U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CENTRAL SERVICE AREA
TERMINAL ENGINEERING SERVICES
FORT WORTH, TEXAS

PROJECT SPECIFICATIONS

Replace or Refurbish the Parking Lot/ Concrete Sidewalk
JCN 22001277

Abilene Regional Airport (ABI) ATCT
2925 Lance Drive
Abilene, TX 79602

January 27, 2023

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ASPHALT PAVEMENT REPAIRS
ABILENE (ABI) AIR TRAFFIC CONTROL TOWER
ABILENE, TEXAS

CONSTRUCTION DOCUMENTS

FEDERAL AVIATION ADMINISTRATION
10101 HILLWOOD PARKWAY
FORT WORTH, TEXAS 76177

PREPARED BY:

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HOUSTON, TEXAS
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DOCUMENT 00 01 10

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SUPPLEMENTAL INFORMATION TO BIDDERS

PART ONE - GENERAL

1.01 GENERAL:

A. The following data is presented for informative purposes only. The description of the construction listed was obtained from available project drawings for the facility. The conditions described may not be representative of the entire area. The Contractor is responsible for verifying all field conditions that may impact both the bid or the proposed manufacturer's requirements.

1.02 EXISTING CONSTRUCTION SUMMARY:

A. The existing construction described on Project Drawings consists of the following:
   1. Existing Asphalt Pavement Construction: 2-inch hot mix asphaltic concrete over 10-inch flexible base course over 6-inch lime-stabilized subgrade.
   2. Existing Sidewalk Construction: 4-inch thick Portland cement concrete reinforced with 6 x 6 x 1.4 x 1.4 steel wire mesh. Joint spacing is 5-feet maximum. Sidewalks are constructed over 6-inch lime stabilized subgrade.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

Not Used.

END OF DOCUMENT 00 31 19

SECTION 01 10 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Work covered by the Contract Documents.
2. Use of premises.
3. Owner's occupancy requirements.
4. Work restrictions.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Replace or Refurbish the Parking Lot/ Concrete Sidewalk

1. Project Location: Abilene Regional Airport (ABI) ATCT, 2925 Lance Drive Abilene, TX 79602

2. Owner's Representative: FAA Resident Engineer/COR
   a. All work performed and all materials and equipment used are subject to approval by the “Contracting Officer Representative” (COR). The drawings make reference to “Resident Engineer” (RE), which is equivalent to COR/RE.

B. The Work includes (but not limited to):

1. REMOVE EXISTING ASPHALT PAVING IN SELECT AREAS THAT ARE DAMAGED OR DEPRESSED TO THE FULL DEPTH OF THE ASPHALT PAVEMENT, REPAIR THE BASE COURSE AS NEEDED, AND PERFORM HOT ASPHALT MIX REPAIRS FLUSH WITH THE ADJACENT ASPHALT PAVING.

2. CLEAN AND SEAL CRACKS IN THE EXISTING ASPHALT PAVEMENT WITH HOT ASPHALT SEALANT.

3. REMOVE EXISTING PRECAST CONCRETE WHEEL STOPS DURING THE PAVEMENT REPAIRS, AND REINSTALL AFTER THE COMPLETION OF THE REPAIRS, REPLACE WHEEL STOPS BROKEN OR DAMAGED DURING REMOVAL AND REINSTALLATION.

4. APPLY AN ASPHALT EMULSION SEAL COAT TO THE EXISTING ASPHALT PAVING.

5. APPLY NEW PAVEMENT STRIPING, MARKINGS, AND SYMBOLS.

6. DEMOLISH AND REPLACE DETERIORATED CONCRETE SIDEWALKS.

7. REMOVE EXISTING SEALANT, AND RESEAL ALL JOINTS BETWEEN NEW CONCRETE SIDEWALKS AND EXISTING CONCRETE SIDEWALKS, CONTROL JOINTS IN THE EXISTING SIDEWALKS, AND JOINTS BETWEEN CURBS AND NEW AND EXISTING SIDEWALKS.

8. FURNISH AND INSTALL A BLUE-COLORED REFLECTORIZED PAVEMENT MARKER TO DELINEATE EXISTING FIRE HYDRANT.

9. REMOVE AND REPLACE PARKING SIGNS.

10. PERFORM CEMENTITIOUS MORTAR REPAIRS IN DRAIN TROUGH INLET.

11. PROVIDE SPECIFIED MANUFACTURER AND CONTRACTOR WARRANTIES.

C. Drawing Convention – All drawings dimensions, equipment, utility piping/cabling, and penetration size, quantity and location presented on the drawing are for informational purposes only and must be field verified by the Contractor.

D. Contractor is responsible for verifying all field conditions, dimentions that may impact both the bid and the proposed manufacturer's requirements.

1.3 PROTECTION:

A. Upon beginning work on the existing facility, Contractor shall patch and protect existing pavement, wheel stop, sidewalks, fencing, gates, and landscaping as required.

B. Contractor shall have at the work site a sufficient amount of repair materials to miscellaneous repairs to the asphalt paving and concrete sidewalks.

1.4 USE OF PREMISES

A. General: Contractor shall have limited and restricted use of the premises for construction operations as indicated by FAA COR/RE in coordination with Facility Operations personnel.

B. Store materials and equipment off site except for minor amounts of material which may be stored at designated staging area as approved by FAA COR/RE in coordination with Facility Operations personnel.

1.5 OWNER'S OCCUPANCY REQUIREMENTS

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

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

1.6 WORK RESTRICTIONS

A. Duration for this project is **90 calendar days.** The contractor shall complete this project, including final clean-up of the premises and storage and equipment areas within this duration. This shall include operational testing of systems.

B. Work Hours:

Regular Work Hours: Monday – Thursday from 0700 - 1730

Notify the COR 48 hours in advance of any changes in work hours, shift changes, or anticipated overtime work.

C. Holiday Work Hours: The Contractor shall observe all federal holidays and weekends. No work shall be planned for these days unless approved in writing by the Contracting Officer.

D. No Work Moratoriums: There shall be no work done during the FAA Moratoriums unless a waiver has been granted. Coordinate with local SSC or RE/COR for dates/times of moratoriums.

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

1. Notify the FAA Resident Engineer 72 Hours prior to propose utility interruptions or outage.
2. Do not proceed with utility interruptions without the FAA Resident Engineer written permission.

F. Site Access and Security:

1. Access to the site shall be determined by the COR/RE through coordination with ABI SSC personnel and will be given to the Contractor at the Pre-Construction Meeting. The Contractor shall maintain the security integrity of the ABI ATCT premises.

G. SECURITY INVESTIGATION:
1. Contractor's personnel may have a security investigation by the FAA. Upon request by the Resident Engineer, the contractor shall promptly complete all security forms provided the by Resident Engineer.

H. Weather Delay:
1. The Contractor shall obtain the approval of the COR/RE each day prior to beginning the next day's work activity. The COR/RE may suspend all work activity in the event that outdoor weather conditions pose a threat of damage to the site, the equipment or the building.

I. Construction Safety:
1. The Contractor is responsible for providing a safe work environment for all construction and inspection personal working on site.The Contractor shall follow all national, state, and local safety procedures mandated by OSHA, law, and local ordinance.
2. The Contractor is responsible for adhering to all EOSH recommendations see (Attachments 1-4).

J. RIGHT TO SEARCH:

1. Current procedures at FAA facilities include the "right to search." If in the judgment of the FAA, a reason to search a vehicle or person exists, such search will be made.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 01 21 00

ALLOWANCES

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Include allowances stated in Contract Documents in the contract sum.
B. Designate delivery dates for Products specified under each allowance in the construction progress schedule.
C. Designate quantities of materials required under each unit cost allowance in the Schedule of Values.

1.02 ALLOWANCES FOR PRODUCTS:

A. Amount of Each Allowance Includes:
   1. Cost of product to Contractor or Subcontractor, less any applicable trade discounts.
   2. Delivery to site.
   3. Labor required under allowance, except when labor is specified to not be included in allowance.
B. In addition to amount of each allowance, include in contract sum Contractor's costs for:
   1. Handling at site, including unloading, uncrating, and storage.
   2. Protection from elements and from damage.
   3. Labor for installation and finishing where labor is specified to not be a part of allowance.
   4. Other expenses required to complete installation.
   5. Contractor's and Subcontractor's overhead and profit.

1.03 SELECTION OF PRODUCTS UNDER ALLOWANCES:

A. Project Engineer’s Duties:
   1. Consult with Contractor in consideration of Products and suppliers or installers.
   2. Maintain log of unit pricing allowances and quantities.
   3. Make selection in consultation with Owner. Obtain Owner's written decision, designating:
      a. Product, model, and finish.
      b. Accessories and attachments.
      c. Supplier and installer, as applicable.
      d. Cost to Contractor, delivered to site or installed, as applicable.
      e. Manufacturer's Warranties.
B. Transmit Owner's decision to Contractor.
   1. Prepare Change Orders as required.
C. Contractor's Duties:
   1. Assist COR/RE and Owner in determining qualified suppliers or installers.
   2. Obtain proposals from suppliers and installers when requested by COR/ RE.

3. Make appropriate recommendations for consideration of COR/RE.
4. Notify Project COR/RE of:
   a. Any reasonable objections Contractor may have against any supplier or party under consideration for installation.
   b. Any effect on Construction Schedule anticipated by selections under consideration.

1.04 CONTRACTOR RESPONSIBILITY FOR PURCHASE, DELIVERY, AND INSTALLATION:

A. On notification of selection, execute purchase agreement with designated supplier.
B. Arrange for and process Shop Drawings, Product Data, and Samples, as required.
C. Make arrangements for delivery.
D. Upon delivery, promptly inspect products for damage or defects.
E. Submit claims for transportation damage.
F. Install and finish products in compliance with requirements of referenced Specification Sections.

1.05 ADJUSTMENT OF COSTS:

A. Should net cost be more or less than specified amount of allowance, adjust contract sum accordingly by Change Order.
   1. Amount of Change Order will recognize any changes in handling costs at site, labor, installation costs, overhead, profit, and other expenses caused by selection under allowance.
   2. For products specified under unit cost allowance, unit cost shall apply to quantity listed in Schedule of Values.
   3. For products specified under unit allowance, unit cost allowance shall apply to quantities actually used with nominal amount for waste, as determined by receipts, invoices, or by field measurement.
B. Submit any claims for anticipated additional costs at site, or other expenses caused by selection under allowance, prior to execution of work.
C. Submit documentation for actual additional costs at site or other expenses caused by selection under allowance within sixty days after completion of execution of Work.
D. Failure to submit claims within designated time will constitute waiver of claims for additional costs.
E. At contract closeout, reflect approved changes in contract amounts in final statement of accounting.

1.06 CONSTRUCTION CONTINGENCY:

A. Include in the Contract amount Construction Contingency Allowance in the amounts shown in Paragraph 3.01.
B. Construction Contingency Allowance:
   1. Use only to cover cost of hidden, concealed, or otherwise unforeseen conditions that develop during project.
   2. Work which is clearly changed in scope shall be authorized and paid for only by means of change order executed in accordance with established Owner procedures.

3. Include in Base Bid, profit and overhead to cover amount of contingency, as each contingency authorization processed will not include any profit or overhead for Contractor.
4. Proceed with accomplishing work only after receiving properly executed contingency authorization executed by FAA.
5. Do not bill FAA for any work authorized by this procedure until work has been accomplished.
6. Return to FAA any part of contingency allowance that is not used during construction of project.
7. At completion of project, Contracting Officer will reconcile all work accomplished through properly executed contingency allowance authorizations and provide for refund of any unused portion of contingency to Owner through properly executed change order.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

Not Used.

END OF SECTION 01 21 00

SECTION 01 22 00

UNIT PRICES

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Unit prices for calculation of work, complete in place, to be added or deleted from the project.

1.02 MEASUREMENT AND PAYMENT:

A. It is the intent of the Bid Form that aggregate bid amount as submitted shall cover work required by Contract Documents in place, complete, and ready for use.
B. Unit prices include costs to fully complete work in place, including providing labor, materials, tools, equipment, services, supplies, incidentals, necessary operations, profit, taxes, overhead, maintenance, and warranties.
C. No costs in connection with work required by Contract Documents for proper and successful completion of Contract will be paid outside of or in addition to prices submitted.
D. Work not specifically set forth as pay items shall be considered subsidiary obligations of Contractor and costs shall be included in prices named.
E. Method of measurement and basis of payment shall be as stipulated in following paragraphs.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

3.01 UNIT PRICE ITEMS:

Item	Unit
1. Asphalt Pavement Demolition and Replacement, Including Base Course Repair:	$_____ per square yard
2. Asphalt Pavement Crack Repair:	$_____ per linear foot
3. Concrete Sidewalk Demolition and Replacement:	$_____ per square yard
4. Sealant Control Joint Removal and Installation:	$_____ per linear foot
5. Route and Seal Cracked Contraction Joint	$_____ per linear foot
6. Signs, Installed	$_____ each

7. Sign Posts, Installed: $_____ each

8. Drain through inlet concrete Mortar Repairs $_____ per cubic foot

3.02 AUTHORIZATION, RECORD KEEPING, AND PAYMENT FOR UNIT PRICE ITEMS:

A. COR/RE will authorize Contractor when Unit Price Items are to be installed by Contractor. No payment will be made for any Unit Price Items installed by Contractor that is not authorized by COR/RE.

B. COR/RE will maintain a record of all installed Unit Price Items and this record shall be utilized to produce the Change Order to include the Unit Price Items in Contractor's contract.

END OF SECTION 01 22 00

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

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

1. Coordination.
2. Project meetings.
3. Requests for Information (RFIs).

1.2 DEFINITIONS

A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.3 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work.

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

B. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. All salvaged materials shall be placed in a designated area for review by the RE/COR prior to disposal.

1.4 PROJECT MEETINGS

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

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date, time and location of each meeting. Notify the FAA Contracting Officer (CO), RE/COR, Project Engineer, and subcontractors of dates, times and location of the weekly meeting.

B. Pre-construction Conference: A pre-construction conference will be held before starting construction. Location and time designated by FAA. The meeting will review responsibilities and personnel assignments.

1. Attendees: Contracting Officer, Project Engineer, RE/COR, FAA SECM and other authorized representatives of the FAA, Contractor and his superintendent. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Sign in Sheet
b. Tentative overall construction schedule.
c. Designation of key personnel and their duties.
d. Procedures for processing field decisions and Change Orders.
e. Procedures for RFIs.
f. Submittal procedures. (Submittal Log & Numbering)
g. Use of the premises and existing facility.
h. Work restrictions.
i. Owner's occupancy requirements.
j. Responsibility for temporary facilities and controls.
k. Parking availability and location.
l. Equipment deliveries and priorities.
m. Security.
n. Progress cleaning.
o. Working hours.
p. Notice to Proceed Letter (NTP) by Contracting Officer.
q. Final clean up and punch list.
r. Letter designating RE/COR by Contracting Officer
s. Schedule of Values.
t. Review Form 3900-18, FAA Pre-Construction and Maintenance Project Safety and Health Checklist. Form 3900-18 at end of Section 013100.

C. Progress Meetings:

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

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

1) Status of submittals.
2) Deliveries.
3) Access.
4) Site utilization.
5) Work hours.
6) Hazards and risks including any proposed utility outages or cutovers

7) Progress cleaning.
8) Quality and work standards.
9) Status of correction of deficient items.
10) Field observations.
11) RFIs.
12) Status of proposal requests.
13) Pending changes.
14) Status of Change Orders. (Maintain change order log with status)
15) Pending claims and disputes.

1.5 REQUESTS FOR INFORMATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, prepare and submit all RFI's in the form specified.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Hard-Copy RFIs: Form at end of this Section.

1. Identify each page of attachments with the RFI number and sequential page number.

C. FAA's Action: The CO will review each RFI, determine action required, and return it. Allow five (7) working days for the CO's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:

a. Requests for approval of submittals.
b. Requests for approval of substitutions.
c. Requests for coordination information already indicated in the Contract Documents.
d. Requests for adjustments in the Contract Time or the Contract Sum.
e. Requests for interpretation of the engineering's actions on submittals.
f. Incomplete RFIs or RFIs with numerous errors.

2. CO's action may include a request for additional information.

D. On receipt of the CO's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify the CO within three (3) working days if Contractor disagrees with response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at each weekly updated meeting.

F. PRODUCTS (Not Used)

PART 2 - EXECUTION (Not Used)

END OF SECTION 013100

REQUEST FOR INFORMATION

PROJECT NAME:		RFI NO.
LOCATION:		⎦ STRUCTURAL
CONTRACT NO:		⎦ ARCHITECTURAL
TO:	REVIEWER:	⎦ MECHANICAL
FROM:	DATE SENT:	⎦ ELECTRICAL
SPECIFICATION/DRAWING REF.:		⎦ PLUMBING

REQUEST:	
SIGNATURE:	DATE:

RESPONSE:	
SIGNATURE:	DATE:

COPY: Project Manager:	Field Rep:	Designer:
Architect/Engineer:	Date Control Tech:	Contract File:

SECTION 01 33 00

SUBMITTALS

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Submittals required by Specification Sections and as listed in attached List of Submittals.

1.02 REQUIRED SUBMITTALS:

A. Copy of the Contractor's executed insurance certificate.
B. Material manufacturer's written approval/acceptance of specified warranty for project, details, and all related materials based upon existing site conditions.
C. Copy of the Contractor's executed payment and performance bonds, if required.
D. Shop drawings of details, if proposed different from project drawings.
E. Manufacturer’s product data sheets and Material Safety Data Sheets (SDS) on each material proposed for usage.
F. Sample of warranty that is to be issued upon project completion.
G. Submit list of all subcontractors with evidence of subcontractor's insurance coverage in compliance with contract requirements.
H. Detailed project schedule showing work phasing and proposed daily progress schedule.
I. Permits, notices, and approvals of governing bodies or agencies.

1.03 SHOP DRAWINGS:

A. Original drawings, prepared by Contractor, subcontractor, supplier, or distributor, which illustrate some portion of the Work, showing fabrication, layout, setting, or erection details, prepared by a qualified detailer.
B. Prepare shop drawings for those details that are proposed different than the project drawings. Indicate on a site plan, the proposed location of detail presented on shop drawing.
C. Indicate joints, types, and locations of fasteners, shapes, sizes, expansion joints, special conditions, and installation procedures for each condition.
D. Submit shop drawings showing layout, joining, profiles, and anchorages of installed work.

1.04 PRODUCT DATA:

A. Submit manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data for each material proposed for use in construction of asphalt pavement repair materials, asphalt crack sealants, seal coat, pavement striping and markings, concrete materials, cementitious repair mortars, joint sealants, and related materials.
   1. Clearly mark each copy to identify pertinent materials, products, or models.
   2. Show dimensions and clearances required.
   3. Show performance characteristics and capacities.

4. Indicate the Specification Section and sub-paragraph that applies to each submittal.

1.05 SAMPLES:

A. Physical examples to illustrate materials, equipment, and workmanship; and to establish standards by which completed Work is judged, if requested.

1.06 CONTRACTOR RESPONSIBILITIES:

A. Review shop drawings, product data, and samples prior to submission. Initial, sign, or stamp, certifying the Contractor's review of the submittal.
B. Verify:
   1. Field measurements.
   2. Field construction criteria.
   3. Catalog numbers and similar data.
C. Coordinate each submittal with requirements of Work and of Contract Documents.
D. Contractor's responsibility for errors and omissions in submittals is not relieved by CO review of submittals.
E. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by the CO review of submittals, unless CO gives written acceptance of specific deviations.
F. Notify CO,COR/RE in writing at time of submission, of deviations in submittals from requirements of Contract Documents.
G. Begin no work which requires submittals until return of submittals with COR stamp and initials or signature indicating review and indication to proceed as noted. Work performed prior to submission and approval of submittals may be subject for rejection.
H. Distribute copies after COR approval.

1.07 SUBMISSION REQUIREMENTS:

A. Schedule submissions to the COR immediately after Contract award.
B. Submit electronic copies of submittals.
C. Submit three of each sample requested.
D. Accompany submittals with transmittal letter containing:
   1. Date.
   2. Project title and number.
   3. Contractor's name and address.
   4. The number of each submittal.
   5. Notification of deviations from Contract Documents.
E. Provide each set of submittals with a Cover and Table of Contents.

1.08 RE-SUBMISSION REQUIREMENTS:

A. Product Data and Samples: Submit new data and samples as required for initial submittal.
B. Shop Drawings:
   1. Revise initial drawings as required and re-submit as specified for initial submittal.
   2. Indicate on drawings any changes which have been made other than those requested by Owner.

1.09 DISTRIBUTION OF SUBMITTALS AFTER REVIEW:

A. CO will forward one copy of approved or corrected submittals to Owner.
B. CO will forward one copy of approved or corrected submittals to Contractor.
C. Contractor shall distribute remaining copies of submittals which carry Project Engineer's stamp as required for construction, including Contractor's file, jobsite file, subcontractors, suppliers, and fabricators.

1.10 LIST OF SUBMITTALS:

SECTION 01 33 00 - SUBMITTALS

- Submittals - Electronic copy.

SECTION 01 60 00 - MATERIAL AND EQUIPMENT

- Substitution Request Form – Electronic copy.

SECTION 01 70 00 - CONTRACT CLOSEOUT

- Warranties and Bonds.
- Evidence of Payment and Release of Liens.

SECTION 02 40 00 - MINOR DEMOLITION AND RENOVATION WORK

- Product Data and SDS.

SECTION 03 20 00 – CONCRETE REINFORCEMENT

- Product Data and SDS.
- Shop Drawings, where applicable.
- Manufacturers Certificates.

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

- Materials Certificates.
- Product Data and SDS.
- Shop Drawings, where applicable.
- Mix Designs.
- Curing Methods.

SECTION 03 61 00 – CONCRETE REHABILITATION

- Product Data and SDS.
- Shop Drawings, where applicable.
- Sample.

SECTION 07 92 00 – SEALANTS AND CAULKING

- Product Data and SDS.
- Shop Drawings, where applicable.
- Samples, if requested.

SECTION 32 01 17 – ASPHALT PAVEMENT REPAIRS

- Product Data and SDS.
- Shop Drawings, where applicable.

SECTION 32 01 17.61 – CRACK SEALING ASPHALT PAVEMENT

- Product Data and SDS.

SECTION 32 11 17 – REWORKING FLEXIBLE BASE MATERIAL

- Product Data and SDS.

SECTION 32 12 36 – SEAL COATS ON ASPHALT PAVEMENT

- Product Data and SDS.
- Shop Drawings, where applicable.
- Aggregate Gradation.
- Certifications.

SECTION 32 17 23 – PAVEMENT MARKINGS

- Product Data and SDS.
- Project List.
- Sample Warranty.
- Equipment List.
- Progress Schedule.
- Samples.
- Field Samples.

SECTION 32 17 23.23 – REFLECTORIZED PAVEMENT MARKERS

- Product Data and SDS.
- Manufacturer's Test Results.

SECTION 34 14 41 - SIGNAGE

- Product Data and SDS.
- Shop Drawings, where applicable.
- Samples, if requested.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

Not Used.

END OF SECTION 01 33 00

SECTION 01 35 13

FIRE PREVENTION PRECAUTIONS FOR HOT WORK

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Observe the following safeguards when performing hot work (i.e., operations where open flames, torch cutting, or implements utilizing heat are used).

1.02 RELATED SECTIONS:

A. 02 40 00 – Minor Demolition and Renovation Work.
B. 32 01 17 – Asphalt Pavement Repairs
C. 32 01 17.61 – Crack Sealing Asphalt Pavements
D. 32 12 36 – Seal Coat on Asphalt Pavement

1.03 SAFETY PRECAUTIONS:

A. Must follow Standard Operating Procedures Welding and Compressed Gases. (Attachments no. 4)
B. Ensure that operations involving the use of open-flame equipment are not conducted until a Permit for Welding, Cutting, and Burning has been completed and signed by Owner's Representative.
C. Prior to operations, visit job site and establish suitable locations for the portable equipment during actual operations and storage. Responsible supervisor for Contractor and COR/RE shall confer and decide upon such locations with Owner's decision being final in event of disagreement.

1.04 NOTIFICATION:

A. Notify COR/RE of the area of operations for each day and of all subsequent changes that occur. This is necessary to assure inspection of all areas by COR/RE/Owner.
B. Notify COR/RE/Owner of all locations where hot work has been performed not less than thirty minutes nor more than one hour after work is completed or stopped for the day.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

3.01 INSPECTION:

A. Before operations commence, furnish personnel to serve as a fire watch (or watches) for location(s) where hot work is to be performed. (One fire watchman may observe several locations in a relatively small contiguous area if approved by COR/RE). Each fire watchman shall have a Contractor furnished, suitable type, fully charged, operable fire extinguisher. Contractor is responsible that the fire watchman knows how to operate the fire extinguisher and how to turn on a fire alarm and/or summon the fire department.

WORK AREA	TYPE EXTINGUISHER	NO. REQ.
Equipment Spaces	CO_2 (15 pound)	2
Other spaces	Water (22 gallons) (E-10)	1
	CO_2 (15 pound)	1

1. Keep work area free of combustible material. Do not use welding equipment around flammable liquids or vapors.
2. Use fire resistant tarpaulins around work areas.
3. Keep welding and cutting equipment outdoors.
4. Keep equipment such as cables, hoses, and regulators in good condition.
5. Post a fire watch consisting of at least one man furnished by Contractor with a fire extinguisher in hand and with no other assigned duties to stand by and observe for potential hazards while welding or cutting is being done.
6. Equip fire watch with suitable personal eye protection and fire extinguishers.
7. At completion of work operations, immediately inspect work and adjacent area for hazards. Reinspect work for hazards at one-half hour and at one hour after completion of welding and cutting operations.
8. Notify COR/RE daily upon completion of welding or cutting operations.

B. Check vicinity before starting operations and take suitable precautions to minimize the hazard of a fire starting or communicating to other areas.

3.02 COMBUSTIBLE MATERIAL:

A. Transport and use all flammable and combustible materials in UL listed containers.
B. Do not perform hot work in areas where flammable liquids or explosive vapors are present or thought to be present. In the latter case, perform a combustible gas indicator (Explosimeter) test to assure that the area is safe. Contractor is responsible for arranging such test and he shall bear such charges as may be incurred.
C. Insofar as possible, remove and keep the area free from all combustibles (i.e., rubbish, paper, waste, etc.) within a twenty-five foot radius of operations.
D. If combustible material cannot be removed, furnish fireproof blankets and cover such materials with them, ensuring that no openings exist into which sparks can penetrate.
E. Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks, hot slag, etc., into surrounding combustible material.

3.03 SAFETY MEASURES:

A. Keep containers of gasoline, fuel, solvents, and other volatile and flammable materials a minimum of 30 feet (10m) from building.
B. Prevent the extension of sparks and particles of hot metal through windows and doors.

C. Where cylinders of gas are used in hot work, place a safe distance from work. Check hose and equipment for deterioration, malfunction, and leaks prior to starting operations. Provide suitable supports to prevent accidental overturning of cylinders. Shut off all cylinder control valves while the equipment is unattended. Keep acetylene cylinders in an upright position while in use and set the gas pressure regulator at 15 psi or less.
D. When hot work operations are completed or ended for the day, inspect each location of the day's work not sooner than thirty minutes and not later than one hour after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained.
E. If any of the above safeguards are not employed or are violated, the COR/RE/ Owner may, by written notice, stop the work until compliance is obtained. Such stoppage does not relieve Contractor from performing his work within the contract period for the contract price.

END OF SECTION 01 35 13

SECTION 01 35 16

ALTERATIONS PROJECT PROCEDURES

PART ONE - GENERAL

1.01 DESCRIPTION:

A. Summary: The procedures and administrative requirements of this Section apply to all of the following Sections of the Specification which are involved in alterations to the existing facility.

B. Extent Notes: Cut into or partially remove portions of the existing pavements and sidewalks as necessary to make way for new construction. Include such work as:
   1. Cutting, moving, or removal of items shown to be cut, moved, or removed.
   2. Cutting, moving, or removal of items not shown to be cut, moved, or removed, but which must be cut, moved, or removed to allow new work to proceed. Work or items which are to remain in the finished work shall be patched or reinstalled after their cutting, moving, or removal, and their joints and finishes made to match adjacent or similar work.
   3. Removal of existing surface finishes as needed to install new work and finishes.
   4. Removal of abandoned items and removal of items serving no useful purpose, such as abandoned piping.
   5. Repair or removal of dangerous or unsanitary conditions resulting from alterations work.

1.02 SCHEDULING AND ACCESS:

A. Work Sequence: Contractor shall submit detailed project plan with work sequence and phasing schedule.

B. Security:
   1. Be solely responsible for job site security.
   2. Protect completed work and stored items from vandalism and theft.
   3. Contact COR/RE for access to all security areas.

C. Maintenance of Access and Operations:
   1. During period of construction, Owner will continue to perform normal activities in existing building. Maintain proper and safe access to Owner-occupied areas at all times.
   2. Schedule demolition and remodeling operations with COR/REO in such a manner as to allow Owner operations to continue with minimum interruption.
   3. During period of construction, do not obstruct existing exit ways of Owner-occupied areas in any manner.

D. Maintenance of Existing Services:
   1. Maintain environmental control in existing building, especially temperature, humidity, and dust control.
   2. Provide temporary lines and connections as required to maintain existing mechanical and electrical services in building.
   3. Equipment handling shall be limited to FAA-approved hours and may be limited to night time hours.

4. Notify Owner a minimum of seven days prior to each required interruption of mechanical or electrical service in building. Such interruptions shall be only at such times and for lengths of time as approved by COR/RE. In no event shall inter-ruption occur without prior approval of COR/RE.

E. Temporary Barricades:
1. Provide and erect barricades as necessary to protect ground personnel, employees, passersby, etc., from hazards resulting from the Work during construction operation.
2. Prevent public access to construction activities, equipment, and storage areas.

F. Building Access:
1. Contractor will limit access to the building interior except:
   a. For project or medical emergency.

1.03 ALTERATIONS, CUTTING AND PROTECTION:

A. Extent:
1. Perform cutting and removal so as not to cut or remove more than is necessary and so as not to damage adjacent work.
2. Conduct work in such a manner as to minimize noise and to minimize accumulation and spread of dirt and dust.
3. Perform cutting with carborundum saw with approved dust arrestor.

B. Responsibility and Assignment of Trades:
1. Contractor shall assign the work of moving, removal, cutting, patching, and repair to trades under his supervision so as to cause the least damage to each type of work encountered, and so as to return the facility as much as possible to the appearance of new work.
2. Patching of finish materials shall be assigned to mechanics skilled in the work of the finish trade involved.

C. Protection:
1. Protect remaining finishes, equipment, and adjacent work from damage caused by cutting, moving, removal, and patching operations. Protect surfaces which will remain a part of the finished work.
2. Cover adjacent surfaces where necessary to prevent damage from construction operations.
3. During demolition, cutting, and construction, provide positive dust control by wetting dusty debris and by completely sealing openings in the existing building with temporary seals so as to prevent spread of dust and dirt to interior areas.
4. After materials are installed, properly protect Work until final acceptance.
5. Repair any damage resulting from construction operations without cost to Owner.
6. Provide continuous security during non-working hours. Prevent unauthorized entry into the existing facility.

D. Special Protection:
1. Comply with Standard Operating Procedures Welding and Compressed Gases(Attachments no. 4) and welding and cutting precautions specified in Section 01 50 00 -Temporary Facilities and Controls. In addition, provide Type I fire retardant enclosure around area of welding.

E. Debris:
   1. Remove debris from the site daily. Removed material becomes property of the Contractor. Load removed material directly on trucks for removal from site. Dispose of removed material legally.
   2. Do not allow material accumulations to endanger facility.
   3. Cover and secure material accumulations as necessary to prevent the material from spreading over the site or becoming airborne.
   4. Submit material storage and disposal plan for review prior to job start.

1.04 PATCHING, EXTENDING, AND MATCHING:

A. Patch and extend existing work using skilled mechanics who are capable of matching the existing quality of workmanship. The quality of patched or extended work shall not be less than that which exists.
B. In areas where any portion of an existing finished surface is damaged, lifted, stained, or otherwise made or found to be imperfect, patch or replace the imperfect portion of the surface with matching material.
C. Provide adequate support or substrate for patching of finishes.
D. Quality:
   1. In the Sections of the product and execution of Specifications which follow these General Requirements, no concerted attempt has been made to describe each of the various existing products that must be used to patch, match, extend, or replace existing work. Obtain all such products in time to complete the Work on schedule. Such products shall be provided in quality which is in no way inferior to the existing products.
   2. The quality of the products that exist in the facility, as apparent during pre-bid site visits, shall serve as the Specification requirement for strength, appearance, and other characteristics.
E. Transitions:
   1. Where new work abuts or finishes flush with existing work, make the transition as smooth and workmanlike as possible. Patched work shall match existing adjacent work in texture and appearance so as to make the patch or transition invisible to the eye at a distance of no closer than 3 feet (1m).
   2. Where asphalt, concrete, or other finished surface is cut in such a way that a smooth transition with new work is not possible, terminate the existing surface in a neat fashion along a straight line at a natural line of division.
F. Restore existing work that is damaged during construction to a condition equal to its condition at the time of the start of the Work, and to satisfaction of Owner.

1.05 REPAIR:

A. Replace work damaged in the course of alterations, except at areas approved by Owner for repair.
B. Where full removal of extensive amounts of almost-suitable work would be needed to replace damaged portions, then filling, straightening, and similar repair techniques, followed by finishing, will be permitted.

C. If the repaired work is not brought up to the standard for new work, Owner will direct that it be cut out and replaced with new work.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

Not Used.

END OF SECTION 01 35 16

SECTION 01 40 00

QUALITY CONTROL

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. General Quality Control.
B. Manufacturers' Field Services.

1.02 QUALITY CONTROL, GENERAL:

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality.
B. Contractor shall have completed previous projects utilizing same materials and provide same warranty as specified herein.
C. Examine each phase of Work and have defective conditions corrected before starting subsequent operations which would cover, or are dependent upon, work in question.
D. Where visual examination is not sufficient, use instruments with qualified operators to examine work.
E. Utilize testing laboratory when services are necessary to assist Contractor in evaluating quality.
F. Perform material removal and new material installation using full-time employees of the Contractor.

1.03 WORKMANSHIP:

A. Comply with industry standards, except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
B. Utilize qualified personnel who have experience with the specified materials to produce workmanship of specified quality.
C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.
D. Provide finishes to match accepted samples.

1.04 MANUFACTURER'S FIELD SERVICES:

A. When specified in respective Specification Section, require manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, and to make appropriate recommendations.
B. Notify manufacturer's representative a minimum of two weeks prior to date of final inspection. Manufacturer's representative shall conduct an inspection of the completed installation before the final inspection, or shall attend the final inspection.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

Not Used.

END OF SECTION 01 40 00

SECTION 01 41 00

TESTING LABORATORY SERVICES

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Quality control testing services.
B. Samples of all materials to be tested in accordance with applicable standard specifications.
C. Furnish nominal labor and sheltered working space as necessary to obtain samples at the project.
D. Advise laboratory of the identity of material sources and instruct the suppliers to allow tests or inspections by the laboratory.
E. Notify the laboratory sufficiently in advance of operations to allow for completion of initial test and assignment of inspection personnel.

1.02 REFERENCES:

A. American Society for Testing and Materials (ASTM):
   1. C 31: Test Methods for Making and Curing Concrete Test Specimens in the Field.

1.03 DESCRIPTION OF REQUIREMENTS:

A. Required testing services are intended to assist in the determination of probable compliance of the work with requirements specified or indicated. These required services do not relieve Contractor of the responsibility for compliance with these requirements or for compliance with requirements of the Contract Documents.
B. Employ, at Contractor's expense, an independent testing laboratory to perform testing and inspection services for quality control testing during construction operations.
C. Cooperate with independent agencies performing required inspections, tests, and similar services.
D. Provide such auxiliary services as are reasonably requested. These auxiliary services include, but are not limited to, the following:
   1. Providing access to the work.
   2. Taking samples or assistance with taking samples.
   3. Delivery of samples to test laboratories.
   4. Security and protection of samples and test equipment at the project site.
A. Notify the testing agency sufficiently in advance of operations to permit assignment of personnel.
B. Coordinate work of independent testing agencies so as to avoid the necessity of removing and replacing the work to accommodate inspections and tests. Schedule times for inspections, tests, taking of samples, and similar activities.
C. Tests and related actions specified in this Section and elsewhere in the contract documents are not intended to limit Contractor's own quality control procedures which facilitate overall compliance with requirements of the Contract Documents.

1.04 QUALITY CONTROL, GENERAL:

A. Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which are recognized in the industry as specialized in the types of inspections and tests to be performed.

B. Contractor's testing agency shall be acceptable to the COR/RE/Owner and Project Engineer.

1.05 SUBMITTALS:

A. Contractor's testing agency or agencies qualifications.

B. Production sample test reports.

C. Concrete mix designs proposed for use.

D. Certified written report of each inspection, test, or similar service, directly to the CO, in duplicate.

E. Report Data: Written reports of each inspection, test, or similar service shall include, but not be limited to, the following:

1. Name of testing agency or test laboratory.
2. Dates and locations of samples and tests or inspections.
3. Names of individuals making the inspection or test.
4. Designation of the work and test method.
5. Complete inspection or test data.
6. Test results.
7. Interpretations of test results.
8. Notation of significant ambient conditions at the time of sample taking and testing.
9. Comments or professional opinion as to whether inspected or tested work complies with requirements of the Contract Documents.
10. Recommendations on retesting, if applicable.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

3.01 DUTIES AND AUTHORITIES OF DESIGNATED TESTING AGENCY:

A. Agency and its representatives are not authorized to alter any requirement of the Contract Documents, nor to approve or accept any portion of the work.

3.02 TEST METHODS:

A. Conduct tests and inspections in accordance with the requirements of the specifications or, if not herein specified, in accordance with the latest standards of ASTM, ACI, or other recognized authorities.

3.03 CONCRETE:

A. Mix Design: In advance of concrete operations, sample and test materials proposed

for use in concrete to determine their compliance with these specifications. Mix proportions shall be established by the laboratory for each strength and type of concrete required and reports submitted to the COR/RE for approval showing the recommended mix designs.

B. Evaluate test results for standard molded and cured test cylinders separately for each concrete mix design. For evaluation of potential strength and uniformity, each mix design shall be represented by at least five tests.

C. Consider strength level of concrete satisfactory so long as averages of all sets of three consecutive strength test results equal or exceed specified strength and no individual strength test result falls below specified strength by more than 500 psi.

D. For each day's pour of one hundred cubic yards or fraction thereof, three test cylinders shall be cast for each different strength of concrete placed. One cylinder shall be tested and reported at seven days and two at twenty-eight days unless otherwise directed.

3.04 SOIL COMPACTION:

A. Test and inspect subgrades and fill layers to be compacted to determine compliance with the Specifications.

B. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D 2922 (nuclear method).

C. Take at least four field density tests at locations and elevations as directed. If in the opinion of RE/COR, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional cost to FAA.

3.05 ACCEPTANCE OF IN-PLACE WORK:

A. Completed work which meets all applicable requirements will be accepted without qualification.

B. Completed work which fails to meet one or more requirements but which has been repaired in a manner acceptable to the COR/RE Representative to bring it into compliance will be accepted without qualification.

3.06 REMEDIES FOR REJECTED WORK:

A. Structural analysis and/or additional testing will be required when strength of structure is considered potentially deficient.

B. Repair or replace work rejected due to appearance or tolerance deficiencies, as directed, at no additional expense to FAA.

3.07 RETEST RESPONSIBILITY:

A. Where results of required inspections, tests, or similar services prove unsatisfactory and do not indicate compliance of related work with the requirements of the Contract Documents, then retests are the responsibility of Contractor, regardless of whether the original test was the Contractor's responsibility.

B. Retest of the work revised or replaced by Contractor is the Contractor's responsibility, where required tests were performed on original work.

3.08 REPAIR AND PROTECTION:

A. Upon completion of inspection, testing, sample-taking, and similar services performed on the work, repair damaged work and restore substrates and finishes to eliminate deficiencies, including deficiencies in the visual qualities of exposed finishes.

B. Protect work exposed by or for quality control service activities, and protect repaired work.

C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility of inspection, testing, or similar services.

END OF SECTION 01 41 00

SECTION 01 42 16

DEFINITIONS

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Definitions for construction terminology not otherwise defined in Contract Documents.
B. Definitions for special terminology used for this Project.

1.02 ABANDONED - (NO LONGER NECESSARY OR IN USE):

A. "Remove" items so noted, or later defined, as an all inclusive responsibility within this contract. Pay for all work in connection with removal of these items, including municipal, disposal, utility, and service charges. Dispose of all "Excess".

1.03 ADDITION - (TO ADD TO AND BE INCORPORATED) ALSO TO "ADD":

A. Work supplementary to that indicated to accomplish that which is required by the Contract Documents. To bring to a new condition; to extend, fasten, patch, and match to that which is existing.

1.04 DEFECTIVE - (NOT ACCEPTABLE):

A. Refer to Conditions of the Contract, that which does not conform to the Contract Documents. As it applies to "Salvage", in addition to the above, shall mean "unsuitable".

1.05 EXCESS - (NOT REQUIRED):

A. More quantity than required to conform to the Contract Documents and not desired by the COR/RE/Owner. Debris shall be considered "Excess" and not be used as fill or be buried on this site. Remove "Excess" from the site and legally dispose of. "Excess" "Suitable" "Salvage" shall be property of Contractor unless otherwise specified.

1.06 EXISTING - (PRESENTLY THERE):

A. Also may be noted "original". Present conditions and assumed locations, if known, as of the Date of Contract Documents.

1.07 NEW - (TO BE INCORPORATED) NOT EXISTING:

A. Refer to various specification sections for requirements of Work to be incorporated.

1.08 REINSTALL - (TO INCORPORATE AS WAS ONCE DONE):

A. "Remove" and "salvage" existing from its location, if it does exist. "Restore", "Renovate", or "Remodel" and "Reinstall: in its existing location. Reincorporate and "re-work" the original work to the extent required by the Contract Documents.
B. If the "Existing" item, so indicated, is missing, defective, or unsuitable as "Existing", then "Reconstruct" only that portion with "New" products and incorporate as was original. Syn. Replace.

1.09 RELOCATE - ("REINSTALL" IN A NEW LOCATION):

A. "Reinstall" in a new location as indicated on Drawings.

1.10 REMAIN - (TO LEAVE WHERE IT IS EXISTING):

A. The final location of an item in its "existing" position, however, this shall not mandate the fact that this item will not move during this contract, specifically in order to "Preserve" or "Rework".

1.11 REMOVE - (TO TAKE FROM EXISTING LOCATION):

A. Work required to extract a portion or whole by one or a combination of methods and moved to a new location.
   1. "Abandoned": Remove items by dismantling, excavation, extraction, or demolition, if acceptable.
   2. Salvage: Remove by disassembly. "Relocate".
   3. Products: Where a specific portion of component of an assembly or whole is to be removed, take all precautions to prevent damage, defacement, and displacement to the "existing" to remain (i.e., mortar, bricks, and finishes).

1.12 RENOVATE - (TO REPAIR AND MAKE NEW):

A. The process required to bring an item to a present new standard of condition required by the Contract Documents (e.g., to "rework" "existing" "suitable" "salvage" "products" and perform "new" work and "additions" required). (Syn. rehabilitate, recondition, repair.)

1.13 REPLACE - (TO TAKE THE PLACE OF):

A. "Remove" "existing" unserviceable product and provide "new" product in place of unserviceable product.

1.14 REUSE - (TO USE AS ONCE WAS):

A. The use of "suitable" "salvage" for incorporation or re-incorporation in the Work. "Remove", "Relocate", and "Reinstall" as required for "Reuse".

1.15 SALVAGE - (TO BECOME ABANDONED):

A. "Remove", protect, "preserve" incomplete material condition as found "existing". Also to "Save". Determine suitability for incorporation in this Contract. Store at a location mutually agreed upon. Dispose of all "Excess".

1.16 UNKNOWN - (NOT SHOWN ON DRAWINGS):

A. Products beneath surfaces indicated by drawings and encountered during the Work. Immediately support, shore, and protect. Immediately notify the RE/COR and authority having jurisdiction. Allow free access for inspection. "Preserve" in proper condition until the COR/RE determines definition and interpretation of Work. Take such measures as required for protection, reinforcement, or adjustment.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

Not Used.

END OF SECTION 01 42 16

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART ONE - GENERAL

1.01 SANITARY FACILITIES:

A. Provide adequate temporary chemical toilets at time Work is commenced.
B. Maintain facilities in compliance with applicable health laws and regulations. Keep clean and unobtrusive.
C. Upon completion of Work, remove these facilities and all traces thereof.

1.02 STORAGE OF MATERIALS:

A. Provide suitable non-combustible, watertight coverings for storage of materials subject to damage by weather. Covering shall be of sufficient size to hold materials required on site at one time. Pallets shall be raised at least 6-inches (150mm) above ground, on heavy joists or sleepers.
B. If temporary storage sheds are used, locate storage areas where directed, maintain in good condition, and remove storage sheds when so directed. Locate storage areas of combustible construction a minimum of 30 feet (10m) from existing building.
C. Store materials on site unless otherwise approved by COR/RE.
D. Cover and protect materials subject to damage by weather, including during transit.
E. Do not use building as storage facility.
F. Provide additional storage at no cost to FAA in the event that additional storage area is required beyond that provided at project site.
G. Stored materials shall be available for inspection by COR/RE at all times.
H. Store flammable and volatile liquids in sealed containers located a minimum of 20 feet from existing buildings.
I. Transport flammable or volatile liquids in, and use from, U.L. listed safety cans.
J. Deliver material and equipment in manufacturer's original packaging with all tags and labels intact and legible. Handle and store material and equipment in such a manner as to avoid damage. Liquid products shall be delivered sealed, in original containers. Store roll goods in an upright position.
K. Proper storage of materials is the sole responsibility of Contractor. Protect all materials susceptible to moisture in dry, above ground, watertight storage. Keep all labels intact and legible, clearly showing the product, manufacturer, and other pertinent information.
L. Reject any materials becoming wet or damaged and remove from the jobsite immediately. Any materials observed to be improperly stored at the jobsite shall be considered wet at the discretion of COR/RE and removed from the jobsite.
M. Maintain products liable to degrade as a result of being frozen above 40 degrees Fahrenheit (4 degrees Celsius) in heated storage.
N. Random samples of all materials susceptible to moisture will be taken at various stages of the installation to ensure no significant variations in moisture.
O. Secure equipment, material, and debris to prevent movement by wind or other elements.

1.03 TEMPORARY WATER:

A. Contractor will arrange service and pay for all water service required for building purpose unless previously arranged with Owner.
B. Provide hoses for conveyance. Provide all necessary temporary piping and fixtures.

1.04 TEMPORARY ELECTRICAL ENERGY:

A. Make arrangements with COR/RE for temporary electrical service for completion of the Work. FAA will pay energy charges for temporary power and lighting.
B. Provide all necessary temporary wiring (In conduit if requested by COR/RE), extensions, and temporary lighting devices.

1.05 GUARDRAILS, BARRICADES, AND TEMPORARY COVERINGS:

A. Provide barricades as required to protect natural resources, site improvements, existing property, adjacent property, and passers-by.
B. Where pedestrian traffic is through or adjacent to work areas, provide necessary guardrails and barricades to protect pedestrians and to prevent pedestrian access to Work areas.
C. Remove guardrails and barricades at completion of construction.
D. Provide temporary 6-foot (2m) chainlink fence around setup areas.

1.06 PROTECTION:

A. Maintain bench marks, monuments, and other reference points. If disturbed or destroyed, replace as directed.
B. Protect existing adjacent streets, sidewalks, curbs, buildings, and property including trees, lawns, and plants.
C. Refer to Section 01 35 16 – Alterations Project Procedures, for protection requirements of existing facility.

1.07 TEMPORARY FIRE PROTECTION:

A. During construction, Contractor and his subcontractors and sub-subcontractors and their agents and employees shall comply with fire safety practices as outlined in NFPA Pamphlet 241 and local fire protection codes, and in addition shall:
   1. Provide following stored pressure extinguishers during entire construction period:
      a. One U.L. rating 4A-60B:C dry chemical fire extinguisher.
      b. One U.L. rating 2A 2-1/2 gallon water fire extinguisher.
      c. One U.L. rating 10B:C carbon dioxide fire extinguisher with horn and hose assembly.
   2. Provide fire extinguishers together in each of following areas:
      a. Each 3000 square feet of work area or fraction thereof.
      b. Each temporary structure including construction office and storage and tool and workshop sheds.
      c. Each piece of equipment using open flame when equipment is in use.
   3. Contractor's superintendent or other assistant superintendents shall be appointed as project fire warden for entire construction period.
   4. Train workmen in proper use of each type fire extinguisher.

5. Post telephone number of fire department, specific information regarding location of on-site fire fighting equipment, and procedures to be followed in event of fire.
6. Maintain free access at all times to fire extinguisher equipment, fire hydrants, and outside connections for standpipe hose systems.
7. Maintain all exit facilities and access thereto, free of material and other obstructions.

1.08 EMPLOYEE CONTROL:

A. Do not allow construction employees to enter owner occupied areas. Maintain construction traffic in designated access routes.

1.09 PARKING FACILITIES:

A. Parking area for a designated number of construction personnel vehicles will be made available with coordination with COR/RE.

1.10 CLEANING DURING CONSTRUCTION:

A. Oversee cleaning and ensure that site is maintained free from accumulations of waste materials and rubbish.
B. Sprinkle dusty debris with very fine water mist to control accumulation of dust. Do not use water in quantity so as to puddle.
C. At not less than every day during progress of work, clean up work areas and access areas and dispose of waste materials, rubbish, and debris.
D. At Contractor's option, on-site dump containers may be used for collection of waste materials, rubbish, and debris. Locate containers a minimum of 30 feet (10m) away from building entrances at a location acceptable to COR/RE. If used, remove containers when filled.
E. Do not allow waste materials, rubbish, and debris to accumulate and become an unsightly or dangerous condition.
F. Remove waste materials, rubbish, and debris from site and legally dispose of at public or private dumping areas off FAA property.
G. Keep streets and access to site free of rubbish and debris.

1.11 PERMITS:

A. Obtain and pay for all required local and state permits, licenses, and registrations. Work may be subject to ordinances, laws, codes, and regulations.
B. Prior to bidding, notify CO of any violation, omission, or questions of compliance. Required corrections to Specifications will be made via Addenda prior to receipt of Bids.
C. Be responsible for full compliance and bear cost of additional work not specified that may be required by authorities having jurisdiction.

1.12 REGULATORY REQUIREMENTS:

A. International Building Code (IBC), latest edition; as amended by the City of Abilene, or Authorities Having Jurisdiction.
B. Occupation Safety and Health Administration (OSHA) requirements, as applicable.
C. United States Environmental Protection Agency (EPA) requirements, as applicable.

D. Adhere to all limitations, cautions, and regulatory standards referenced by the manufacturer of each material provided.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

Not Used.

END OF SECTION 01 50 00

HOT WORK PERMIT

Hot Work Permits are required when any heat, spark or smoke producing operations are conducted in areas not specifically designed for these operations. Specific examples of Hot Work include, but are not limited to: Torch cutting, welding, soldering, grinding, brazing, and open tar operations. All hot work shall be performed in accordance with 3900-19.

Due to the high hazard associated with hot work in areas not designated for hot work it should be avoided whenever possible. Consider the following before issuing a hot work permit:

- Is it possible to move hot work to an area designed for hot work, equipped with all of the necessary controls?
- Can alternative processes to hot work be used in place of hot work? (e.g. glue, screws, bolts)

PROJECT INFORMATION

Starting Date: _____ Start Time: _____ (Please estimate) Building: _____ (Building Number/Name)

Expiration Date: _____ Completion Time: _____ (Please estimate) Location: _____ (Room #/Area)

Project Description: _____

CONTACT INFORMATION

Person Requesting Permit: _____ **(COTR, Construction Engineers, or Facility Maintenance Specialists)** Phone #: _____

Routing Symbol: _____

Person Performing Work: **(Lead person at the hot work site)** _____ Phone # _____

Company Name: **(Performing Work)** _____ Phone #: _____

Contracting Supervisor: _____ Phone #: _____

NOTIFICATIONS

	Person Contacted	Phone	Fax	Date (MM/DD/YYYY)	Time (am/pm)
Facility POC					
SSC					

Notes: **IN CASE OF EMERGENCY, CALL 911.**

HOT WORK SITE PREPARATION AND PRECAUTION

Each applicable box below must be checked prior to issuing the permit.

The person completing this checklist certifies that the following precaution has or will be adhered to:

- ☐ All equipment to be used has been inspected and is in good repair.
- ☐ Hot work will be performed by qualified personnel.
- ☐ Floor and wall openings are tightly sealed within 35 feet of the hot work site.
- ☐ Combustible materials are removed from the area within 35 feet of the hot work site.
- ☐ Flammable and combustible liquids are removed and secured away from the work site.
- ☐ If combustible materials are immovable they are protected with metal guards or flameproof covers.
- ☐ The floor is swept clean within 35 foot of the hot work site.
- ☐ Combustible floors are protected with protective sheeting within 35 feet of the hot work site.
- ☐ Where needed, fire tarpaulins are suspended beneath work.
- ☐ Ducts and conveyors within 35 foot of the hot work site, that may carry sparks are tightly sealed or shutdown.
- ☐ Hot Work performed in confined spaces will be performed using appropriate entry and work procedures as described in 3900.19. Contact your EOSH coordinator for additional assistance.
- ☐ Atmospheric testing is performed when Hot Work is being completed where the potential for flammable gases, vapors, or potentially explosive dust mixtures exist. Contact your EOSH coordinator for additional assistance.
- ☐ Personnel involved with Hot Work are familiar with local emergency notification and evacuation procedures.
- ☐ A copy of the hot work permit is posted in plain view near Hot Work site.
- ☐ The sprinkler system, where provided, is in service.

Fire Watch

- ☐ A person other than the operator is assigned to act as fire watch throughout the hot work and 30 minutes after the hot work operations have ended.
- ☐ The fire watch is performing no other duties during their assignment as the fire watch.
- ☐ The fire watch is familiar with local emergency notification and evacuation procedures.
- ☐ The fire watch is equipped with a fire extinguisher and properly trained in its use.
- ☐ The fire watch has access to alarms or two-way radios throughout the fire watch assignment.
- ☐ Multiple personnel are assigned as the fire watch when adjoining areas, rooms, or floors are at risk to heat and spark from the hot work.

Please, note any action(s) taken to accommodate the conditions above: (e.g. performed atmospheric testing, removed cardboard boxes, covered floor openings, Multiple hot work personnel were assigned):

Signature: _____ **Date:** _____

(Person completing the checklist)

Notes∴**:** **IN CASE OF EMERGENCY, CALL 911.**

Signature: _____ Date: _____

(Permit Issuer)

∴ Include information on fire prevention measures.

SECTION 01 60 00

MATERIAL AND EQUIPMENT

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Material and Equipment Incorporated Into Work:
   1. Conform to applicable specifications and standards.
   2. Comply with size, make, type, and quality specified, or as specifically approved in writing by CO.
   3. Manufactured and Fabricated Products:
      a. Design, fabricate and assemble in accordance with recognized industry standards.
      b. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
      c. Two or more items of same kind shall be identical, by same manufacturer.
      d. Products suitable for service conditions.
      e. Adhere to equipment capacities, sizes, and dimensions shown or specified unless variations are specifically approved in writing.

B. Do not use material or equipment for purposes other than that for which it is designed or is specified.

1.02 REUSE OF EXISTING MATERIAL:

A. Except as specifically indicated or specified, materials and equipment removed from existing structure shall not be used in completed Work.

B. For material and equipment specifically indicated or specified to be reused in 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. Pay costs for such work.

1.03 MANUFACTURER'S INSTRUCTIONS:

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in installation, including two copies to CO.
   1. Maintain one set of complete instructions at jobsite during installation and until completion.
   2. Submit two copies to CO with appropriate Product Data submittal.
   3. CO will forward one copy to SSC manager.

B. Handle, install, connect, clean, condition, and adjust products in strict accordance with such instructions and in conformity with specified requirements.
   1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with COR/RE for further instructions.
   2. Do not proceed with work without clear instructions.

C. Perform Work in accordance with manufacturer's instructions. Do not omit preparatory steps or installation procedures unless specifically modified or exempted by Contract Documents.

1.04 TRANSPORTATION AND HANDLING:

A. Arrange deliveries of products in accordance with construction schedules. Coordinate to avoid conflict with work and conditions at site.
   1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
   2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.

B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.05 SUBSTITUTIONS AND PRODUCT OPTIONS:

A. Contractor's Options:
   1. For products specified only by reference standard, select any product meeting that standard, by any manufacturer.
   2. For products specified by naming several products or manufacturers, select any product and manufacturer named.
   3. Products specified by naming only one product and manufacturer are to establish a quality standard. For products other than the named product, submit request for substitution as specified below.

B. Substitutions:
   1. During Bidding, CO will consider written requests from Bidders and manufacturers for substitutions of products in place of those specified. Such requests must be received IN ACCORDANCE WITH THE SIR RFIs due date. Requests received after that time will not be considered. Approval of proposed substitutions will be set forth in an Addendum or letter of approval. Requests for substitutions shall include data listed below.
   2. Submit two copies of request for each substitution, supported with complete data, drawings, and appropriate samples substantiating compliance of proposed substitution with Contract Documents, including:
      a. Product description, performance and test data, and applicable reference standards.
      b. Name and address of similar projects on which product was used and date of installation.
      c. Itemized comparison of qualities of proposed substitution with that specified.
      d. Changes required in other elements of Work because of substitution.
      e. Affect on construction schedule.
      f. Availability of maintenance service and source of replacement materials.

C. Contractor's Representation: Request for substitution constitutes a representation that Contractor:
   1. Has investigated proposed product and determined that it is equal to or superior in all respects to that specified.
   2. Will provide same warranties for substitution as for product specified.
   3. Will coordinate installation of accepted substitution into Work and make such other changes as may be required for Work to be complete in all respects.
   4. Waives all claims for additional costs, under his responsibility, related to substitution which subsequently becomes apparent.
D. Substitutions will be not be considered if:
   1. They are indicated or implied on Shop Drawings or Product Data submittals without formal request submitted in accordance with this Section.
   2. They are submitted after time limit specified above.
   3. Acceptance will require substantial revision of Contract Documents.
E. If substitution is not approved or accepted, Contractor shall furnish specified product.

PART TWO - PRODUCTS

Not Used.

PART THREE - EXECUTION

Not Used.

END OF SECTION 01 60 00

PRODUCT SUBSTITUTION REQUEST FORM

Note: This form to be used by General Contractor only. Requests by others will be returned with no response.

Project:
Location:_____

Government:_____

Date: _____

We hereby submit for your consideration the following substitution instead of the item specified or shown on the Drawings:

Section Number: Paragraph Specified item

_____

Proposed Substitution:

_____

_____

Attach complete product data, drawings and descriptions of products, with fabrication and installation details. Provide laboratory tests if applicable.

Provide sample, if applicable. Indicate if sample will be provided under separate cover.

Include complete information on changes to Drawings and/or Specifications that proposed substitution will require for its proper installation.

Fill in blanks below: *(Include attachments if space is insufficient. Failure to provide information will void submittal)*

A. Reason(s) for proposed substitution: *(check all that apply)*

__1. Request is equivalent to product/material/assembly specified. *(Note: Attach technical documentation)*

____ 2. Specified product or method cannot be provided within the Contract time. *(Note: This request will not be considered if the product or method cannot be provided as a result of the Contractor's failure to pursue the Work promptly, or to coordinate the various activities properly, of if the Contractor fails to place timely orders)*

____ 3. Specified product or method cannot receive necessary approval by authority having jurisdiction, and Contractor certifies that the requested substitution can be approved. *(Note: Attach approval documentation)*

_____ 4. A substantial advantage is offered the Government, in terms of cost, time, energy conservation or other considerations of merit, after deducting redesign and evaluation costs of other work by the Government or separate contractors and similar considerations.

___ 5. Specified product or method cannot be provided in a manner which is compatible with other materials of the Work, and the Contractor certifies that the substitution will overcome the incompatibility.

_____ 6. Specified product cannot be properly coordinated with other materials in the Work, and the Contractor certifies that the proposed substitution can be properly coordinated.

___ 7. Specified product or method cannot receive a warranty as required by Contract Documents, and Contractor certifies that the proposed substitution can receive required warranty.

B. B. Does the substitution affect dimensions or details shown on Drawings:

_____ No

_____ Yes *(Note: Attach marked up prints of drawings showing changes required)*

C. C. What effect does the substitution have on other trades?

_____

_____

D. D. Compare significant qualities of proposed substitution with those of work or product originally specified or shown on drawings. Include elements such as size, weight, durability, performance, visual effect, etc.

_____

_____

E. E. Coordinate information. Include all changes required in other elements of the work in order to accommodate the substitution, including work performed by Government or separate contractors.

_____

_____

F. F. State effect substitution will have on the work schedule in comparison to the schedule which would prevail without the proposed substitution. State the effect of the proposed substitution on Contract Time.

_____

_____

G. G. Provide complete cost information, including a proposal of any net change in the Contract Amount.

_____

_____

H. H. Manufacturer's warranties of the proposed substitution and specified items are:

_____ Same

_____ Different *(Note: Explain on attachment)*

The undersigned Contractor certifies its opinion that, after thorough evaluation, the proposed substitution will result in work that in every significant respect will be equivalent to or superior to the work required by the original Contract Documents and that it will perform adequately in the application indicated.
Rights to additional payment or time because of failure of the substitution to perform adequately are hereby waived.

The undersigned hereby agrees to pay in full for any changes to design, including detailing and engineering costs caused by the requested substitution.

Submitted by: *(Note: Submittal void and will be discarded if unsigned or if signed by entity other than Contractor)*

Signature: _____
(Contractor's authorized representative)

_____
(Title)

Firm Name: _____

Date: _____

For use by Contracting Officer Representative:

_____ Accepted **_____ Accepted as Noted**

_____ Not Accepted **_____ Received too late**

By: _____ Date: _____
(Contracting Officer Representative)

By: _____ Date: _____
(Contracting Officer Representative)

Remarks:

SECTION 01700 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

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

1. General use of products.
2. Progress cleaning.
3. Starting and adjusting.
4. Protection of new construction.
5. Correction of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

This facility operates 24 hours per day and actively controls air traffic 365days per year and must remain in operation. The Contractor must coordinate his/her activities with the COR and facility to maintain all services. No utilities shall be disconnected until written approval has been obtained from the COR. Any and all interruptions to services (water, sewer, electrical, etc.) must be approved in advance. Safe and secure access to the facility must be maintained at all times. If it becomes necessary to interrupt a utility service to the ATCT, or utilities not a part of this contract, prior approval shall be obtained in writing.

3.1 FACILITY OPERATION

It will be necessary for the Contractor to schedule and plan all work, and coordinate with the COR/RE so that normal FAA facility operations may continue with no disruption or interference.

THE CONTRACTOR SHALL SCHEDULE ALL WORK WITH THE COR/RE AND THE LOCAL FAA PERSONNEL IN ADVANCE AND SHALL TAKE ANY AND ALL PRECAUTIONS NECESSARY, OR AS DIRECTED BY THE COR, TO PROTECT ALL EQUIPMENT AT THE ATCT FROM ANY DAMAGE AS A RESULT OF CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL ALSO MAINTAIN THE OPERATIONAL INTEGRITY OF THE AIR TRAFFIC SYSTEM WITHOUT ANY SERVICE INTERRUPTIONS. IN ADDITION, NO ELECTRICAL SYSTEM SHALL BE ENERGIZED OR DE-ENERGIZED BY THE CONTRACTOR WITHOUT COORDINATION WITH THE COR. THE CONTRACTOR SHALL NOT UNDERTAKE ANY WORK THAT HAS NOT BEEN PREVIOUSLY COORDINATED, SCHEDULED, AND APPROVED BY THE FAA. INTERRUPTION OF THE AIR TRAFFIC CONTROL FUNCTION CAN RESULT IN THE LOSS OF LIFE AND PROPERTY.

3.2 Construction Limits and Access

The Contractor shall confine operations, activities, movement and storage of vehicles, equipment, materials, deliveries, and employee parking to such routes, times, and locations as may be designated by the COR or other authorities having jurisdiction, or as further described elsewhere in the specifications or drawings. The Contractor shall prevent any abuse, damage, spillage, etc., to such areas used, and shall maintain them and restore them to their original condition at the conclusion of the work. The Contractor shall prevent excess noise, air pollution, dust and water pollution from entering FAA operations areas.

3.3 EXAMINATION

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

1. Before construction, verify the location and points of connection of utility services.

B. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine entire parking lot for suitable conditions where products and systems are to be constructed.
3. Proceed with construction only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.4 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before construction.

B. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to the RE. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully. Execute cleaning during the progress or work, final inspection & completion of work.

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

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

1. Remove liquid spills promptly.

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

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

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

F. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted. Do not use the FAA dumpster.

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

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

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

J. Dust Control:

i. Provide the application of water during demolition of concrete materials on an as-need basis to reduce the creation of dust. Control water runoff.
ii. Work shall be stopped if dust cannot be controlled or limited due to wind conditions.
iii. Schedule operations so that dust and other contaminants resulting from the demolition and other work will not fall on wet or newly-coated surfaces.

K. Final Cleaning:

i. Remove grease, mastic, adhesive, dust, dirt, stains, fingerprints, labels, concrete and other foreign materials from visible interior and exterior surfaces.
ii. Prior to final completion, the Contractor shall conduct an inspection of all surfaces, and all work areas to verify that the entire work is clean.

3.6 Damage: Damage to existing paving, lawns, curbs, sidewalks, or buildings caused by the Contractor's activities shall be repaired. The Contractor shall pay all costs for repairs. After the Notice-To-Proceed and prior to the commencement of construction, the Contractor and COR shall conduct joint inspections of the existing areas that will be affected by the construction. Existing damage or defects shall be noted and will be used as the basis for determination of damages caused by the Contractor's operations. Failure of the Contractor to perform this inspection shall indicate that he accepts the area to be free of damage and defects.

3.7 Security: The site shall be secured to prevent the general public from entering any of the buildings on the ATCT facility plot. Security measures shall be in place prior to commencing construction activities.

3.8 Unities: The Contractor is required to protect all existing utilities. Damage to utilities will demand immediate repair or replacement at the Contractor's expense.

3.9 The Contractor shall provide temporary dust-proof barriers as required or as directed by the COR to protect all FAA equipment in or around the work area from damage during construction activities. The Contractor shall take all necessary precautions to protect FAA equipment from physical damage, accidental shutdown, and shall in no way hinder the operational capability of any equipment.

3.10 Contractor's Use of Premises: The Contractor shall have complete use of the premises within the construction limits for the execution of the work with the following exceptions.

I. Government use and access to premises: The government reserves the right to enter the work area at any time to perform routine or emergency repairs or testing. The Contractor shall allow the FAA full, uninterrupted access as required without interference. The FAA activities shall take precedence over the Contractor's activities.

II. Contractor shall assume full responsibility for the protection and safekeeping of products stored on the site.

3.11 Notification of Planned Overtime Work.- In the event the Contractor intends to work overtime, weekends, or holidays, he shall obtain the COR's approval at least 24 hours in advance of his commencement of the overtime work and 48 hours prior to weekend or holiday work.

3.12 Safety:

A. Contractor Responsibility. - The Contractor shall bear full responsibility to provide safe working conditions for their employees and subcontractors. The Contractor shall not permit any employee or subcontractor to work in surroundings or under working conditions that are unsanitary, hazardous or dangerous to the health and safety of the employee.

B. Safety Plan. - The Contractor shall furnish a Safety Plan for approval by the Government, not later than 30 days after award of the Contract. The Contractor shall bear responsibility for maintaining a safety program sufficient to meet job requirements, as confirmed through frequent and regular inspections of the job site, materials, and operation of equipment by a competent person so designated by the employer. The Safety Plan shall be available in the work area on the construction site at all times and shall specifically include, but not be limited to, the elements listed below. Also The Safety Plan shall identify key safety personnel and include phone numbers for those personnel in case of an emergency.

C. Accident Prevention. - The Contractor shall bear the responsibility of maintaining an accident prevention program in accordance with Title 29 CFR Part 1926.20 (b). The job site, materials, and equipment shall be inspected on a frequent and regular basis by a competent person designated by the employer to ensure compliance.

D. Use of Equipment. - The use of any machinery, tool, material, or equipment not in compliance with OSHA regulations shall be forbidden. The employer shall permit only those employees qualified by training or experience to operate equipment and machinery.

E. FAA Responsibility. - The FAA shall not be held responsible for safety inspections to assure Contractor conformance with the OSHA safety regulations. The FAA, however, reserves the right to notify the Contractor of any deficiencies regarding worker safety. Failure to correct such deficiencies may result in the FAA reporting such deficiencies to the local OSHA office.

3.13 Streets and roads. - All construction activities that may impact and/or slow down local traffic shall be coordinated with the COR. It may require the Contractor to perform such activities during off-peak traffic periods, such as at night.

3.14 Trucks covers. - All trucks carrying loose materials shall be covered at all times. This includes trucks carrying debris or any other truck determined by the Contracting Officer's Representative to be dropping debris on the public roads or drives.

3.15 Sanitation:

A. Use of existing facilities. - Existing sanitary facilities within the facility will not be available for use by the Contractor’s personnel. The Contractor shall provide temporary sanitary facilities for his employees. The temporary facilities shall be maintained regularly and removed at the end of the job.

3.16 Construction site. - The Contractor shall enforce such regulations in regard to cleanliness and the disposal of garbage and wastes to prevent the inception and spread of contagious and infectious disease and shall provide an ample supply of suitable, pure drinking water. The Contractor shall also take such means as the FAA may direct to effectively prevent the creation of a nuisance of any part of the construction site or adjacent property and streets.

3.17 Deliveries. - The Contractor shall notify the COR twenty-four (24) hours in advance of all deliveries to be received at the site. The Contractor shall be on site to receive all deliveries.

END OF SECTION 017000

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise the Resident Engineer (R.E.) of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Prepare and submit Project Record Documents, Final Completion construction photographs, and similar final record information.
5. Terminate and remove temporary facilities from project site, along with mockups, construction tools, and similar elements.
6. Complete final cleaning requirements, including touchup.
7. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion, also referred to as the Contractor Acceptance Inspection (CAI). On receipt of request, COR will either schedule the inspection within 14 days or notify Contractor of unfulfilled requirements. COR will prepare the Certificate of Substantial Completion after the inspection or will notify Contractor of items, either on Contractor's list or additional items identified by COR, that must be completed or corrected before certificate will be issued. COR will also provide a punch list that will form the basis of requirements for the Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Contractor should request final inspection prior to contract completion date. Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a Final Application for Payment.
2. Submit certified copy of COR's Substantial Completion inspection list (punch list) of items to be completed or corrected, endorsed and dated by COR. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Perform a final cleaning.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, COR will either proceed with inspection or notify Contractor of unfulfilled requirements. COR will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three (3) copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize items applying to each space by major element, including all categories.
2. Include the following information at the top of each page:

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

1.5 WARRANTIES

A. Submit original and duplicate copies of both Contractor's Warranty and Manufacturer's Guarantee to the RE/COR for designated portions of the Work.

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 Dust Control

A. Provide the application of water during demolition of concrete materials on an as-need basis to reduce the creation of dust. Control water runoff.

B. Work shall be stopped if dust cannot be controlled or limited due to wind conditions.

C. Schedule operations so that dust and other contaminants resulting from the demolition and other work will not fall on wet or newly-coated surfaces.

D. A detailed dust control plan shall be submitted by the Contractor with three (3) copies of the plan given to the Contracting Officer's Representative.

3.2 Debris Control

A. All areas under the Contractor's control shall be maintained free of extraneous debris. The Contractor shall initiate and maintain a specific program to prevent accumulation of debris at the construction site, storage and parking areas, or along access roads and haul routes. All of the Contractor's debris, including that created from demolition, shall be disposed of off the site.

B. Periodic collections and disposal of debris shall be scheduled with additional collection and disposal of debris provided whenever the periodic schedule is inadequate to prevent accumulation. Overloading of trucks carrying disposal shall be prohibited. Rubbish transportation shall conform to local and/or state requirements.

C. Periodic inspections shall be provided to enforce requirements.

3.3 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Remove tools, construction equipment, machinery, and surplus material from Project site.
c. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
d. Remove labels that are not permanent.
e. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
f. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
g. Remove grease, mastic, adhesive, dust, dirt, stains, fingerprints, labels, concrete and other foreign materials from visible interior and exterior surfaces.
h. Prior to final completion, the Contractor shall conduct an inspection of interior and exterior surfaces, and all work areas to verify that the entire work is clean.
i. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 01 74 00

CLEANING

PART ONE - GENERAL

1.01 GENERAL:

A. Maintain premises free from accumulations of waste, debris, and rubbish caused by construction operations.
B. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials. Clean all sight-exposed surfaces. Leave project clean and ready for occupancy.

1.02 REQUIREMENTS OF REGULATORY AGENCIES:

A. Codes and Standards: Applicable federal, state, and local codes and regulations relative to environmental safety regulations.
B. Hazards Controls: Store volatile waste in covered metal containers and remove from premises daily. Prevent accumulation of wastes which create hazardous conditions.
C. Pollution Control: Conduct clean-up and disposal operations to comply with local ordinances and anti-pollution laws.
   1. Burning or burying of rubbish and waste materials on the project site is prohibited.
   2. Disposal of volatile fluid wastes (such as mineral spirits, oil, or paint thinner) in storm or sanitary sewer systems or into streams or waterways is prohibited.

PART TWO - PRODUCTS

2.01 CLEANING MATERIALS:

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART THREE - EXECUTION

3.01 DURING CONSTRUCTION:

A. Keep work area and all occupied property in neat and orderly condition at all times. Oversee cleaning and ensure that building and grounds are maintained free from accumulations of waste materials and rubbish. Sprinkle dusty debris with very fine water mist to control accumulation of dust. Do not use water in quantity so as to puddle. Do not allow waste and other materials such as rubbish, debris, wrappers, etc., to accumulate and become unsightly or hazardous. Promptly remove equipment and excess materials as they become no longer needed for the progress of the work. At not less than every day during progress of work, clean up work and access areas and dispose of waste materials, rubbish, and debris. Legally dispose of waste materials, rubbish, and debris at public or private dumping areas off Owner's property. At the completion of work, restore work area to its original

condition. Lower waste materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights. Keep street and access to site free of rubbish and debris.

B. Contractor shall be responsible for damage to or destruction of property of any sort resulting from the work or caused by defective work, or the use of unsatisfactory materials or workmanship.
C. Contractor shall be responsible for the preservation of all private property, trees, fences, etc., along the adjacent street, right-of-way, etc., and shall use every precaution necessary to prevent damage or injury thereto. Use suitable precautions to prevent damage to pipes, conduits, and other structures.
D. If damage to any structures, utilities, or other improvement occurs by reason of Contractor's operations even though special precautions have been employed, Contractor shall be entirely responsible for such damage and shall make all repairs as required to the satisfaction of Owner.
E. Do not injure, destroy, or trim landscaping without authorization by Owner. Landscaping damage will be replaced by Contractor with new stock or with other stock satisfactory to Owner at the expense of Contractor.

3.02 FINAL CLEANING:

A. Employ skilled workmen for final cleaning.
B. Remove grease, mastics, adhesives, dust, dirt, stains, labels, and other foreign materials from sight-exposed exterior surfaces.
C. Repair, patch, and touch-up marred surfaces to match adjacent finishes.
D. Broom clean paved surfaces; rake clean other surfaces of grounds.
E. Clean set up and storage area.
F. Prior to final completion or Owner occupancy, conduct an inspection of sight-exposed interior and exterior surfaces and all work areas to verify that entire Work area is clean.

END OF SECTION 01 74 00

SECTION 02 40 00

MINOR DEMOLITION AND RENOVATION WORK

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Removal of existing deteriorated asphalt pavement.
B. Removal of existing deteriorated concrete sidewalks.
C. Removal of sealants in locations where sealants are to be replaced.
D. Removal of signage at designated locations.
E. Removal of existing precast concrete wheel stops prior to starting the asphalt pavement repairs. Reinstall the wheel stops at the completion of the repairs. Replace broken or damaged wheel stops during removal and reinstallation.
F. All other miscellaneous and incidental work required to perform asphalt pavement repairs and concrete sidewalk repairs as specified and to obtain specified manufacturer's warranty.

1.02 RELATED SECTIONS:

A. 03 30 00 – Cast in Place Concrete
B. 03 61 00 – Concrete Rehabilitation
C. 07 92 00 – Sealants and Caulking
D. 32 01 17 – Asphalt Pavement Repairs
E. 32 11 27 – Reworking Flexible Base Material
F. 32 12 36 – Seal Coats on Asphalt Pavement

1.03 REFERENCES:

A. American Society for Testing and Materials (ASTM).
B. Corps of Engineers (CRD).

1.04 PROJECT CONDITIONS:

A. Environmental Requirements:
   1. Do not remove existing asphalt pavement or concrete sidewalks in inclement weather or when rain is predicted with 30 percent possibility.
B. Emergency Equipment: Maintain on-site materials necessary to apply emergency temporary patches in event of sudden storms or inclement weather.
C. Smoking is prohibited on all of FAA property.

1.05 SEQUENCING AND SCHEDULING:

A. Sequence minor demolition and renovation with sequence of new work.
B. Coordinate work with Owner's operational requirements.

1.06 WARRANTY:

A. Provide Contractor's warranty covering defects in installed materials and workmanship for period of two years from date of final acceptance.

PART TWO - PRODUCTS

2.01 MATERIALS:

A. Treatment for Wood Members: Pressure preservative treated in accordance with AWPA C2, C9 standards, Ground Contact using ACQ, MCQ at 0.40 pounds (0.1kg) per cubic foot (0.03cm) wood above ground 0.25 pcf.

B. Lumber for Nailers and Blocking: Standard Grade Fir or No. 2 Southern Yellow Pine bearing UL label; size shall be appropriate for application, minimum 2-inch (50mm) (nominal) thickness, kiln dried after treatment.

C. Fasteners:

1. Concrete Substrate:
   a. Fasteners for securing sheet metal items such as surface-mounted counterflashings, termination/compression bars, etc., to concrete substrate shall be a pre-assembled drive anchor with a stainless steel drive screw, a lead/zinc alloy expansion anchor body (1/4-inch (6mm) diameter, 1-1/2-inch [38mm] length) and a stainless steel washer with integral rubber seal (1-1/8-inch diameter) such as "Zamac Hammer-Screw" as manufactured by Powers Fasteners, Inc.
   b. Fasteners for securing wood blocking to concrete substrate shall be sleeved stud expansion bolt, 1/2-inch (13mm) diameter (minimum), with 3/4-inch diameter steel washer such as "Kwik Bolt II" by Hilti, "Tru Bolt Wedge" by ITW Ramset, or "Lok/Bolt" by Powers Fasteners, Inc. Fasteners for securing wood blocking to concrete substrate for miscellaneous applications shall be 1/4-inch diameter, 2-3/4-inch long coated screw with hex head such as "Tapcon" by ITW Buildex.
2. Steel Substrate:
   a. Fasteners for securing plywood to steel substrate shall be self-drilling, 1-1/2-inch long coated No. 10 screw with wafer head such as "Traxx Wood to Metal Fastener" by ITW Buildex.
   b. Fasteners for securing steel to steel substrate shall be self-tapping No. 14, 1-1/2-inch long stainless steel screw with stainless steel washer and bonded integral rubber seal.

PART THREE - EXECUTION

3.01 EXAMINATION:

A. Examine existing facility to determine existing physical conditions that affect removal of existing materials and installation of new materials.

B. Verify that required barricades and other protective measures are in place.

3.02 PREPARATION:

A. Protect adjacent surfaces.

3.03 MINOR DEMOLITION OPERATIONS:

A. Execute demolition in careful and orderly manner with least possible disturbance or damage to adjoining surfaces and structure.
B. Avoid excessive vibrations in demolition procedures that would be transmitted through finish materials.
C. Asphalt Pavement Removal:
   1. Perform vertical sawcuts full depth around perimeters of areas to be removed.
   2. Remove existing asphalt pavement to the existing base course.
   3. Do not stockpile debris on site. Promptly dispose of demolished materials at authorized disposal site each day.
   4. Prepare and recompact existing base course in areas to receive new pavement.
D. Concrete Sidewalk Removal:
   1. Perform sawcuts into the concrete sidewalks at existing contraction joints at the perimeters of sidewalk areas to be removed.
   2. Break up existing concrete, taking care to not damage adjacent concrete to remain.
   3. Remove existing concrete to the existing base course.
   4. Do not stockpile debris on site. Promptly dispose of demolished materials at authorized disposal site each day.
   5. Prepare and recompact existing base course in areas to receive new sidewalks.

3.04 MINOR RENOVATION WORK:

A. Nailers:
   1. Install treated wood blocking as joint filler in new construction joints.
   2. Clean and prepare existing surfaces to receive wood blocking.

3.05 CLEANING:

A. Materials, equipment, and debris resulting from demolition operations shall become property of Contractor. Remove and dispose of demolition debris in accordance with applicable city, state, and federal laws at authorized disposal site.
B. Leave substrate clean and dry, ready to receive new materials.

END OF SECTION 02 40 00

SECTION 03 20 00

CONCRETE REINFORCEMENT

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. All labor, materials, tools, equipment, and services for all concrete reinforcement as indicated, including steel reinforcing bars, dowels, and accessories for cast-in-place concrete, in accordance with provisions of Contract Documents.
B. Completely coordinate with work of all other trades.
C. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure, and complete installation.

1.02 RELATED SECTIONS:

A. 03 30 00 - Cast-in-place Concrete.

1.03 REFERENCE STANDARDS:

A. ACI 318, Building Code Requirements for Reinforced Concrete.
B. ACI SP-66, American Concrete Institute - Detailing Manual.
C. ACI 315, Details and Detailing of Concrete Reinforcement.
D. ASTM A 82, Cold Drawn Steel Wire for Concrete Reinforcement.
E. ASTM A 185, Welded Steel Wire Fabric for Concrete Reinforcement.
F. ASTM A 615, Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
G. CRSI Concrete Reinforcing Steel Institute - Manual of Practice.
H. CRSI 63, Recommended Practice for Placing Reinforcing.
I. CRSI 65, Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

1.04 QUALITY ASSURANCE:

A. Bars Used for Concrete Reinforcement Shall Meet Following Requirements for Fabricating Tolerances:
   1. Sheared Length: Plus or minus 1-inch (25mm).
   2. Depth of Bars: Plus or minus 1/2-inch (13mm).
   3. Overall Dimensions of Stirrups, Ties, and Spirals: Plus or minus 1/2-inch (13mm).
   4. All Other Bends: Plus or minus 1-inch (25mm).
B. Place Bars to Following Tolerances:
   1. Clear Distance to Formed Surfaces: Plus or minus 1/4-inch (6mm).
   2. Minimum Spacing Between Bars: Minus 1/4-inch (6mm).

3. Top Bars in Slabs and Beams:
   a. Members 8-inches (200mm) Deep or Less: Plus or minus 1/4-inch (6mm).
   b. Members Between 8-inches and 2 feet (200mm and 600mm) Deep: Plus or minus 1/2-inch (12mm).
4. Crosswise of Members: Spaced evenly within 2-inches (50mm).
5. Lengthwise of Members: Plus or minus 2-inches (50mm).

C. Bars may be moved as necessary to avoid interference with other reinforcing steel or embedded items. If moved more than one bar diameter or enough to exceed above tolerances, resulting arrangement of bars subject to approval.

1.05 SUBMITTALS:

A. Provide submittals in accordance with Section 01 33 00 - Submittals.
B. Product Data: Submit manufacturer's product data, surface preparation, and installation procedures, and Material Safety Data Sheets (SDS) for each product required.
C. Manufacturer's Certificates: Certify that products meet or exceed specified requirements.
D. Shop Drawings:
   1. Submit Shop Drawings prior to fabrication, showing sizes, locations, dimensions, and quantities of reinforcing steel, dowels, and accessories, in sufficient detail to permit installation of reinforcing without reference to Contract Drawings.
   2. Submit bending and cutting schedules, splicing, and supporting and spacing devices.
   3. Details of concrete reinforcement and accessories not shown on Contract Documents must be in accordance with ACI 315.

PART TWO - PRODUCTS

2.01 MATERIALS:

A. Reinforcing - General: Unfinished deformed billet steel bars, Grade 60 KSI, conforming to ASTM A615, Standard Specifications for Deformed and Plain Billet, Steel Bars for Concrete Reinforcement including Supplementary Requirements, and Supplementary Requirement S1.
B. Dowel Bars: Conform to ASTM A615, Grade 60. Unless otherwise indicated, use 1/2-inch (13mm) diameter smooth dowels, 6-inch (150mm) embedment, spaced approximately 18-inches (450mm) on-center.

2.02 ACCESSORY MATERIALS:

A. Tie Wire: Minimum 16 gauge annealed type.
B. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic, plastic coated steel, or stainless steel type; size and shape as required for strength and support of reinforcement during concrete placement conditions.
C. Epoxy Adhesive: Structural epoxy paste adhesive, typified by Sika "Sikadur 31, Hi-Mod Gel", or approved equal.

PART THREE - EXECUTION

3.01 FABRICATION:

A. Fabricate concrete reinforcing in accordance with CRSI Manual of Practice, ACI SP-66, ACI 318, ACI 315, and ASTM A 185.
B. Fabricate reinforcement to shapes and dimensions shown, placed where indicated, and adequately supported during concrete placement.

3.02 PLACING REINFORCEMENT:

A. Provide minimum concrete covering for reinforcement in accordance with ACI 318, and as follows:
   1. Concrete Deposited Against Earth: 3-inches (75mm).
   2. Formed Surfaces Exposed to Weather or in Contact With Earth: 1·1/2-inches (37mm).
B. Ensure that all reinforcement, at time concrete is placed, is free of materials that may adversely affect or reduce bond, including loose rust or mill scale, soil, oil, grease, or other coatings which may reduce the bond with the concrete. Reinforcement with rust, mill scale, or a combination of both will be accepted as being satisfactory without cleaning or brushing provided dimensions and weights, including heights of deformations, or a cleaned sample is not less than required by applicable ASTM.
C. Accurately position, support, and fasten together all reinforcement and supports to prevent displacement by construction loads or placing of concrete beyond tolerances indicated.
   1. Where concrete surface will be exposed to weather in finished structure, furnish all accessories of noncorrosive material or protect against corrosion.
   2. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
   3. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
   4. Do not place reinforcing bars more than 2-inches (50mm) beyond the last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
   5. Support reinforcing steel at 4 feet (1.2m) on-center, minimum.

D. All splices not specifically indicated shall be subject to approval. Mechanical connectors for reinforcing bars may be used subject to approval.
E. Splices in reinforcement steel shall be in accordance with approved splicing procedures and the requirements of ACI 318.
F. Do not bend reinforcement after embedding in hardened concrete unless permitted by COR/RE.

3.03 DOWEL INSTALLATION

A. Notify COR/RE of any substrate conditions which could affect the successful installation of new dowels.
B. Drill hole in concrete substrate to receive new dowel 1/8-inch (3mm) greater in diameter than the dowel, or in accordance with epoxy adhesive manufacturer's recommendations, and deep enough to provide for minimum embedment.
C. Minimum depth of embedment for new dowels is 6-inches (150mm).
D. Exercise caution to prevent concrete spalling on the far side of the concrete substrate. Repair spalls resulting from the drilling and dowel installation.
E. Minimum substrate and ambient temperature is 40 degrees Fahrenheit (4 degrees Celsius) for epoxy adhesive installation.
F. Keep substrate dry and free of dust, loose concrete, oil, grease, or other foreign materials.
G. Mix epoxy adhesive in accordance with manufacturer's written instructions.
H. Grout in dowels with neat epoxy adhesive.
I. Allow epoxy adhesive to cure a minimum of forty-eight hours.
J. Wrap ends of the exposed dowels where shown on the Drawings.

END OF SECTION 03 20 00

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. All labor, materials, tools, equipment, and services to construct new sidewalks in accordance with provisions of the Contract Documents.
B. Install new steel dowels in existing adjacent concrete sidewalks and curbs.

1.02 RELATED SECTIONS:

A. 02 40 00 - Minor Demolition and Renovation Work.
B. 03 20 00 - Concrete Reinforcement.
C. 07 92 00 – Sealants and Caulking.

1.03 REFERENCES:

A. American Concrete Institute (ACI) 301.
B. American Society for Testing and Materials (ASTM).

1.04 SUBMITTALS:

A. Provide submittals in accordance with Section 01 33 00 - Submittals.
B. Mix Designs:
   1. Submit proposed mix design from laboratory trial batch or field experience in accordance with ACI 301, for each class of concrete to for review.
   2. Submit laboratory test results for concrete materials and mix design test.
   3. Submit proposed mix designs at least seven days prior to start of work. Do not place concrete until mix designs have been approved by CO.
C. Materials Certificates: Submit material certificates in lieu of laboratory test reports when permitted by CO. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.
   1. Cementitious materials, including supplemental cementitous material.
   2. Provide certification from admixture manufacturers that products conform to reference standards specified.
   3. Aggregates, including gradation and combined gradation.
D. Submit product data and Material Safety Data Sheets (SDS) for all materials proposed for use, including reinforcement and forming accessories, admixtures, curing compounds, and other materials.

E. Submit Shop Drawings for fabrication, bending, and placement of concrete reinforcement.
F. Curing Method: Submit proposed curing method, materials, and procedures to be used to RE/COR for review.

1.05 QUALITY ASSURANCE:

A. Perform engineering elevation survey of work area to establish and maintain grade control at all times during construction.
B. Engage testing laboratory acceptable to Owner to perform material evaluation tests and to design concrete mixes.
C. Materials and installed work may require testing and retesting at anytime during the progress of the Work. Perform tests, including retesting of rejected materials for installed work, at Contractor's own expense.

1.06 PROJECT CONDITIONS:

A. Protect adjacent existing construction during concrete placement.
B. Do not place concrete when temperature is below 40 degrees Fahrenheit (4 degrees Celsius) and falling. Concrete may be placed when temperature is above 35 degrees Fahrenheit (2 degrees Celsius) and rising. Measure ambient temperature away from artificial heat, with thermometer or measuring device shaded from solar effects.

PART TWO - PRODUCTS

2.01 CONCRETE MATERIALS:

A. Portland Cement:
   1. ASTM C 150, Type I, Normal.
B. Coarse Aggregate: Durable particles of crushed limestone meeting the requirements of ASTM C 33.
   1. Slab on Grade: Aggregate size shall meet ASTM C 33 Size No. 57 limits (1-inch [25mm] maximum).
C. Fine Aggregate: Clean, hard durable sand, free of salt and alkali, meeting the requirements of ASTM C 33.
D. Water: Clean and free from injurious amounts of oil, salt, acid, alkali, organic matter, or other deleterious substances. Water suitable for drinking is acceptable.
E. Admixtures: Do not use admixture types not listed.
   1. Air-Entraining Admixtures, ASTM C 260.
   2. Chemical Admixtures, ASTM C 494:
      a. Type A - Water Reducing Admixtures.
      b. Type D - Water Reducing and Retarding Admixtures.
      c. Admixtures shall not contain more than 0.1 percent chloride ions.
F. Water: Clean, potable, and free from deleterious material.

2.02 CONCRETE MIX:

A. Concrete Proportioning: Proportion concrete in accordance with ACI 301.3.9, proportioning on the basis of previous field experience on trial mixtures.

B. Mix Design: The concrete mix design report shall include:
   1. Proposed saturated surface dry (SSD) weights per cubic yard.
   2. Cement manufacturer and type.
   3. Aggregate type and material properties.
   4. Design water cement ratio, slump, and air content.
   5. Water cement ratio versus compressive strength curve or history of mix performance.
   6. Design twenty-eight day compressive strength.
   7. Concrete supplier and address of plant designated for production.

C. Concrete Properties: Concrete shall exhibit the following properties:
   1. Concrete for Slab on Grade:
      a. Minimum Compressive Strength at Twenty-eight Days: 3,500 pounds per square inch.
      b. Air Content: 4 to 6 percent.
      c. Slump: 3 to 5 inches (50mm to 75mm).
      d. Maximum Water/Cement Ratio: 0.55.
      e. Minimum Cement Content: 564 pounds/cubic yard.

2.03 BONDING AGENT:

A. Multi-component, water based epoxy resin and Portland cement bonding agent. Approved product includes Sika “Armatec 110”, or approved equivalent.

PART THREE - EXECUTION

3.01 EXAMINATION:

A. Verify that dowels, reinforcement, and other items to be cast into concrete are accurately placed, held securely, and will not cause hardship in placing concrete.

B. Verify requirements for concrete cover over reinforcement

C. Verify the elevation and location of the existing underpinned grade beam is correct.

3.02 PREPARATION:

A. Prepare previously placed or existing concrete by cleaning with high pressure waterblasting or other approved mechanical methods. Apply and cure bonding agent in accordance with manufacturer's instructions. Ensure that surface is clean, sound, and damp, but free of standing water.

B. Existing concrete surfaces against which concrete is to be placed must be free from standing water, mud and debris. Surfaces shall be clean and free from oil, objectionable coatings, and loose or unsound material.

C. Verify subgrade is acceptable. Hand trim and shape the sides and bottoms of earth forms for slab-on-grade. Remove loose and unsuitable soil.

3.03 FORMWORK AND REINFORCEMENT:

A. Verify lines and levels for formwork.
B. Align form joints.
C. Place, support, and secure reinforcement and embedded items against displacement.
D. In locations where new concrete is doweled to existing work, drill holes in existing concrete and insert steel dowels in epoxy adhesive.

3.04 MIXING AND PRODUCTION OF CONCRETE:

A. Batch, mix, and transport ready-mixed concrete in accordance with ASTM C94. Plant equipment and facilities shall conform to “Check List for Certification of Ready Mixed Concrete Production Facilities” of the National Ready Mixed Concrete Association.
B. Site batched and mixed concrete will be permitted only after ability to control quality has been demonstrated to the satisfaction of RE/COR.

3.05 MIXING - CONTROL OF ADMIXTURES:

A. Charge air-entraining admixtures and other chemical admixtures into mixer as solutions. Measure by means of an approved mechanical dispensing device. Liquid added shall be considered a part of mixing water. Admixtures that cannot be added in solution may be weighed or measured by volume if so recommended by manufacturer.
B. If two or more admixtures are used, add them separately to avoid possible interaction that might interfere with efficiency of either admixture, or adversely affect concrete.
C. Complete addition of retarding admixtures within one minute after addition of water to cement has been completed, or prior to beginning of last three quarters of required mixing, whichever comes first.

3.06 MIXING - TEMPERING AND CONTROL OF MIXING WATER:

A. Mix concrete only in quantities for immediate use. Discard concrete which has set.
B. When concrete arrives at project with slump below that suitable for placing, water may be added only if neither maximum permissible water-cement ratio nor maximum slump is exceeded. Incorporate water by additional mixing equal to at least half of total mixing required. Accomplish addition of water above that permitted by limitation on water-cement ratio by adding a quantity of cement sufficient to maintain proper water-cement ratio, if authorized by RE/COR.

3.07 MIXING - WEATHER CONDITIONS:

A. Cold Weather: Comply with ACI 306.

1. In cold weather, minimum concrete temperature when delivered at site shall conform to following limitation (degrees Fahrenheit [degrees Celsius]).

Air Temperature at Time of Pour, Degrees Fahrenheit (Celsius)	For Sections With Least Dimension Less Than 12-inches	For Sections With Least Dimension Less Than 12-inches
30 to 45 (-1 to 7)	60 (16)	50 (10)
15 to 30 (-9 to -1)	65 (18)	55 (13)
0 to 15 (-18 to -9)	70 (21)	60 (16)
Within 24 hours		
Below 32 (0)	60 (21)	50 (10)

2. If water or aggregate is heated above 100 degrees Fahrenheit (37 degrees Celsius), combine water with aggregate in mixer before cement is added. Do not mix cement with water or with mixtures of water and aggregate having a temperature greater than 100 degrees Fahrenheit (37 degrees Celsius). Final temperature of combined mix shall not exceed 90 degrees Fahrenheit (32 degrees Celsius) or be high enough to cause flash set or loss of slump and workability.

B. Hot Weather: Comply with ACI 305. Cool ingredients before mixing or add flake ice or well crushed ice of a size that will melt completely during mixing for all or part of mixing water if, due to high temperature, low slump, flash set, or cold joints are encountered.

3.08 PREPARATION BEFORE PLACING:

A. Equipment:

1. Remove hardened concrete and foreign material from inner surfaces of conveying equipment.
2. Provide spare vibrator on jobsite during all concrete placing operations.
3. In cold weather, have protective blankets ready and heaters operational and in-place before placing concrete.

B. Forms:

1. Complete formwork; remove water and foreign material; secure reinforcement in place; and have entire preparation inspected prior to concrete placement.
2. In hot weather when temperature of reinforcing or forms is greater than 120 degrees Fahrenheit (49 degrees Celsius), spray forms and reinforcement with water just prior to placing concrete.

C. Screeds and Edge Forms:

1. Set edge forms and intermediate screed strips accurately to produce designated elevations and contours of finished surface. Use of "wet screeds" will not be permitted. Provide, at no additional cost to Owner, extra concrete (increased thickness) as necessary to produce finished surfaces within specified tolerances at

the designated elevations and contours. Make formwork sufficiently strong to support vibrating screeds or roller pipe screeds, if nature of finish specified requires use of such equipment. Align concrete surfaces to contours of screed strips by use of strike-off templates or approved compacting type screeds.

2. When formwork is cambered, set edge forms and screeds to like camber to maintain proper concrete thickness.

D. Subgrade for Slabs-on-Grade:
   1. Subgrade shall be well drained and of adequate and uniform loadbearing nature. Keep density of in-place subgrade soils to minimum indicated.
   2. Keep subgrade free of frost before concrete placing begins.
   3. Keep subgrade moist at time of concrete placement. If necessary, dampen with water in advance of concrete placement. Allow no free water standing on subgrade nor any muddy or soft spots when concrete is placed.

3.09 CONVEYING:

A. Handle concrete from mixer to place of final deposit as rapidly as practicable by methods which prevent segregation or loss of ingredients and ensure that quality is maintained.

B. Use equipment conforming to ASTM C94.

C. Use horizontal belt conveyors or mount at a slope which will not cause excessive segregation or loss of ingredients.
   1. Protect concrete against undue drying or rise in temperature.
   2. Handle to prevent segregation.
   3. Do not allow mortar to adhere to belt.
   4. Discharge long runs into a hopper through a baffle.

D. Use metal or metal-lined chutes with slope between 1 vertical and 2 to 3 horizontal.
   1. Chutes more than 20 feet (6m) long and chutes not meeting slope requirements may be used provided they discharge into a hopper before distribution.

E. Pumping or pneumatic conveying equipment shall be of suitable kind with adequate pumping capacity.
   1. Control pneumatic placement so that segregation is not apparent in discharged concrete.
   2. Loss of slump in pumping or pneumatic conveying equipment shall not exceed 2-inches (50mm).
   3. Do not convey concrete through pipe made of aluminum or aluminum alloy.

3.10 DEPOSITING CONCRETE IN FORMS:

A. Deposit concrete continuously or in layers of such thickness that no concrete is deposited on concrete which has hardened sufficiently to cause formation of seams or planes of weakness within section. Place at such a rate that concrete being integrated with fresh concrete is still plastic. Do not deposit concrete which has partially hardened or has been contaminated by foreign materials. Remove temporary spreaders in forms when concrete placing has reached an elevation rendering their service unnecessary.

B. Deposit concrete as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to any procedure that will cause segregation. Do not drop concrete more than 6 feet (2m). Provide chutes, spouts, tremies, or other approved devices.
C. Consolidate all concrete by vibration so that concrete is thoroughly worked around reinforcement, around embedded items, and into corners of forms eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. Use internal vibrator having a minimum frequency of 8000 vibrations per minute to consolidate concrete effectively. Do not use vibrators to transport concrete within forms. Insert vibrators and withdraw at points approximately 18-inches (450mm) apart. At each insertion, allow duration sufficient to consolidate concrete but not sufficient to cause segregation; generally from five to fifteen seconds. Where concrete is to have an as-cast finish, bring a full surface of mortar against form by vibration process, supplemented if necessary by spading, to work coarse aggregate back from formed surface.

3.11 SLAB PLACEMENT:

A. Coordinate mixing and placing with finishing. Do not place concrete on subgrade or forms more rapidly than it can be spread, straightedged, and darbled or bull floated. Perform these operations before bleeding water has an opportunity to collect on surface.
B. To obtain good surfaces and avoid cold joints, plan size of finishing crews with due regard for effects of concrete temperature and atmospheric conditions on rate of hardening of concrete. If construction joints become necessary, construct as required under joints and embedded items.
C. Locate joints in slabs-on-grade as indicated. If saw-cut joints are required or permitted, time cutting properly with set of concrete. Start cutting as soon as concrete has hardened sufficiently to prevent aggregates being dislodged by saw. Complete before shrinkage stresses become sufficient to produce cracking.
D. Thoroughly consolidate concrete in slabs. Use internal vibration in beams and girders of framed slabs and along bulkheads of slabs on grade. Obtain consolidation of slabs with vibrating screeds, roller pipe screeds, internal vibrators, or other approved means.

3.12 CONCRETE PLACEMENT:

A. Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten forms (if used) immediately before placing concrete where form coatings are not used.
B. Remove wood chips, sawdust, and other debris before concrete is placed.
C. Moisten subgrade soils prior to placing concrete. Allow no standing water on the subgrade, nor any soft or unsuitable subgrade soils at time of concrete placement.
D. Batch and deliver concrete in conformance with the requirements of ACI 304 and ASTM C 94.

E. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified herein. Deposit concrete as nearly as practicable to its final location to avoid segregation.
F. All concrete not placed within ninety minutes after mixing will be rejected and is to be disposed of off-site by the Contractor at his own expense. Concrete that has developed initial set before placement will be rejected and disposed of off-site by Contractor at his own expense.
G. Deposit concrete in forms in horizontal layers and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
H. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
I. Consolidate concrete during placement operations so that concrete is completely worked around reinforcement, dowels, corners, and adjacent concrete.
J. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6-inches (150mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix. Do not over vibrate.
K. Bring new concrete surfaces to correct level. Strike off and screed concrete to produce a concrete section that is thoroughly compacted and finished to the specified line, grade, and cross sections. New concrete surfaces to be flush with adjacent existing concrete surfaces.
L. Maintain reinforcing in proper position during concrete placement operations.
M. Cold Weather Placing:
    1. Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as specified.
    2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
    3. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
P. Hot Weather Placing:
    1. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
    2. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions.

3.13 CONSTRUCTION AND CONTROL JOINTS:

A. Construction Joints:
   1. Locate construction joint at locations where concrete placement is terminated or interrupted.
   2. Provide keyed or doweled construction joints.
   3. Locate construction joints so as not to impair strength and appearance of the member, as acceptable to COR/RE.

B. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints, except as otherwise indicated.

C. Control Joints:
   1. Insert premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.
   2. If control joints are sawcut, time sawcutting properly with set of concrete. Begin sawcutting as soon as concrete has hardened sufficiently to prevent aggregates from being dislodged by saw.
   3. Control joints shall range from 1-1/4-inches (31mm) to 1-1/2-inches (38mm) in depth.
   4. At a minimum, provide control joints not exceeding 30 linear feet (10m).

D. Provide joint sealant in construction and control joints in accordance with Section 07 92 00 - Sealants and Caulking.

3.14 FINISH OF FORMED SURFACES:

A. Float surface to smooth finish.

B. After floating is complete and while concrete is still workable, test surface for trueness with an approved 10 foot (3m) long straightedge.
   1. Place straightedge on the concrete surface at 5 foot (1.5m) intervals transversely along the pavement surface to test the surface trueness.
   2. Advance straightedge forward 5 feet (1.5m) and repeat surface trueness test.
   3. Correct irregularities by adding or removing concrete and refloating the area.
   4. Repeat surface trueness test after refloating.
   5. Surface trueness tolerance is 1/4-inch (6mm) maximum in 10 feet (3m).

C. Pavement and Sidewalks: Provide broom finish with a uniform textured surface. Broom surface transversely to the direction of traffic.

D. Curbs: Trowel finish surface to match existing adjacent curb surfaces.

3.15 CONCRETE CURING AND PROTECTION:

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures and mechanical injury. Maintain with minimal moisture loss and relatively constant temperature for a minimum of three days.

B. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining cover (mats or fabric kept continuously wet) curing, or by combinations of the two methods.

3.16 CURING AND PROTECTION:

A. General: Beginning immediately after placement, protect concrete from premature drying, hot or cold temperatures, and mechanical injury, and maintain with minimal moisture loss at relatively constant temperature for period necessary for hydration and hardening of concrete. Materials and methods of curing subject to approval.

B. Preservation of Moisture:

1. For concrete surfaces not in contact with forms, apply one of following procedures immediately after completion of placement and finishing:
   a. Ponding or continuous sprinkling.
   b. Application of absorptive mats or fabric kept continuously wet.
   c. Application of sand kept continuously wet.
   d. Continuous application of mist spray (not exceeding 150 degrees Fahrenheit [66 degrees Celsius]).
   e. Application of sheet curing materials.
   f. Application of other moisture-retaining covering as approved.
   g. Application of curing compound. Apply in accordance with recommendations of manufacturer immediately after any water sheen which may develop after finishing has disappeared. Do not use on any surface against which additional concrete or other material is to be adhesively applied, unless it is proven that curing compound will not prevent bond unless positive measures are taken to remove it completely from areas to receive bonded applications.
2. Minimize moisture loss from surfaces placed against wooden forms or metal forms exposed to heating by sun by keeping forms wet until they can be safely removed. After form removal, cure concrete until end of time prescribed.
3. Continue curing Type I concrete for at least seven days; Type III concrete at least three days. If tests made of cylinders, kept adjacent to structure and cured by same methods, show average compressive strength has reached 70 percent of specified strength, moisture retention methods may be terminated. If one of the curing procedures indicated above is used initially, it may be replaced by one of the other procedures indicated at any time after concrete is one day old, provided concrete is not permitted to become surface dry during transition.

C. Temperature, Wind, and Humidity:

1. Cold Weather: When mean daily outdoor temperature is less than 40 degrees Fahrenheit (4 degrees Celsius) maintain temperature of concrete between 50 and 70 degrees Fahrenheit (10 and 21 degrees Celsius) for required curing period. When necessary, make arrangements for adequately heating, covering, insulating, or housing concrete work to maintain required temperature without injury. Do not use combustion heaters during first twenty-four hours unless precautions are taken to prevent exposure of concrete to exhaust gases that contain carbon dioxide.
2. Hot Weather: When necessary, make provision for windbreaks, shading, fog spraying, sprinkling, ponding, or wet covering with a light covered material. Take such protective measures as quickly as concrete hardening and finishing operations will allow.
3. Rate of Temperature Change: Keep changes in temperature of air immediately adjacent to concrete during and immediately following curing period as uniform as possible. Do not exceed 5 degrees Fahrenheit (3 degrees Celsius) in any one hour

or 50 degrees Fahrenheit (35 degrees Celsius) in any twenty-four hour period.

D. Protection from Mechanical Injury: During curing period, protect concrete from damaging mechanical disturbances such as load stresses, heavy shock, and excessive vibration. Protect all finished concrete surfaces from damage by construction equipment, materials, or methods, and by rain or running water. Do not load self-supporting structures in such a way as to overstress concrete.

E. Protection of Slabs-on-grade from Frost: Adequately protect interior slabs exposed to freezing temperatures so that frost does not develop in the supporting subgrade.

3.17 CONCRETE REPAIRS:

A. Bear cost of repairs to defective concrete or concrete not conforming to required lines, levels, details, and elevations.

B. As recommended by COR/RE, repair surfaces that contain defects that affect the durability or purpose of the concrete. If defects cannot be repaired, remove and replace concrete.

C. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects include crazing, cracks in excess of 0.02-inch (0.5mm) width or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, honeycomb, rock pockets, and other objectionable conditions.

3.18 QUALITY CONTROL TESTING DURING CONSTRUCTION:

A. Owner will employ a testing laboratory to perform sampling and testing for quality control during placement of concrete.

B. Sampling Fresh Concrete: ASTM C 172.

C. Additional Tests: The testing laboratory will make additional tests of in-place concrete when initial test results indicate specified concrete strength and other characteristics have not been attained in the structure. Testing laboratory may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42. Contractor shall pay for such test when unacceptable concrete is confirmed by cores.

3.19 EVALUATION OF CYLINDER STRENGTH TESTS:

A. Separately evaluate test results for standard molded and cured test cylinders for each concrete mix design. For evaluation of potential strength and uniformity, each concrete mix design. For evaluation of potential strength and uniformity, each mix design shall be represented by at least five tests.

B. Strength level of concrete will be considered satisfactory so long as averages of all sets of three consecutive strength test results equal or exceed specified strength, and no individual strength test result falls below specified strength by more than 500 psi.

3.20 TESTING CONCRETE IN PLACE:

A. When strength tests show deficiencies, testing of concrete in place may be required as an aid in evaluating actual strength. Contractor shall pay for all concrete tests and engineering time and analysis required to evaluate actual in-place concrete

strength made necessary by low-strength cylinder tests.

B. Testing by impact hammer, sonoscope, or other non-destructive device will be performed to determine relative strengths at various locations in structure as an aid for selecting areas to be cored. Such tests will not be used as a basis for acceptance or rejection unless properly calibrated and correlated with other test data.

C. Core Tests: Obtain and test largest practical diameter cores (2-inches [50mm]), minimum, in accordance with ASTM C 42. If concrete in structure will be dry under service conditions, air dry cores (temperature 60 degrees Fahrenheit to 80 degrees Fahrenheit [16 degrees Celsius to 26 degrees Celsius]), at relative humidity less than 60 percent for seven days before test. Test dry. If concrete in structure will be more than superficially wet under service conditions, test cores after moisture conditioning.
   1. Take at least three representative cores from each member or area of concrete in place that is considered potentially deficient. Location will be determined by COR/RE. If, before testing, one or more cores shows evidence of having been damaged subsequent to or during removal from structure, replace it.
   2. Concrete in area represented by a core test will be considered adequate if strength of cores is equal to at least 85 percent of, and if no single core is less than 75 percent of, specified strength.
   3. Fill core holes with low slump concrete or mortar.

3.21 ACCEPTANCE OF IN-PLACE CONCRETE:

A. Completed work which meets all applicable requirements will be accepted without qualification.
   1. Completed concrete work which fails to meet one or more requirements but which has been repaired in a manner acceptable to Owner's Representative to bring it into compliance will be accepted without qualifications.
   2. Completed concrete work which fails to meet one or more requirements and which cannot be, or has not been, brought into compliance will be considered rejected until remedied as provided in these Contract Documents.

B. Dimensional Tolerances:
   1. Formed surfaces resulting in concrete outlines smaller than permitted by tolerances are potentially deficient in strength and subject to provisions of strength requirements.
   2. Formed surfaces resulting in concrete outlines larger than permitted by tolerances may be rejected and excess material subject to removal. If removal of excess material is permitted, accomplish in such a manner as to maintain strength of section and to meet all other applicable requirements of function and appearance.
   3. Concrete members may be rejected if strength, appearance, or function of structure is adversely affected or if they interfere with other construction.
   4. Inaccurately formed concrete surfaces exceeding limits of tolerances and which are exposed to view may be rejected. Repair or remove and replace, if required.

C. Appearance:
   1. Architectural concrete with surface defects exceeding limitations will be rejected.
   2. Other concrete exposed to view with defects that adversely affect appearance of specified finish may be repaired only be approved methods.
   3. Concrete not exposed to view is not subject to rejection for defective appearance.

D. Strength of Structure: Strength of structure in place will be considered potentially deficient if it fails to comply with any requirements which control strength of structure including, but not necessarily limited to, the following:
   1. Low strength concrete.
   2. Reinforcing steel size, quantity, strength, position, or arrangement at variance with requirements on reinforcement.
   3. Concrete which differs from required dimensions or location in such a manner as to reduce strength.
   4. Curing less than that specified.
   5. Inadequate protection of concrete from extremes of temperature during early stages of hardening and strength development.
   6. Mechanical injury, construction fires, accidents, or premature removal of formwork likely to result in deficient strength.
   7. Workmanship likely to result in deficient strength.

3.22 REMEDIES FOR REJECTED WORK:

A. Structural analysis or additional testing will be required when strength of structure is considered potentially deficient.
   1. Core tests may be required when strength of concrete in place is considered potentially deficient.
   2. At Owner's option, if core tests are inconclusive or impractical to obtain or if structural analysis does not confirm safety of structure, load tests may be required and their results evaluated in accordance with ACI 318.

B. Remove and replace concrete work determined to be deficient by structural analysis or load test as directed by COR/RE at Contractor's expense.

C. At option and direction of Owner, in lieu of removal and replacement, reinforce deficient concrete as directed by COR/RE at Contractor's expense.

D. Contractor shall pay all costs incurred in providing additional testing and/or Engineering required to remedy potentially deficient concrete.

E. Repair or replace work rejected due to appearance or tolerance deficiencies, as directed, at no additional expense to FAA.

3.23 TRAFFIC:

A. Restrict traffic on new concrete sidewalks or pavement until concrete has achieved both of the following:
   1. A minimum compressive strength of 3,500 psi.
   2. Sidewalk or pavement is at least fourteen days old

END OF SECTION 03 30 00

SECTION 03 61 00

CONCRETE REHABILITATION

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Repairing concrete curb strainer in drainage trough inlet.
B. Furnishing all materials, tools, equipment, labor, and supervision to perform preparation and concrete rehabilitation as specified herein, and as required for a complete and proper installation.
C. Providing for the structural integrity and performance of the concrete repair, while maintaining the overall aesthetics of the facility.

1.02 RELATED SECTIONS:

A. 02 40 00 - Minor Demolition and Renovation Work.
B. 03 20 00 – Concrete Reinforcement
C. 07 92 00 - Sealants and Caulking.

1.03 SUBMITTALS:

A. Provide Submittals in accordance with Section 01 33 00 - Submittals.
B. Product Data: Submit manufacturer's technical data for each product, including recommendations for product application and use.
C. Submit manufacturer's written Safety Data Sheet (SDS) for each material used in this Section.
D. Prepare concrete repair mock-ups demonstrating appearance, color, texture, and finish of completed concrete repairs for each type of repair to be performed.

1.04 WARRANTY AND GUARANTEE:

A. Provide written materials guarantee for the longest period available, agreeing to repair or replace materials which fail to perform or appear to deteriorate in any manner not clearly specified as an inherent quality of the material according to the manufacturer's published data.
B. Provide two-year Contractor's warranty for labor and materials repaired or installed.

1.05 QUALITY ASSURANCE:

A. Installation Qualifications: Work must be performed by a firm having not less than five years successful experience in comparable concrete restoration projects and employing personnel skilled in comparable restoration processes and operations.

PART TWO - PRODUCTS

2.01 CONCRETE REPAIR MATERIAL:

A. Form and Pour Applications: Portland cement repair mortar, typified by
   1. "Sikacrete 211 SCC" mortar by Sika.
   2. "Master Emaco One Mix Base" with "Self-Consolidation Additive" by BASF.
   3. "EucoRepair SCC" by The Euclid Chemical Company.
   4. Or approved equal.

2.02 REINFORCING STEEL COATING:

A. Multi-component, polymer modified cementitious coating, typified by
   1. "Armatec 110" by Sika
   2. "Master Emaco P 124" by BASF.
   3. "DuralPrep A.C." by The Euclid Chemical Company.
   4. Or approved equivalent.

2.03 DOWELS:

A. Dowel: Unfinished deformed billet steel bar, Grade 60 KSI, conforming to ASTM A615, Standard Specifications for Deformed and Plain Billet, Steel Bars for Concrete Reinforcement, 3/8-inch diameter.

2.04 WATER:

A. Water: Clean potable water, free of oil, acid, alkali, and organic matter.

2.05 EPOXY ADHESIVE:

A. "Sikadur 31 Hi Mod Gel" by Sika.
B. "Master Emaco ADH 1420" by BASF.
C. "Dural 452 Gel" by The Euclid Chemical Company.

PART THREE - EXECUTION

3.01 PREPARATION:

A. Report in writing to the COR/RE, any conditions or surfaces which may adversely affect the installation. Do not proceed with Work until unsatisfactory conditions are corrected. Commencement of work implies acceptance of substrate and environmental conditions.
B. Use mechanical means to break out and remove all deteriorated, loose, or spalled material.
C. Chip remaining intact concrete in repair area until sound, clean concrete substrate is obtained. Remove loose concrete and dust with water or air under pressure.
D. Provide surfaces to be repaired free of defects and all laitance, dirt, dust, grease, efflorescence, paint, or other foreign material, with a minimum surface roughness profile of 1/16-inch.
E. Cut and remove existing exposed steel reinforcing bar in the adjacent concrete curb.

3.02 DOWEL INSTALLATION

A. Install “hairpin” dowel in concrete trough.
B. Prepare concrete surfaces adjacent to the repair area.
C. Pre-drill dowel holes in substrate.
D. Install new steel dowel with epoxy adhesive.

3.03 APPLICATION OF PROTECTIVE COATING TO REINFORCING STEEL AND CONCRETE:

A. Mix coating material in accordance with manufacturer's written instructions.
B. Provide adjacent concrete surfaces in a saturated surface dry condition with no standing water.
C. Brush apply coating material 10 to 20 mils thick to all surfaces of clean, exposed reinforcing steel and connection plates. Overlapping onto the concrete surface is expected.
D. Allow coating to dry approximately two to six hours, and apply second 10 to 20 mil coat to reinforcing steel and connection plates.
E. Brush apply 20 mil coating to prepared concrete substrate.
F. Do not apply protective coating when ambient and surface temperatures are less than 40 degrees Fahrenheit, or greater than 85 degrees Fahrenheit.
G. Allow coating to dry in accordance with manufacturer's written instructions prior to applying repair material.

3.04 APPLICATION OF CONCRETE REPAIR MATERIAL:

A. Construct form around repair area to prevent loss of concrete repair materials.
B. Saturate clean substrate to receive repair material. Provide a surface in a saturated surface dry condition. Remove all standing water.
C. Mix concrete repair material in accordance with manufacturer's written instructions.
D. Apply mortar to substrate with a stiff brush, filling all voids and pores, forcing material against substrate surface.
E. Place concrete repair material into prepared form. Completely fill form with concrete repair material. Rod or vibrate concrete repair material to achieve material flow, compaction, and to avoid entrapped air.
F. Screed off and trowel repair to level or to match existing lines. Use soft sponge to float surface if required.
G. Remove form after concrete repair material has achieved final set.
H. Keep repair damp for thirty minutes after installation to complete curing if required by the manufacturer. Protect repair from rapid drying due to high heat or wind.
I. After material has hardened, place wet burlap bags or construction paper over repaired area.
J. Do not apply material in direct heat of sun, frost-filled substrates, or when the ambient and surface temperatures are less than 45 degrees Fahrenheit.

3.05 SEALANT:

A. Seal base of repair and joint with existing curb with sealant, Type “B”.

END OF SECTION 03 61 00

SECTION 07 92 00

SEALANTS AND CAULKING

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Sealant application in control joints in existing and new concrete sidewalks.
B. Sealant application in joints between curbs and sidewalks.
C. Sealant application in curb-to-curb joints adjacent to sidewalks.

1.02 RELATED SECTIONS:

A. 02 40 00 - Minor Demolition and Renovation Work.
B. 03 30 00 - Cast-in-Place Concrete.

1.03 REFERENCES:

A. American Society for Testing and Materials (ASTM).
B. Federal Specifications (FS).

1.04 SUBMITTALS:

A. Product Data: Submit manufacturer's product data, Safety Data Sheets (SDS), joint preparation and installation instructions, and color charts for each product required.
B. Submit manufacturer's certification that products meet specified requirements and are appropriate for project applications.
C. Samples for Initial Selection Purposes: Submit manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available for each product exposed to view.

1.05 QUALITY ASSURANCE:

A. Product Labels: Include manufacturer's name, type of sealant, and color on labels of containers.
B. Single Source Responsibility for Joint Sealer Materials:
   1. Obtain joint sealer materials from single manufacturer for each different product required.
   2. Provide primers, joint sealers, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience as supplied and warranted by one manufacturer.
   3. Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.
C. Installer Qualifications: Installer having not less than five years successful experience in comparable projects and employing personnel skilled in operations required for project.

D. Field Sample: Upon directions of Owner/COR/ RE, prepare 12-inch (300mm) samples in presence of Owner demonstrating removal and cleaning process and application of sealant.
E. Use test methods standard with manufacturer to determine if priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealers to joint substrates under environmental conditions that will exist during actual installation.
F. Installer to perform field adhesion in peel testing using hand pull method. Perform a minimum of one test on every type of substrate and joint condition.
   1. Test Method: Test joint sealers by hand pull method described below:
      a. Install joint sealants in 3 feet (1m) joint lengths using same materials and methods for joint preparation and joint sealant installation required for complete work. Allow sealants to cure fully before testing.
      b. Make knife cuts as follows: A horizontal cut from one side of joint to the other followed by two vertical cuts approximately 2-inches (50mm) long at side of joint and meeting horizontal cut at top of 2-inch (50mm) cuts. Place a mark 1-inch (25mm) from top of 2-inch (50mm) piece.
      c. Use fingers to grasp 2-inch (50mm) piece of sealant just above 1-inch (25mm) mark; pull firmly down at a 90 degree angle or more while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for ten seconds.
   2. Report whether or not sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
   3. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of non-compliance with requirements, will be considered satisfactory. Do not use sealants which fail to adhere to joint substrate during testing.
   4. Repair test cut areas immediately after completion of testing work.
   5. Notify in advance and conduct adhesion testing in presence of COR/RE.
G. FAA reserves the right to perform testing of the installed work in accordance with AAMA 501.2-83, “Field Check of Metal Curtain Walls for Water Leakage”. Contractor shall repair all installed work found to be deficient and pay for repairs and additional testing as necessary until satisfactory test results are achieved.

1.06 DELIVERY, STORAGE, AND HANDLING:

A. Deliver materials in original containers with seals unbroken and labels intact.
B. Store materials in a single lockable area of project site.
C. Protect materials from extreme temperatures and exposure. Store in accordance with manufacturer's recommendations.

1.07 PROJECT CONDITIONS:

A. Environment: Comply with sealant manufacturer's recommended minimum and maximum installation temperatures and other weather protection.

1.08 SEQUENCING AND SCHEDULING:

A. Do not remove more sealant than can be replaced in same day.

1.09 WARRANTY:

A. Manufacturer's Warranty: Provide manufacturer's standard warranty for type of sealant specified.
B. Contractor's Warranty: Provide written warranty against leakage and defects in workmanship for a period of two years from date of final acceptance by FAA.

PART TWO - PRODUCTS

2.01 SEALANT:

A. Type A Sealant: Two component self-leveling polyurethane sealant for traffic areas, such as:
   1. “SikaFlex 2C SL” by Sika
   2. “MasterSeal SL 2” by BASF.
   3. “DynaTrol II Slope Grade” by Pecora
   4. Or approved equal.
   5. Color as selected by Owner.
B. Type B Sealant: Two-component non-sag polyurethane sealants for curb-to-curb joints, such as:
   1. “SikaFlex 2C NS TG” by Sika
   2. “MasterSeal NP 2” by BASF.
   3. “DynaFlex” by Pecora
   4. Or approved equal.
   5. Color as selected by Owner.

2.02 RELATED MATERIALS:

A. Cleaner: Noncorrosive, nonstaining type, compatible with joint forming materials as recommended by sealant manufacturer.
B. Joint Backing:
   1. Closed cell non-gassing polyethylene foam rod, over-sized 30 to 50 percent for joint size, compatible with sealant, sized and shaped to provide proper compression upon insertion in accordance with manufacturer's recommendations.
   2. Acceptable Products:
      a. “Sonolastic Soft Backer-Rod” by Sonneborn.
      b. “SofRod” by Namaco.
      c. Or approved equal products.
   3. Or Non-porous semi-rigid joint backing, used with bond breaker tape.
C. Bond Preventive Materials: Pressure sensitive adhesive polyethylene strip recommended by sealant manufacturer to suit application.

D. Primer: Nonstaining type as recommended by sealant manufacturer to suit application.
E. Masking Tape: Nonstaining, nonabsorbent type compatible with sealant and surfaces adjacent to joints.

2.03 MIXING:

A. Mix multi-component products as directed by manufacturer.

PART THREE - EXECUTION

3.01 PREPARATION:

A. Removing Existing Sealants and Mortar:
   1. Cut out and remove existing sealants, backer rods, bond breaker tapes, joint filler, and other loose materials to depth as required by sealant manufacturer or to 1/2-inch (13mm) minimum.
   2. Remove foreign matter from joint substrates which could interfere with adhesion of joint sealant. Remove dust, oil, grease, waterproofing, water repellent, surface dirt, and paints, except for permanent protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer.
   3. Remove debris from jobsite.
B. Cleaning:
   1. Clean (Grind) joints receiving sealant and adjacent surfaces in manner not to damage existing materials. Perform cleaning of joints the same day sealant is to be installed in cleaned joint.
   2. Remove dust and debris by blowing clean with high pressure air.
C. Priming:
   1. Prime joint substrates where indicated or where recommended by sealant manufacturer based upon preconstruction sealant substrate tests or prior experience.
   2. Apply primer to comply with joint sealer manufacturer's recommendations. Apply primer to surfaces the same day sealant is to be installed onto primed surfaces.
   3. Confine primers to area of joint sealer bond. Do not allow spillage or migration onto adjoining surfaces.
D. Masking: Mask areas adjacent to joints to prevent sealant contact with surfaces which would be permanently stained or damaged by sealant or by cleaning methods required to remove excess sealant.

3.02 APPLICATION:

A. Joint Backing:
   1. To achieve required joint depths, restrict depth of joints by use of joint backer rod.
   2. Size backer rod to allow for 30 percent minimum compression of the backer rod when installed.

3. Where joint backing material is not feasible due to insufficient clearance or depth, install bond preventive material in joint.
4. Three-sided adhesion of sealant is not permitted.

B. Sealant:
1. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates.
2. Apply sealant in uniform continuous bead without gaps or air pockets, following manufacturer's instructions for each specific type of sealant.
3. Provide uniform cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

C. Tooling:
1. Tool joints to required configuration in accordance with manufacturer's recommendations.
2. Tooling Non-sag Sealants:
   a. Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration required.
   b. Eliminate air pockets and ensure contact and adhesion of sealant with sides of joint.
   c. Remove excess sealant from surfaces adjacent to joint.
   d. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by manufacturer.

D. Remove masking immediately after tooling without disturbing joint sealant.

3.03 ADJUSTING:

A. If damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

3.04 CLEANING:

A. Remove excess sealant from adjacent surfaces immediately after contact with xylene or toluene.

B. Remove debris and containers from jobsite.

3.05 PROTECTION:

A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion.

3.06 SCHEDULE:

A. Sealant A: Sealant work in sidewalk construction joints and sidewalk to curb joints.

B. Sealant B: Sealant work in curb-to-curb joints, curb details, and routed and sealed joints.

END OF SECTION 07 92 00

SECTION 32 01 17

ASPHALT PAVEMENT REPAIRS

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Full-depth pavement repairs with hot mix, hot laid asphalt.

1.02 REFERENCES:

A. Appropriate state specification for hot mix, hot laid asphalt for the job site area.
B. CL-19 The Asphalt Institute Bulletin, "Full-Depth Asphalt Patching".
C. ASTM D 946 Standard Specification for Penetration Graded Asphalt Cement in Pavement Construction.
D. ASTM D 2397 Standard Specification for Cationic Emulsified Asphalt.
E. ASTM D 3381 Standard Specification for Viscosity-Graded Asphalt Cement for use in Pavement Construction.
F. ASTM D 3628 Standard Practice for Selection and Use of Emulsified Asphalt.

1.03 PROJECT/SITE CONDITIONS:

A. Environmental Requirements: Apply hot mix, hot laid asphalt in dry weather when pavement and atmospheric temperatures are 40 degrees Fahrenheit or above and are anticipated to remain above 40 degrees Fahrenheit for four hours after completing application.

PART TWO - PRODUCTS

2.01 MATERIALS:

A. Asphalt Cement: ASTM D 3381.
B. Mineral Aggregate: Crushed stone, sand, and mineral aggregate.
C. Tack Coat: ASTM D 946. Uniform Emulsion, Grade SS-1H.

2.02 MIXES:

A. Use dry material to avoid foaming. Mix uniformly in central plant.
B. Mixture: 5 to 7 percent asphalt cement by weight in total mixture.

PART THREE - EXECUTION

3.01 EXAMINATION:

A. Inspect areas and notify COR/RE if additional repairs are needed.
B. If after excavating for repairs, the subbase is found to be unsuitable, notify COR/RE.

3.02 PREPARATION:

A. Remove surface, base course and subgrade to reach firm support. Extend at least one foot horizontally into pavement.
B. Make square or rectangular cuts. Make faces straight and vertical, with one pair of faces, where practical, parallel to the direction of traffic.
C. Trim and compact subgrade. Compact subgrade to at least one hundred percent of standard procter density or ninety-five percent of modified procter density.
D. Tack coat vertical surfaces with ASTM D 2397 or D 3628 asphalt emulsion types SS-1, SS-1h, CSS-1 or CSS-1h diluted with equal parts of water.

3.03 REPAIR/RESTORATION:

A. Backfill with hot mix, hot laid asphalt while temperature stays above 185 degrees Fahrenheit. Prevent segregation of mixture.
B. Compact in layers, if hole is more that 4-inches deep. Compact layers thoroughly to maximum of 2-inches in thickness. Compact with equipment most suited for size of job.
C. Adequate compaction equipment will yield surface of patch at same elevation as the surrounding pavement. When hand tamping or other light compaction methods are required, leave surface of compacted patch slightly higher than adjacent pavement, permitting patch to be further compressed by traffic.
D. Check riding quality and alignment of patch with a straight edge or string line.

3.04 CLEANING:

A. Broom clean areas of work and remove extra materials from job site.

END OF SECTION 32 01 17

SECTION 32 01 17.61

CRACK SEALING ASPHALT PAVEMENTS

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Elastomeric hot applied crack and joint sealing in asphalt pavements.

1.02 RELATED SECTIONS:

A. 32 01 17 - Asphalt Pavement Repairs.
B. 32 12 16 – Seal Coats on Asphalt Pavement.

1.03 REFERENCES:

A. American Society for Testing and Materials (ASTM):
   1. D 1190 Specification for Concrete Joint Sealant, Hot Applied Elastic Type
   2. D 3405 Specification for Joint Sealants, Hot Applied, for Concrete and Asphalt
   3. D 5329 Test Methods for Sealants and Fillers, Hot Applied, for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements

1.04 SYSTEM DESCRIPTION:

A. Provide installation of sealant.

1.05. SUBMITTALS:

A. Product Data: Submit manufacturer's printed Product Data Sheet.

1.06 QUALITY ASSURANCE:

A. Certification: Contractor to submit a letter stating that equipment used to heat the material meets requirements of this specification.
B. Test Reports: Upon request the contractor will submit manufacturer's test results on products used.

1.07 PROJECT/SITE CONDITIONS:

A. Environmental Requirements:
   1. Apply sealant only to clean, dry, properly prepared cracks and joints.
   2. At ambient temperatures below 40 degrees F. use a hot compressed air lance to achieve clean, dry, warm space for sealant installation.

1.08 EXISTING CONDITIONS:

A. Cracks and joints under one quarter inch width are not covered under this specification unless stipulated in writing by Architect/Engineer.
B. If cracks and joints under one quarter inch or less are to be addressed, then they must be routed.

PART TWO - PRODUCTS

2.01 MANUFACTURER:

A. Brand Name: Parking Lot Sealant: Materials are listed as a standard of quality.
B. Or approved equal.

2.02 MATERIALS:

A. A hot applied elastomeric crack/joint sealant for asphalt pavements.

2.03 EQUIPMENT:

A. Melt down the sealant in a kettle or melter constructed as a double boiler. The space between the inner and outer shells filled with high flash point heat transfer oil or other indirect heating means.
B. The kettle to be used must have constant agitation any time material is over 300 degrees Fahrenheit. The kettle must have temperature-monitoring capabilities.
C. Roofing kettles or other direct fired melters are not acceptable for these materials.

PART THREE - EXECUTION

3.01 EXAMINATION:

A. Inspect existing pavement for conditions and defects that will adversely affect quality of work and which cannot be put into acceptable condition through normal preparatory work as specified.
B. Starting installation constitutes Contractor's acceptance of surface as suitable for installation.

3.02 PREPARATION:

A. Cracks:
   1. Remove vegetation and all incompressible materials from cracks and joints by means of hot compressed air lance. Other methods such as routing w/compressed air cleaning may be substituted at engineer's specification. Under ANY circumstances, compressed air used for cleaning MUST be oil free.
   2. Route cracks and joints less than 1/4-inch in width to a minimum 1/2-inch by 1/2-inch in shape.
   3. Prepare cracks using specialized backing material after cleaning to maintain 1 to 1 depth to width profile as specified.
B. Sealant:
   1. Prepare sealant in specified equipment.
   2. Heat sealant according to manufacturer's Product Data Sheet.

3.03 APPLICATION:

A. Install heated sealant directly into cracks and joints not to exceed a 1-inch wide band.
B. Control thickness to 1/8-inch above pavement surface.
C. Finished sealed cracks and joints will be uniformly level and all "sinkers" will be refilled to achieve flush to 1/8-inch concave surface appearance.

D. Tool sealant to achieve resulting cap bead covering subject crack.

3.04 PROTECTION:

A. Care must be taken to keep the public from work area while sealant is being installed and traffic should not be allowed to cross sealant filled cracks and joints for a period of ten minutes or until sealant has cooled sufficiently to prevent tracking.

B. Failure to follow manufacturer's printed recommendations could result in a severe burn hazard.

END OF SECTION 32 01 17.61

SECTION 32 11 27

REWORKING FLEXIBLE BASE MATERIAL

PART ONE - GENERAL

1.01 DESCRIPTION

A. Reworking existing flexible base material with an asphaltic pavement surface.
B. Scarify, reshape, compact, and finish existing flexible base material where full depth asphalt pavement repairs are performed. Include all labor, material, tools, equipment, and incidentals necessary to complete the work, including warranty work.

1.02 RELATED SECTIONS

A. 32 01 17 – Asphalt Pavement Repairs
B. 32 01 17.16 – Crack Sealing Asphalt Pavements
C. 32 12 36 – Seal Coats on Asphalt Pavement

1.03 PROJECT CONDITIONS

A. Perform work in dry weather.

PART TWO – PRODUCTS

2.01 TESTING REQUIREMENTS

A. The scarified and compacted base course shall be proof rolled as directed by the COR/RE. if, in the opinion of the COR/RE, the compacted base course material is non-uniform, additional testing shall be required.
B. A compaction curve (ASTM D 1557) shall be developed on the mixed flexible base course material.
C. In-place field density shall be determined by Nuclear Methods (ASTM D 2922) or by Sand Cone Methods (ASTM D 1556) at locations selected by the COR/RE. The frequency of tests shall be a minimum of three (3) tests, each taken at a different location.

2.02 REPLACEMENT BASE COURSE MATERIAL

A. Crushed limestone. The material shall meet the material requirements of TX DOT 247, Type A, Grade 1-2.

PART THREE – EXECUTION

3.01 GENERAL

A. The work shall be performed to the area shown on the Drawings.
B. Reworking base material shall consist of either scarifying and reshaping or scarifying, salvaging and replacing existing base material as defined below;
   1. Scarifying consists of loosening and breaking the existing base material.
   2. Reshaping consists of reworking the scarified in-place base material with or without additional new base material.

3. Salvaging consists of removing, saving and temporarily stockpiling, if necessary, the existing scarified base material.
4. Replacing consists of returning and reworking the salvaged base material, with or without additional new base material, on the prepared roadbed.

3.02 SCARIFYING AND RESHAPING

A. The existing flexible base, after removal of the existing asphaltic concrete pavement, shall be cleaned of all objectionable materials by blading, brooming or other approved methods, prior to scarifying. After cleaning, the existing material shall be scarified for its full width and to a depth where sound base course material is found, unless otherwise shown on the plans. The underlying sub-grade shall not be disturbed. The material shall be broken into pieces not more than 2 ½ inches (63mm) in size.
B. After completion of scarifying, the existing base shall be mixed and shaped to conform to the lines, grades, and typical sections shown on the Plans.
C. New base material shall be placed on the existing scarified material and uniformly mixed when the mixed material does not achieve the required grade.

3.03 SCARIFYING, SALVAGING AND REPLACING

A. The existing base, after removal of the existing asphaltic concrete pavement, shall be cleaned of all objectionable materials by blading, brooming or other approved methods, prior to scarifying. After cleaning, the existing material shall be scarified for its full width and to a depth where sound base course material is found, unless otherwise shown on the plans. The underlying sub-grade shall not be disturbed. The material shall be broken into pieces not more than 2 ½- inches (63mm) in size.
B. The scarified material shall be removed from the roadbed. The scarified material may be salvaged by placing in temporary stockpiles or windrows until preparation of the sub-grade is complete.
C. All salvaging operations shall not interfere with traffic, proper drainage or the general requirements of the work. All material to be salvaged shall be kept reasonably free of soil from the sub-grade or roadbed.
D. Prior to replacing the salvaged material, the sub-grade shall be constructed and shaped to conform to the desired profile.
E. The salvaged material shall be deposited on the prepared sub-grade, wetted if needed, bladed, and shaped to conform to the lines, grades, and typical sections shown on the Plans or as directed by the Owner. New base material shall be placed and uniformly mixed with the salvaged material.
F. All areas of segregated material shall be corrected or removed and replaced with well graded material. All salvaged material shall be kept reasonably free of objectionable materials during the replacing operations.

3.04 COMPACTION

A. The reshaped or replaced material shall be wetted as required and compacted to a uniform density of not less than 95 percent of the modified density (ASTM D 1557). The allowable deviation from optimum moisture content is +/- 2 percent.

B. The Contractor shall rework the base material at his expense if the material fails to meet the required density or, for any reason, loses stability and finish before the next course is placed. The method of reworking shall be by loosening, adding or removing material, and reshaping and recompacting by wetting and rolling. All irregularities, depressions or weak spots which develop shall be corrected immediately by scarifying the affected areas, adding suitable material as required, reshaping, and recompacting.
C. The shape of the course shall be maintained by blading throughout the entire compacting operation. The completed surface shall be smooth and in conformance with the lines, grades, and typical sections shown on Plans. The Contractor shall check the elevation at the center and edges of the repaired base course at each repair location. Any deviation more than ¼-inch (6mm) from the established section and grade shall be corrected by loosening, adding or removing material, reshaping and compacting.
D. The base shall be cured to the approval of the COR/RE prior to placing the final surface on the completed base course.

END OF SECTION 11 32 27

SECTION 32 12 36

SEAL COATS ON ASPHALT PAVEMENT

PART ONE - GENERAL

1.01 SUMMARY:

A. Section includes bituminous seal coats over existing asphalt pavement and pavement repairs.

1.02 DESCRIPTION:

A. Provide bituminous seal coat with sand aggregate in specified areas.

1.03 REFERENCES:

A. ASTM: American Society for Testing and Materials
   1. ASTM D5: Standard Test Method for Penetration of Bituminous Materials
   2. ASTM D244: Standard Test Methods and Practices for Emulsified Asphalts
   3. ASTM D451: Standard Test Method for Sieve Analysis of Granular Mineral Surfacing For Asphalt Roofing Products
   4. ASTM D2007: Standard Test Method for Characteristic Groups in Rubber Extender and Processing Oils and Other Petroleum-Derived Oils by the Clay-Gel Absorption Chromatographic Method
   5. ASTM D2042: Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene
   6. ASTM D4402: Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer

1.04 SUBMITTALS

A. Provide submittals in accordance with Section 01 33 00 – Submittals.
B. Product data, specifications, and SDS for bituminous materials.
C. Product data, specifications, and SDS for acrylic copolymer.
D. Gradation analysis of aggregate to be furnished.
E. Certifications that each load of bituminous materials delivered is the type, grade, and quality specified. Certification shall show the shipment number, source of material, and date of shipment.

1.05 STORAGE AND HANDLING

A. Store and handle products in accordance with manufacturers' recommendations.

PART TWO - PRODUCTS

2.01 BITUMINOUS EMULSION CONCENTRATE

A. The emulsion concentrate, in the undiluted state, shall have the following properties:
   1. Saybolt viscosity at 77ºF (ASTM D244): 20-100 seconds
   2. Residual by distribution or evaporation: 57% min.
   3. Sieve test (ASTM D244): 0.2% max.
   4. 5 day settlement test (ASTM D244): 5.0% max.
   5. pH, cationic: 2 to 6.5

B. The emulsion concentrate, when diluted in the proportion of 1 part of concentrate to 1 part of water, by volume and ready to apply, shall have the following properties:
   1. Saybolt viscosity at 77ºF (ASTM D244): 10-50 seconds
   2. Residual by distribution or evaporation: 28 to 42% min.
   3. Sieve test (ASTM D244): 0.1% max.
   4. Pumping stability test (a): Pass
      a. Pumping stability is tested by pumping 1 pint of seal coat material, diluted 1 part concentrate to 1 part water, at 77ºF, through a 1/4 inch gear pump operating 1750 rpm for 10 minutes with no significant separation or coagulation.

C. Tests on residue from distillation or evaporation:
   1. Viscosity at 275ºF, (ASTM D4402): 1750 cps max.
   2. Solubility in 1,1,1 trichloroethylene (ASTM D2042): 97.5% min.
   3. Penetration (ASTM D5): 50 dmm max.
   4. Asphaltenes (ASTM D2007): 15% min.
   5. Saturates (ASTM D2007): 15% max.
   6. Polar Compounds (ASTM D2007): 25% min.
   7. Aromatics (ASTM D2007): 15% min.

D. The bituminous emulsion concentrate material shall contain not less than 20 percent Gilsonite. It shall be compatible with asphalt concrete and have a 5-year, minimum, proven performance record. Drying time, under recommended application conditions, shall not exceed 4 hours.

2.02 POLYMER

A. The vinyl acrylic copolymer shall be approved for use by the manufacturer of the bituminous material for compatibility and shall have the following properties:

1. Solids content, percent by weight	55 percent
2. Weight per gallon, lbs	
Emulsion	9.0 lbs
Resin Solids	9.8 lbs
3. pH	5.0
4. Viscosity, cps (as tested by the Brookfield RVT #3 spindle at 20 rpm and 25ºC)	2,250
5. Particle charge	Nonionic
6. Free monomer, percent by weight	0.5 percent max.
7. Mechanical stability	Excellent
8. Minimum film forming temperature, ºC	+5
9. Tg ºC	+1

2.03 SAND

A. The sand material shall consist of hard durable particles or fragments of granular aggregates or dry, clean, dust free slag with a Mohs hardness value of 7.5 – 8.0. Sanding material shall be black boiler sanding slag or similar angular, black abrasive.

B. The material shall meet the following gradation analysis in accordance with ASTM D451:

Sieve Size	Percentage by Weight
No. 16	0-0.1
No. 20	0-1
No. 30	5-20
No. 40	40-65
No. 50	20-40
No. 60	0-5
No. 100	0-3
Pan	0-0.2

2.04 PRECAUTIONS:

A. Seal coat should not be applied unless pavement temperature is at least 50 degrees Fahrenheit (10 degrees Celsius), and the air temperature is 50 degrees Fahrenheit and rising.

B. Seal coat should not be applied to wet surfaces, and during rainy or wet weather, or when rain is anticipated within eight hours after application is completed.

C. Seal coat should not be applied to hot surfaces under the summer sun (Over 90 degrees Fahrenheit [32 degrees Celsius], ambient) without first cooling the surface with clean water. Water should dampen the surface without leaving puddles.

D. Since an emulsion may be damaged by freezing, it should be protected at all times when the temperature drops below 40 degrees Fahrenheit (4 degrees Celsius).

2.05 EQUIPMENT:

A. Use application equipment that is capable of applying the required coating rates evenly over the entire width of the application mechanism to provide a uniformly coated surface. To insure this, equip all spray units with a pumping distribution system using positive displacement pumps.

B. Equipment shall have a 12-foot (3.65m) minimum spreader bar with individual nozzle control. Spreader bar tips shall be clean, free of burrs, and of a consistent size to maintain an even distribution of seal coat material.

C. Equipment shall be able to heat and mix material to the required temperature in preparation for application. The mixing part of the application equipment must be tank type with a mechanically powered, full sweep mixer capable of homogeneously mixing the entire contents of the tank. Heating and mixing shall be in accordance with the manufacturer's recommendations.

D. Equip all squeegee/brush units with squeegees/brushes that are properly adjusted and in a condition so that the application of seal coat materials is without streaks.

E. Use of hand squeegee or brush application is to be restricted to places not accessible to the mechanized equipment or to accommodate neat trim work at curbs, etc. Material that is applied by hand is to meet the same standards as that applied by machine.

PART THREE - EXECUTION

3.01 SURFACE PREPARATION:

A. Preparation Of Aged Asphalt Pavement Surfaces:

1. Repair: Repair asphalt bituminous pavement surfaces which have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt pavement similar to that of the existing pavement.
2. Crack Sealing: Remove all vegetation and debris from cracks to a minimum depth of 1/2-inch (13mm). If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the RE. Fill all cracks, ignoring hairline cracks less than 1/2-inch (13mm) wide with a crack sealant. Wider cracks greater than 1-1/2-inches (38mm) wide, along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced.
3. Cleaning Existing Surface: Clean pavement surface immediately prior to placing the prime coat or seal coat by sweeping, flushing well with water, leaving no standing water, or a combination of both, so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.
4. Oil Spot Priming: Remove oil or grease that has not penetrated the asphalt pavement by scraping or by scrubbing with a detergent, then wash thoroughly with clean water. After cleaning, treat these areas with the oil spot primer.
5. Pavement Priming: Older, highly oxidized pavements sometimes have trouble allowing pavement seal coats to adhere. To insure adhesion to sound but oxidized pavements, mix and apply a prime coat of a type and at a rate

recommended by the emulsion manufacturer, after all loose aggregate is removed.

B. Preparation Of New Asphalt Pavement Surfaces:
   1. Cure new asphalt pavement surfaces so that there is no concentration of oils on the surface.
   2. A period of at least 90 days at +70 degrees Fahrenheit (21 degrees Celsius) daytime temperatures must elapse between the placement of a hot mixed asphaltic concrete surface course and the application of the seal coat.
   3. Perform a water-break-free test to confirm that the surface oils have degraded and dissipated. Cast one gallon of clean water out over the surface. The water should sheet out and wet the surface uniformly without crawling or showing oil rings.
   4. If asphalt does not pass this test, additional time must be allowed for extra curing and retesting prior to sealing.

C. Place barricades around the work area prior to starting work each day.

D. Cover any fixtures or pavement markers present. If seal coat gets on the fixtures or pavement markers, clean immediately.

3.02 MIXING AND APPLICATION:

A. Mixing:
   1. Blend bituminous concentrate material, water, and polymer.
   2. Mix one part bituminous emulsion concentrate to one part water, by volume.
   3. Add 1 percent polymer, by volume, to the mix. If polymer is added to the mix prior to delivery, submit certification and weigh scale tickets to COR/ RE.
   4. The polymer may be added to the mix at the job site, provided the polymer is added while the circulating pump is running, the mix is agitated for a minimum of 15 minutes, and the polymer is mixed to the satisfaction of the COR/ RE.

B. Application of Bituminous Material:
   1. Following the preparation and inspection of the pavement surface, uniformly apply the bituminous seal coat material in a single pass at the specified rates with either a double or triple lap spray over the surface to be sealed. Apply at the rate of 0.20 gallons per square yard (0.91l/m^2), or as recommended by the seal coat provider, and as much as the pavement will contain without runoff. If runoff does occur, prevent seal coat from running onto the curbs, adjacent pavement, or the drainage trough.
   2. Spread building paper on the surface for a sufficient distance back from the ends of each application so that flow through the spray bar may be started and stopped on the paper and so that all sprays will be operating at the proper pressure on the surface to be sealed. Immediately after the application, remove the building paper.
   3. Properly treat with bituminous material spots missed by the distributor.

C. Application of Aggregate:
   1. immediately after application of the fog seal, spread the specified quantity of cover aggregate uniformly over the bituminous material. Apply sand at the rate of 0.25 pounds per square yard (0.14 kg/m^2), as approved by COR/ RE.
   2. No bituminous material shall be down more than three minutes before it is covered with aggregate. Spread aggregate uniformly with aggregate-spreading equipment. Equipment should have the ability to apply sand in the forward and backward direction.
   3. Operate trucks spreading aggregate backwards, covering the bituminous material ahead of the truck wheels.
   4. Areas having insufficient cover shall be lightly recovered with additional aggregate by hand during the operations whenever necessary.
   5. Prevent sand from being distributed on pavements that have not received the seal coat material.

CI. All surplus aggregate shall be swept off the surface and removed not less than 24 hours nor more than 4 days after work is completed. Dispose of removed sand off site in a legal manner.

3.03 SITE PROTECTION:

A. During application, protect adjacent buildings, structures, vehicles, manhole covers, inlet grates, and trees to prevent being spattered or marred.

3.04 TRAFFIC CONTROL:

A. Protect freshly placed coatings from damage by traffic. Provide sufficient warning signs and barricades to prevent traffic over freshly treated surfaces. Protect treated areas from traffic for at least twenty-four hours after final application of coatings, or for such time as necessary to prevent picking up. Immediately prior to opening to traffic, roll the entire treated area with a self-propelled pneumatic-tired roller. Provide warning signs and barricades for proper traffic control.

END OF SECTION 32 12 36

SECTION 32 17 23

PAVEMENT MARKINGS

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Furnish all labor, materials, tools, equipment, appliances, and perform all work involved in preparing the pavement surfaces and applying pavement marking paint as shown on the Drawings.
B. Perform surface preparation of the seal coat on the asphalt pavement to receive pavement markings.
C. Apply the non-reflectorized solvent borne chlorinated rubber pavement marking paint at locations shown on the Drawings.

1.02 REFERENCES:

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
B. ASTM D6628 (2015): Standard Specification for Color of Pavement Marking Materials

1.03 SUBMITTALS:

A. Provide submittals in accordance with 01 33 00 Submittals.
B. Product Data: Submit manufacturer’s technical data for all products furnished, including application instructions, Material Safety Data Sheets (SDS), and safety requirements.
C. Submit list of five projects similar in nature which have been installed by applicator within last five years, identified with project name, location, and date.
D. Submit sample of manufacturer’s standard warranty
E. Equipment: Submit list of equipment to be used for surface preparation, cleaning, and pavement marking application.
F. Submit preliminary progress schedule indicating approximate start and completion dates and planned sequence for pavement marking installation. Address areas which will be closed or restricted from normal use, and the approximate times the areas will be restricted.
G. Samples: Submit samples of each color of pavement marking material to be installed, applied to 1/4-inch (6mm) thick plywood, or similar rigid base, 6-inch (150mm) square, indicating color and surface texture of the pavement marking material.
H. Field sample: Install field sample at project site representative of each type of traffic marking material to be installed. Sample shall include typical surface preparation, and pavement markings of the specified size. Provide sample of block lettering for fire lane detail stripe.
I. Contractor's warranty and manufacturer's guarantee documents.

1.04 QUALITY ASSURANCE:

A. Regulatory Requirements: Submit certificate stating that the proposed pavement marking paint meets the Volatile Organic Compound, (VOC) regulations of the local Air Pollution Control District having jurisdiction over the geographical area in which the project is located.

B. Qualifications: Submit documentation certifying that pertinent personnel are qualified for equipment operation and handling of applicable chemicals. The documentation should include experience on five projects of similar size and scope with references for all personnel.

1.05 DELIVERY AND STORAGE:

A. Deliver pavement marking materials in original sealed containers, bearing labels that include the product name, specification number, batch number, color, date of manufacture, shelf life, manufacturer's application directions, and name of manufacturer.

B. Store materials within a temperature range of 40 and 90 degrees Fahrenheit (4 degrees to 32 degrees Celsius).

C. Store materials in a single lockable area of project site, in location approved by RE.

D. Protect materials from extreme temperatures and exposure. Store in accordance with manufacturer's recommendations.

E. Remove damaged, deteriorated, or out-of-date material from site.

1.06 PROJECT/SITE CONDITIONS:

A. Install materials in accordance with all safety and weather conditions required by manufacturer, or as modified by applicable rules and regulations of local, state, and federal authorities having jurisdiction.

B. Remove open fires and spark producing equipment from application area until vapors have dissipated.

C. Apply pavement markings to clean, dry surfaces, and unless otherwise approved, only when the air and pavement surface temperature is at least 38 degrees Fahrenheit (3 degrees Celsius) above the dew point and the air and pavement temperatures are within the limits recommended by the pavement marking manufacturer.

D. Allow pavement surfaces to dry after water has been used for cleaning or rainfall has occurred prior to striping or marking. Test the pavement surface for moisture before beginning work each day and after cleaning. Do not commence marking until the pavement is sufficiently dry and the pavement condition has been approved by the COR/RE. Employ the "Rubber mat test" procedure to test the pavement for moisture.

E. Place warning signs conforming to the Manual On Uniform Traffic Control Devices near the beginning of the worksite and well ahead of the worksite for alerting approaching traffic from both directions. Place small markers along newly painted lines to control traffic and prevent damage to newly painted surfaces. Mark painting equipment with large warning signs indicating slow-moving painting equipment in operation.

F. When traffic must be rerouted or controlled to accomplish the work, provide necessary warning signs, flag persons, and related equipment for the safe passage of vehicles.

1.07 WARRANTY AND GUARANTEE:

A. Manufacturer's Guarantee: Provide longest available material guarantee.
B. Contractor's Warranty: Provide warranty against deterioration and workmanship defects for a period of two years from date of final acceptance by Owner.

PART TWO PRODUCTS

2.01 TRAFFIC MARKING PAINT:

A. Chlorinated rubber traffic marking paint, typified by:
   1. Aexcel “High Performance Chlorinated Rubber Zone Marking Paint.”
   2. Transline “Chlorinated Rubber Zone Marking Paint.”
   3. Sherwin Williams “SETFAST Chlorinated Rubber Alkyd Zone Marking Paint.”
   4 Or approved equivalent.

2.02 EQUIPMENT

A. Pressure Washing Equipment: Use mobile pressure washing equipment capable of producing a pressurized stream of water that effectively removes paint from the pavement surface without significantly damaging the pavement. Provide equipment, tools, and machinery which are safe and in good working order at all times.
B. Grinding or Scarifying Equipment: Use equipment capable of removing surface contaminates, paint build-up, or extraneous markings from the pavement surface without leaving any residue. Clean the surface by hydro blast to remove surface contaminates and ash after a weed torch is used to remove paint.
C. Paint Application Equipment: Use appropriate for the material(s) to be used. Provide manufacturer's descriptive data and certification for the planned use that indicates area of coverage per pass, pressure adjustment range, tank and flow capacities, and all safety precautions required for operating and maintaining the equipment. Provide and maintain machines, tools, and equipment used in the performance of the work in satisfactory operating condition, or remove them from the work site. Provide mobile and maneuverable application equipment to the extent that straight lines can be followed and normal curves can be made in a true arc.

PART THREE - EXECUTION

3.01 EXAMINATION

A. Testing for Moisture:
   1. Test the pavement surface for moisture before beginning pavement marking after each period of rainfall, fog, high humidity, or cleaning, or when the ambient temperature has fallen below the dew point. Do not commence marking until the pavement is sufficiently dry and the pavement condition has been approved by Owner.
   2. Employ the "Rubber mat test" to test the pavement for moisture as follows: Cover the pavement with a 24-inch by 24-inch (600mm by 600mm) section of rubber mat or clear plastic wrap and seal the edges with tape. After 1 hour, examine the rubber mat or plastic wrap for any visible moisture accumulation below the mat or plastic sheet. Do not begin marking operations until the test can be performed with no visible moisture accumulation below the mat or plastic sheet. Re-test surfaces when work has been stopped due to rain.

B. Surface Preparation Demonstration: Prior to surface preparation, demonstrate the proposed procedures and equipment. Prepare areas large enough to determine cleanliness and rate of cleaning. Approved demonstration area establishes the standard for the remainder of the work.
C. Test Stripe Demonstration: Prior to paint application, demonstrate test stripe application within the work area using the proposed materials and equipment. Apply separate test stripes in each of the colors, line widths, and configurations required using the proposed equipment. Make the test stripes long enough to determine the proper speed and operating pressures for the vehicle(s) and machinery.
D. Application Rate Demonstration: During the Test Stripe Demonstration, demonstrate compliance with the application rates specified. Document the equipment speed and operating pressures required to meet the specified rates in each configuration of the equipment, and provide a copy of the documentation to the COR/RE prior to proceeding with the work.
E. Level of Performance Demonstration: The COR/RE will be present at the application demonstrations to observe the results obtained and to validate the operating parameters of the vehicle(s) and equipment. If accepted by the Owner, the sample test stripe is the measure of performance required for this project. Do not proceed with the work until the demonstration results are satisfactory to the COR/RE.

3.02 SURFACE PREPARATION

A. Allow new seal coat surface to cure for a period of not less than 30 days before application of marking materials. Thoroughly clean surfaces to receive marking paint before application of the paint. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods as required. Remove dust, debris, oil spots, and other contaminants on the pavement surface by pressure washing.

3.03 PAINT APPLICATION

A. Early Painting of Asphalt Pavements: For asphalt pavement systems requiring painting application at less than 30 days, apply the marking paint at half the normal application rate, followed by a second application at the normal rate after 30 days.
B. Apply pavement markings to dry pavements only.
C. Apply paint with approved equipment at rate of coverage specified by the paint manufacturer, or at 15-mils (0.38mm) wet film thickness minimum. Provide guidelines and templates as necessary to control paint application. Take special precautions in marking letters and symbols. Manually paint letters, and symbols. Sharply outline all edges of markings. The maximum drying time requirements of the paint specifications will be strictly enforced, to prevent undue softening of bitumen, and pickup, displacement, or discoloration by tires of traffic. If there is a deficiency in drying of the markings, painting operations must cease until the cause of the slow drying is determined and corrected.
E. Do not install paint on wet surfaces when relative humidity is greater than 85 percent or when ambient and surface temperatures are below 50 degrees Fahrenheit (10 degrees Celsius).

F. Roughen surface of vehicular traffic coating if required by traffic marking paint manufacturer.
G. Install traffic marking paint in accordance with paint manufacturer's recommendations to match the existing traffic markings and ADA symbols.
H. Install new traffic marking paint to cover full extent of existing traffic markings and ADA symbols where the new vehicular traffic coating partially covers the existing traffic markings and ADA symbols.
I. Allow traffic marking paint to cure for twenty-four hours minimum before permitting traffic on surfaces.

3.04 CLEANUP AND WASTE DISPOSAL

A. Keep the worksite clean and free of debris and waste from the removal and application operations. Immediately cleanup following removal operations. Dispose of debris at approved sites.

3.05 FIELD QUALITY CONTROL

A. Material Inspection: Examine material at the job site to determine that it is the material referenced in the Submittals Provide test results substantiating conformance to the specified requirements.
B. Dimensional Tolerances: Apply all markings in the standard dimensions provide in the Drawings. New markings may deviate a maximum of 10 percent larger than the standard dimension.
C. Bond Failure Verification: Inspect newly applied markings for signs of bond failure based on visual inspection.

END OF SECTION 32 17 23

SECTION 32 17 23.23

REFLECTORIZED PAVEMENT MARKERS

PART ONE - GENERAL

1.01 DESCRIPTION

A. Furnish and install blue-colored raised reflectorized pavement marker (RPM) to delineate a fire hydrant at location designated on the plans or as directed by the COR/RE.
B. Include all materials, surface preparation, installation, labor, equipment, tools, and incidentals necessary to complete the work.

1.02 RELATED SECTIONS

A. 02 40 00 - Minor Demolition and Renovation Work.
B. 32 12 36 -Seal Coats on Asphalt Pavement.

1.03 SUBMITTALS:

A. Provide Submittals in accordance with Section 01 33 00 – Submittals.
B. Product Data: Submit manufacturer's product data, substrate preparation, and installation instructions for markers.
C. Product data: Submit epoxy adhesive project data, SDS, and application instructions.
D. Submit manufacturer's test results, technical specifications, and certification that products meet specified requirements and are appropriate for project applications.

PART TWO – PRODUCTS

2.01 MATERIALS

A. The RPM shall conform to Item No. 672, Texas Department of Transportation's Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges, June 2004, Type II-B-B.
   1. The outer surface of the marker shall be smooth and all corners and edges exposed to traffic shall be rounded.
   2. The width of the base of the marker shall be a minimum of 4-inches (100 mm).
   3. The maximum height shall be ¾-inch (19mm).
   4. The maximum slope of the reflector faces shall be not more than 30 degrees from the horizontal.
B. All markers used on this project shall be of the same material and same manufacture.
C. The base of the marker shall be flat (The deviation from a flat surface shall not exceed 1/16 inch), and designed to be bonded to either asphaltic or Portland cement concrete pavement, with an approved epoxy adhesive meeting the requirements stated in TxDOT Test Method TEX-611-J.

2.03 STRENGTH REQUIREMENTS:

A. The markers shall comply with the adhesion requirements of TxDOT Test Method TEX-611-J. The marker shall withstand a falling-ball impact of 5-feet (1.5m) without breaking, cracking or being significantly deformed when tested according to TxDOT Test Method TEX-430-A. The marker shall show no change in shape or color when subjected to the requirements of TxDOT Test Method TEX-846-B. The temperature shall be 140 degrees Fahrenheit (60 degrees Celsius) with the marker in a vertical position.

2.04 MARKER TYPES:

A. The color and number of reflective surfaces of the marker shall be Blue, with two reflective faces, Type II-B-B.

PART 3 – EXECUTION

3.01 GENERAL

A. The RPMs shall be placed in accordance with the plans or as directed by the COR/RE.
B. The pavement surface shall be prepared by buffing, grinding, or other methods approved by the COR/RE.
C. After preparation, the surface must be free of dirt, grease, oil, moisture, loose unsound pavement, and any other material, which would adversely affect the bond of the adhesive.
D. The wet epoxy or bituminous material shall be applied so that 100 percent of the bonding area of the marker will be in contact and shall be of sufficient thickness so that the excess adhesive shall be forced out around the perimeter of the marker.
E. When the project is complete, the marker shall be firmly bonded to the pavement.
F. The installation shall present a neat appearance.

END OF SECTION 32 17 23.23

SECTION 34 41 13

SIGNAGE

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A. Provide all materials, hardware, equipment, transportation, protection and labor required to furnish and install information signage, as shown on the plans, or as directed by the COR/RE.
B. Secure signage to existing brackets and clamps. Where no existing brackets and clamps are present, fasten signage directly to existing steel posts.
C. Furnish and install new steel caps on steel posts where caps are missing.

1.02 RELATED SECTIONS:

A. 02 40 00 – Minor Demolition and Renovation
B. 32 12 36 – Seal Coats on Asphalt Pavement

1.03 SUBMITTALS:

A. Provide Submittals in accordance with Section 01 33 00 – Submittals.
B. Product Data: Submit manufacturer's product data for the sign substrate.
C. Samples: Submit two samples of sign substrate material, 6-inch square.
D. Shop Drawings: Show shop drawings, not necessarily to scale, but sufficient enough in detail to show color, wording, lettering size and style, overall sign size, construction details and installation details for each type of sign.

PART TWO - PRODUCTS

2.01 SIGN SUBSTRATE:

A. Sign substrate shall meet requirements of ASTM B 209 and have the following thickness: 0.080-inch for signs less than 7.5 square feet in area.

2.02 SIGN SHEETING:

A. All sign sheeting materials shall meet the requirements of ASTM D 4956, as follows:
   1. White background – ASTM D 4956, Type III or IV (TxDOT Type C), with black acrylic legend/border.

2.03. MISCELLANEOUS

A. Use galvanized steel, stainless steel, or dichromate-sealed aluminum for bolts, nuts, washers, lock washers, screws, and other sign assembly hardware. Use plastic or nylon washers to avoid tearing the sheeting material.

PART THREE - EXECUTION

3.01 INSTALLATION

A. Remove and dispose of existing signs.
B. Erect signs in their designated locations, as indicated and in accordance with the approved Shop Drawings.
C. Protect surfaces and finishes from abrasion and other damage during handling and installation.

END OF SECTION 34 41 13