titling clearly printed under reinforced laminated plastic tabs.
- E. O&M Manual contents: Prepare a Table of Contents for each volume, with each Product or system description identified.
 - 1. Part 1 - Directory: Listing of names, addresses, and telephone numbers of Design Consultant, Contractor, Subcontractors, and major equipment Suppliers.
 - 2. Part 2 - O&M instructions arranged by system. For each category, identify names, addresses, and telephone numbers of Subcontractors and Suppliers and include the following:
 - a. Significant design criteria.
 - b. List of equipment.

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- c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
3. Part 3 -Project documents and certificates including:
- a. Shop Drawings and relevant data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties.
- F. Submit two copies of O&M Manuals and parts manuals, for review, within one month prior to placing the equipment or facility in service.
- G. Submit one copy of completed volumes in final form 10 days prior to final inspection. One copy with Project Manager comments will be returned after final inspection. Revise content of documents based on Project Manager's comments prior to final submittal.
- H. Revise and resubmit three final volumes within 10 days after final inspection.
- 1.04 EQUIPMENT O&M DATA
- A. Furnish O&M Manuals prepared by manufacturers for all equipment. Manuals must contain, as a minimum, the following:
- 1. Equipment functions, normal operating characteristics, and limiting conditions.
 - 2. Assembly, Installation, alignment, adjustment, and checking instructions.
 - 3. Operating instructions for start-up, normal operation, regulation and control, normal shutdown, and emergency shutdown.
 - 4. Detailed drawings showing the location of each maintainable part and lubrication point with detailed instructions on disassembly and reassembly of the equipment.
 - 5. Troubleshooting guide.

6. Spare parts list, predicted life of parts subject to wear, lists of spare parts recommended to be on hand for both initial start-up and for normal operating inventory, and local or nearest source of spare parts availability.
 7. Outline, cross-section, and assembly drawings with engineering data and wiring diagrams.
 8. Test data and performance curves.
- B. Furnish parts manuals for all equipment, prepared by the equipment manufacturer, which contain, as a minimum, the following:
1. Detailed drawings giving the location of each maintainable part.
 2. Spare parts list with predicted life of parts subject to wear, lists of spare parts recommended on hand for both initial start-up and for normal operating inventory, and local or nearest source of spare parts availability.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01785
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Maintenance and submittal of record documents and Samples.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Maintain one record copy of documents at the site in accordance with Document 00700 - General Conditions,
- B. Store record documents and Samples in field office, if a field office is required by the Contract, or in a secure location. Provide files, racks, and secure storage for record documents and Samples.
- C. Label each document "PROJECT RECORD" in neat, large, printed letters.
- D. Maintain record documents in a clean, dry, and legible condition. Do not use record documents for construction purposes. Do not use permit drawings to record Modifications to the Work.
- E. Keep record documents and Samples available for inspection by Project Manager.
- F. Bring record documents to progress review meetings for viewing by Project Manager and, if applicable, Design Consultant.

1.03 RECORDING

- A. Record information legibly with red ink pen on a set of blue-line opaque drawings, concurrently with construction progress. Maintain an instrument on site at all times for measuring elevations accurately. Do not conceal work until required information is recorded
- B. Contract Drawings and Shop Drawings: Mark each item to record completed Modifications, or when minor deviations exist, the actual construction including:
 - 1. Measured depths of elements of foundation in relation to finish first floor datum.
 - 2. Measured horizontal locations and elevations of Underground Facilities and appurtenances, referenced to permanent surface improvements.
 - 3. Elevations of Underground Facilities referenced to City of Houston benchmark utilized for the Work.

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4. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 5. Dimensions and details of field changes.
 6. Changes made by Modifications.
 7. Details not on original Drawings.
 8. References to related Shop Drawings and Modifications.
- C. Survey all joints of water mains at the time of construction. Record on Drawings, water main invert elevation, elevation top of manway, and centerline horizontal location relative to baseline.
- D. For large diameter water mains, mark specifications and addenda to record:
1. Manufacturer, trade name, catalog number and Supplier of each Product actually installed.
 2. Changes made by Modification or field order.
 3. Other matters not originally specified.
- E. Annotate Shop Drawings to record changes made after review.

1.04 SUBMITTALS

- A. At closeout of the Contract, deliver Project record documents to Project Manager.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION