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for
TECHNICAL SPECIFICATIONS
TRANSFER STATION REPAIRS PROJECT
Carroll County Transfer Station
Westminster, Carroll County, Maryland

TECHNICAL SPECIFICATIONS

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SECTION 01100

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY OF WORK

- A. The general categories of Work that are to be performed under this Contract include, but are not limited to, the following:
1. demolishing existing concrete slab across entire tipping floor;
 2. excavating and disposing of existing unsuitable aggregate and soil subbase at bays 1 and 2;
 3. replacing compacted soil subbase and aggregate subbase at bays 1 and 2;
 4. constructing 12-in. thick concrete tipping floor slab across entire tipping floor;
 5. constructing bollards;
 6. [OPTIONAL] constructing tacked-on stormwater diversion curb;
 7. [OPTIONAL] demolishing existing asphalt in front of bays 1-4;
 8. [OPTIONAL] excavating and disposing of existing unsuitable aggregate and soil subbase in concrete apron area;
 9. [OPTIONAL] replacing compacted soil subbase and aggregate subbase in concrete apron area;
 10. [OPTIONAL] constructing 12-in. thick concrete apron and returning apron surface to match surrounding surface elevation; and
 11. performing all other Work that is not specifically defined in this Section, but shown on the Drawings and described in these Technical Specifications.
- B. CONTRACTOR is responsible to provide all materials, labor, equipment, supervision, testing, and coordination required for execution of the Work.
- C. CONTRACTOR shall perform Work during the construction period and shall coordinate the construction schedule and operations with OWNER and other contractors performing Work listed under Part 1.01.A of this Section. CONTRACTOR is responsible for scheduling construction activities in a manner such that all activities are completed by the scheduled project completion date.

1.02 OWNER SUPPLIED MATERIALS AND SERVICES

- A. OWNER shall supply fill for use as soil subbase from an on-site stockpile location. CONTRACTOR shall be responsible to load and haul fill from the stockpile location. All other materials necessary to complete the Work shall be provided by CONTRACTOR.
- B. Demolition debris created during completion of the Work may be disposed of at OWNER's on-site landfill at no charge to CONTRACTOR. CONTRACTOR is responsible to load haul, and dump demolition waste materials at the working face of the landfill.

1.03 CONTRACTOR USE OF SITE AND PREMISES

- A. CONTRACTOR's access to OWNER's property is limited to the project work area and includes:
 - 1. the portion of the existing building used for transfer of solid waste;
 - 2. the paved area immediately in front of the waste transfer loading bays;
 - 3. site access roads; and
 - 4. landfill working face when disposing of the project's demolition waste.

1.04 OWNER OCCUPANCY

- A. CONTRACTOR shall cooperate with OWNER to minimize conflict with OWNER's operations at the Site.

1.05 DATES FOR SUBSTANTIAL AND FINAL COMPLETION

- A. The date for Substantial Completion of the Work items identified in Part 1.01.A of this Section shall be **50** calendar days after issuance of Notice to Proceed. The date of Substantial Completion is defined herein as the date when ENGINEER gives its approval of Substantial Completion of the Work as described in Section 01775.
- B. The date for Final Completion of the Work shall be no more than **10** calendar days following issuance of Substantial Completion.

1.06 WORK PLAN SUBMITTAL

- A. In addition to information regarding materials, equipment, and shop drawings, CONTRACTOR is required to provide a number of Work Plan submittals associated with the project. These submittals include, but are not limited to, the following:
 - 1. Construction Schedule;
 - 2. Health and Safety Plan; and

3. Construction Quality Control Subconsultant (Section 01450).
- B. The purpose of the Work Plan submittals is for CONTRACTOR to:
1. demonstrate CONTRACTOR's understanding of the scope of work;
 2. demonstrate CONTRACTOR's understanding of the schedule dependence between various components of the Work;
 3. define CONTRACTOR's activities to ensure the project is completed without safety incidents or worker injuries; and
 4. identify the specific testing and certifications required to document conformance of finished work with the requirements of the Drawings and the Technical Specifications.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 GENERAL

- A. CONTRACTOR shall execute all Work in accordance with the requirements herein.

3.02 FAMILIARIZATION

- A. Prior to implementing any Work, CONTRACTOR shall become thoroughly familiar with the site, the existing site conditions, and all portions of the Work falling within the appropriate section of the Technical Specifications.
- B. Prior to implementing any Work, CONTRACTOR shall carefully inspect the previously installed Work to verify that the previous Work is complete to the point where the installation of succeeding Work may properly commence without adverse impact.
- C. If CONTRACTOR has any concerns regarding the previously installed Work, then CONTRACTOR should immediately notify OWNER and ENGINEER verbally and in writing (within 48 hours of the site visit). Failure to notify OWNER and ENGINEER or continuance with Work will be construed as CONTRACTOR's acceptance of the previous Work.

3.03 PROTECTION OF WORK

- A. CONTRACTOR shall use all means necessary to protect all prior Work, including all materials and completed Work of other sections.
- B. In the event of damage to Work performed by CONTRACTOR prior to OWNER's acceptance of the Work, CONTRACTOR shall immediately make all repairs and replacements necessary, to the approval of ENGINEER, and at no additional cost to OWNER.

[END OF SECTION]

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION

- A. This Section describes the methods for Measurement and Payment for the Work of this Contract.
- B. As noted below, Measurement and Payment of Work will be made, and payment for Work will be taken to be included in, and covered by, the Contract unit prices and lump sum payment methods for the various bid items listed in CONTRACTOR's Bid Schedule.
- C. CONTRACTOR shall provide necessary equipment, workers, Construction Quality Control testing, and survey personnel as required.

1.02 ENGINEER'S ESTIMATE OF QUANTITIES

- A. Bid items and estimated quantities are identified in CONTRACTOR's Bid Schedule of the Contract Documents. The estimated quantities for unit price pay items are approximate only and are included solely for the purpose of comparison of Bids. OWNER does not expressly or by implication agree that the nature of the materials encountered below surface level or the actual quantities of material encountered or required will correspond with the estimated quantities. For unit rate items, CONTRACTOR shall be paid only for the quantity of actual work completed.
- B. If the actual Work requires a quantity different from those quantities indicated on CONTRACTOR's Bid Schedule, then CONTRACTOR shall provide the required quantities at the contract unit prices. If the actual final quantity varies by more than 25% of the quantities indicated on the Bid Schedule, then CONTRACTOR and OWNER shall negotiate a revised unit rate to reflect either the loss or gain in price efficiency.
- C. During the progress of the Work, CONTRACTOR shall monitor the estimate final quantity of work to be performed for each bid item. If the estimated final quantity exceeds the quantity indicated on the Bid Schedule by more than 10%, then CONTRACTOR shall notify OWNER of the discrepancy and shall not construct units beyond the quantity found on the Bid Schedule without prior approval.

1.03 BID ITEMS

A. Bid Item 1 – Mobilization/Demobilization

1. Measurement for payment will not be made for this item.
2. Payment will be made at the lump sum price listed in the proposal for this bid item.
3. The price shall include and cover the furnishing of all materials, labor, tools, and equipment necessary for the assembling and setting up for the project, including: the initial movement of personnel and equipment to the project site; application, fee payment and acquisition for all necessary permits; the establishment of the CONTRACTOR's shops, plants, storage areas, field office, temporary water, electrical, telephone, sanitary and other temporary facilities; insurance; and other initial expenses required for the start of Work. The price shall also include and cover the furnishing of all materials, labor, tools, and equipment necessary for final project closeout, including: the final movement of personnel and equipment from the project site; dismantling of the CONTRACTOR's shops, plants, storage areas, field office, temporary water, electrical, telephone, sanitary and other temporary facilities; final cleaning; and all other activities required for project closeout.
4. The lump sum price shall include, but is not limited to, the following:
 - a. preparation of a project schedule;
 - b. preparation of a Site Specific Health and Safety Plan; and
 - c. preparing and maintaining all project safety and other records required by this Contract.
5. The lump sum price shall include and cover demobilizing all materials, labor, tools, and personnel and equipment from the project site; dismantling of CONTRACTOR's shops, plants, storage areas, field office, temporary water, electrical, telephone, sanitary, and all other activities required for the project closeout, as described in Specification Section 01775.

B. Bid Item Number 2 – Performance Bond

1. Measurement for payment will not be made for this Bid Item.
2. The lump sum price listed in the Bid Form for this Bid Item shall be five percent of the total bid.
3. The lump sum price shall include and cover the cost of furnishing and maintaining performance bond as required for the duration of the Work.

Bid Items 3 through 5 – Interior Tipping Floor

C. Bid Item Number 3a – Demolition – Bays 1 and 2: 8-in Tipping Floor Replacement Section

1. Measurement for payment will be made on a per square foot basis.
2. Payment of the unit price listed in the Bid Form for this Bid Item will be based on the as-built area of actual work accomplished as listed in the Bid Schedule.
3. The per square foot bid price shall include all labor, tools, equipment, supervision, materials, and testing necessary to demolish the existing 8-inch tipping floor slab at the locations shown on the Drawings. The unit price includes appropriate demolition of concrete slab around rebar area at perimeter walls to protect rebar, as described in the Drawings. The unit price also includes, but is not limited to, removal of existing aggregate subbase and (if encountered) removal of unsuitable or saturated subgrade soils below the Bays 1 and 2 of the tipping floor and transporting it to an on-site location for disposal.
4. No payment will be made for stored materials.

D. Bid Item Number 3b – Demolition – Bays 3 and 4: 12-in Tipping Floor Replacement Section

1. Measurement for payment will be made on a per square foot basis.
2. Payment of the unit price listed in the Bid Form for this Bid Item will be based on the as-built area of actual work accomplished as listed in the Bid Schedule.
3. The per square foot bid price shall include all labor, tools, equipment, supervision, materials, and testing necessary to demolish the existing 12-inch tipping floor slab at the locations shown on the Drawings. The unit price includes, but is not limited to, appropriate demolition of concrete slab around rebar area at perimeter walls to protect rebar, as described in the Drawings.
4. No payment will be made for stored materials.

E. Bid Item Number 4 – Bays 1 and 2 Tipping Floor Subbase Preparation

1. Measurement for payment will be made on a per square foot basis.
2. Payment of the unit price listed in the Bid Form for this Bid Item will be based on the as-built area of actual work accomplished as listed in the Bid Schedule.
3. The per square foot bid price shall include all labor, tools, equipment, supervision, materials, and testing necessary to prepare the Bays 1 and 2 subbase for tipping floor replacement as shown on the Drawings. The unit price includes, but is not limited to, the following:
 - a. smooth and compact existing subgrade soils;
 - b. prepare CQC submittals;
 - c. supply and install woven geotextile separation fabric;

- d. supply and place aggregate subbase; and
 - e. conduct CQC necessary to document field moisture-density testing of fill.
4. No payment will be made for stored materials.
- F. Bid Item Number 4CON – Contingency for Bays 3 and 4 Tipping Floor Subbase Preparation
1. Measurement for payment will be made on a per square foot basis.
 2. Contingency may only be applied upon receiving authorization from OWNER and ENGINEER.
 2. Payment of the unit price listed in the Bid Form for this Bid Item will be based on the as-built area of actual work accomplished as listed in the Bid Schedule.
 3. The per square foot bid price shall include all labor, tools, equipment, supervision, materials, and testing necessary to remove and replace unsuitable subbase at Bays 3 and 4, if encountered. The unit price includes, but is not limited to, the following:
 - a. smooth and compact existing subgrade soils;
 - b. prepare CQC submittals;
 - c. supply and install woven geotextile separation fabric;
 - d. supply and place aggregate subbase; and
 - e. conduct CQC necessary to document field moisture-density testing of fill.
 4. No payment will be made for stored materials.
- G. Bid Item Number 5 – Tipping Floor Slab Replacement in Bays 1 through 4
1. Measurement for payment will be made on a per square foot basis.
 2. Payment of the unit price listed in the Bid Form for this Bid Item will be based on the as-built area of actual work accomplished as listed in the Bid Schedule.
 3. The per square foot bid price shall include all labor, tools, equipment, supervision, materials, and testing necessary to supply and install the replacement 12-inch concrete tipping floor as shown on the Drawings. The unit price includes, but is not limited to, the following:
 - a. prepare CQC submittals;
 - b. supply and place 6,000 psi steel-fiber-reinforced concrete;
 - c. install concrete finishing, saw cutting, and filling joints;
 - d. conduct CQC necessary to document testing of slump and air entrainment of concrete; and
 - e. conduct CQC testing necessary to document 28-day compressive strength.
 4. No payment will be made for stored materials.

Bid Items 6 and 7 – Other

H. Bid Item Number 6 – Construct Bollards

1. Measurement for payment will be made on a per unit installed basis.

2. Payment of the unit price listed in the Bid Form for this Bid Item will be based on the as-built number of units accomplished as listed in the Bid Schedule.
 3. The unit sum price shall include all labor, tools, equipment, supervision, materials, and testing necessary to replace existing interior bollards and construct an additional bollard between Bays 1 and 2 as described in the Drawings. The unit price shall include appropriate removal and re-installation of exterior bollards as described in the Drawings.
 4. No payment will be made for stored materials.
- I. Bid Item Number 7OPT – Tacked-on Stormwater Diversion Curb
1. Measurement for payment will be made on a per square foot basis.
 2. Payment of the unit price listed in the Bid Form for this Bid Item will be based on the as-built area of actual work accomplished as listed in the Bid Schedule.
 3. The per square foot bid price shall include all labor, tools, equipment, supervision, materials, and testing necessary to remove existing asphalt and subgrade, supply and install the placement 12-inch concrete diversion curb and seal the slab joint as shown on the Drawings.
 4. The depth of the below grade portion of the diversion curb below surrounding surface may be extended or reduced up to 6 inches to coincide with the bottom of the surrounding pavement substructure, to include existing asphalt and subbase aggregate.

OPTIONAL Bid Items 8 through 10 – Exterior Concrete Apron Area

J. Bid Item Number 8OPT – Demolition – Exterior Apron Area Replacement Section

1. Measurement for payment will be made on a per square foot basis.
2. Payment of the unit price listed in the Bid Form for this Bid Item will be based on the as-built area of actual work accomplished as listed in the Bid Schedule.
3. The per square foot bid price shall include all labor, tools, equipment, supervision, materials, and testing necessary to demolish the exterior paved apron at the locations shown on the Drawings. The unit price includes, but is not limited to, removing existing aggregate and unsuitable or saturated subbase materials below the exterior apron area pavement and transporting it to an on-site location for disposal.
4. No payment will be made for stored materials.

K. Bid Item Number 9OPT – Exterior Apron Area Subbase Preparation

1. Measurement for payment will be made on a per square foot basis.
2. Payment of the unit price listed in the Bid Form for this Bid Item will be based on the as-built area of actual work accomplished as listed in the Bid Schedule.
3. The per square foot bid price shall include all labor, tools, equipment, supervision, materials, and testing necessary to prepare the subbase for exterior pavement

replacement as shown on the Drawings. The unit price includes, but is not limited to, the following:

- a. smooth and compact existing subgrade soils;
 - b. prepare CQC submittals;
 - c. supply and install woven geotextile separation fabric;
 - d. supply and place aggregate subbase; and
 - e. conduct CQC necessary to document field moisture-density testing of fill.
4. No payment will be made for stored materials.

L. Bid Item Number 10OPT – Exterior Apron Area Slab Replacement

1. Measurement for payment will be made on a per square foot basis.
2. Payment of the unit price listed in the Bid Form for this Bid Item will be based on the as-built area of actual work accomplished as listed in the Bid Schedule.
3. The per square foot bid price shall include all labor, tools, equipment, supervision, materials, and testing necessary to supply and install the replacement 12-inch concrete apron as shown on the Drawings. The unit price includes, but is not limited to, the following:
 - a. prepare CQC submittals;
 - b. supply and place 6,000 psi steel-fiber-reinforced concrete;
 - c. install concrete finishing, saw cutting, and filling joints;
 - d. conduct CQC necessary to document testing of slump and air entrainment of concrete; and
 - e. conduct CQC testing necessary to document 28-day compressive strength.
4. No payment will be made for stored materials.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 APPLICATION FOR PAYMENT FORM

- A. Contractor shall use the Application for Payment Form provided in this Section.

3.02 SUPPORT DOCUMENTATION FOR APPLICATIONS FOR PAYMENT

- A. CONTRACTOR is responsible to obtain and submit all documentation, including all measurement and quantity computations, required for verification of pay applications. ENGINEER shall verify measurements and quantities for payment.

- B. Should ENGINEER determine that insufficient data has been submitted to accurately verify a pay application, ENGINEER shall notify CONTRACTOR of deficiencies. CONTRACTOR shall address identified deficiencies prior to further review of the pay application.

- C. In the event that survey data provided by CONTRACTOR is not sufficient to determine actual pay quantity, and the status of Work prevents additional data from being obtained, ENGINEER shall attempt to reasonably estimate the pay quantity based upon available information. ENGINEER's estimate shall be final.

APPLICATION FOR PAYMENT

TRANSFER STATION REPAIRS AND IMPROVEMENTS CONSTRUCTION PROJECT

CONTRACTOR: _____ CONTRACT DESCRIPTION:

Agreement by and between
_____ and the Northeast Maryland Waste Disposal Authority as
thereafter amended or changed pursuant to the terms and
OWNER: Carroll County Department of Public Works conditions of such Agreement (herein referred to as
225 N. Center Street, Room 221 the "Agreement") for the satisfactory performance of
Westminster, Maryland 21157 all necessary and/or related Work to properly complete
construction of the project at the Site.

PROJECT: Transfer Station Repair Project
Contract Number SW-08-01

PERIOD: From: _____ To: _____

AGREEMENT PRICE SUMMARY:

ORIGINAL AGREEMENT PRICE	\$ _____
Net change by Change Orders	\$ _____
REVISED AGREEMENT PRICE	\$ _____

PAYMENT CALCULATION:

TOTAL COMPENSATION FOR WORK COMPLETED TO DATE (completed work is detailed in this application)	\$ _____
LESS: RETAINAGE (10%)	\$ (_____)
TOTAL COMPENSATION AMOUNT	\$ _____
LESS: Amounts previously paid by OWNER	\$ (_____)

LESS: Previous approved Payment Applications which have
not yet been paid by OWNER \$ (_____)

LESS: Disputed amounts \$ (_____)

CURRENT PAYMENT APPLICATION AMOUNT \$ _____

Supplemental Information:

SUBCONTRACTOR'S VALUE OF WORK

Total Value of All Subcontractor's Work Completed to Date \$ _____

Total Value of All Subcontractor's Work for this Payment Application \$ _____

CERTIFICATION:

CONTRACTOR certifies that the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by CONTRACTOR to its subcontractors, materialmen, and suppliers for Work for which previous Applications for Payment were submitted by CONTRACTOR.

CONTRACTOR:

By: _____ STATE OF _____)

Printed Name: _____ COUNTY OF _____)

Title: _____

Subscribed and sworn to before me this _____
day of _____, 202__.

Notary Public:

My commission expires:

APPLICATION FOR PAYMENT
ITEMIZED PAYMENT SUMMARY

Item No.	Description	Unit	Unit Price (\$)	Completed This Period	Amount Requested This Period (\$)	Completed To Date	Amount Completed To Date (\$)
1	Mobilization / Demobilization	LS					
2	Performance Bond	LS					
3A	Demolition – 8” Tipping Floor Replacement	SF					
3B	Demolition – 12” Tipping Floor Replacement	SF					
4	Bays 1 and 2 Tipping Floor Subbase Preparation	SF					
4CON	CONTINGENCY - Bays 3 and 4 Tipping Floor Subbase Preparation	SF					
5	Tipping Floor Slab Replacement	SF					
6	Construct Bollards	Unit					
7OPT	Tacked-On Stormwater Diversion Curb	SF					
8OPT	Demolition – Outdoor Apron Area Replacement Section	SF					
9OPT	Outdoor Apron Area Subbase Preparation	SF					
10OPT	Outdoor Apron Area Slab Replacement	SF					

[END OF SECTION]

SECTION 01310

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 ORGANIZATION

- A. OWNER's Project Manager shall be Cliff Engle, Chief of the Bureau of Solid Waste.
- B. ENGINEER shall be Thomas B. Ramsey, P.E., of Geosyntec Consultants.
- C. CONTRACTOR shall identify its Project Manager as the primary contact for the performance of the Work.

1.02 PRECONSTRUCTION MEETING

- A. OWNER shall schedule a Preconstruction Meeting at the Site or other convenient location prior to commencement of construction activities.
- B. OWNER, ENGINEER, and CONTRACTOR and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the meeting by persons familiar with, and authorized to, conclude matters relating to the Work.
- C. OWNER shall prepare the agenda for the meeting, which shall include items of significance that could affect progress including such topics as:
 - 1. Health and Safety;
 - 2. Tentative construction schedule;
 - 3. Critical work sequencing;
 - 4. Designation of responsible personnel;
 - 5. Construction quality control requirements;
 - 6. Procedures for processing field decisions and change orders;
 - 7. Procedures for processing applications for payment;
 - 8. Distribution of Contract Documents;
 - 9. Submittal of shop drawings, product data, and samples;
 - 10. Preparation of record documents;
 - 11. Use of the premises;
 - 12. Office, work, and storage areas;
 - 13. Equipment deliveries and priorities;
 - 14. Security;
 - 15. Housekeeping; and

16. Working days and hours.

- D. Prior to the Preconstruction Meeting, CONTRACTOR shall provide, in a manner satisfactory to OWNER and ENGINEER, the following preconstruction submittals:
1. Health and Safety Plan;
 2. construction progress schedule;
 3. preliminary schedule of construction submittals (i.e., material certifications, concrete mix, CQC test data, etc.);
 4. the Schedule of Values with completed quantities and unit pricing for use in CONTRACTOR Applications for Payment;
 5. evidence of insurance required by XIII of Invitation for Bid; and
 6. performance bond as required by X and XVI of Invitation for Bid.

1.03 PROGRESS MEETINGS

- A. At a minimum, biweekly construction progress meetings will be facilitated by OWNER or ENGINEER at the Site or other convenient location. OWNER will notify CONTRACTOR and ENGINEER of scheduled meeting dates. More frequent meetings shall be held at OWNER's discretion.
- B. In addition to OWNER, ENGINEER, and CONTRACTOR, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.
- C. No later than seven (7) days after each progress meeting date, OWNER or ENGINEER will distribute copies of the meeting minutes to each party present and to other parties who ought to have been present. The minutes will include a brief summary, in narrative form, of progress since the previous meeting. Any party disagreeing with the accuracy or completeness of such minutes shall notify ENGINEER within ten (10) days of receipt of minutes or otherwise be deemed to agree with the minutes as prepared.

1.04 PROBLEM OR WORK DEFICIENCY MEETING

- A. A special meeting shall be held when and if a problem or deficiency is present or likely to occur. At a minimum, OWNER, ENGINEER, and CONTRACTOR shall attend the meeting, along with any affected subcontractors. The purpose of the meeting is to define and resolve the problem or work deficiency.
- B. OWNER or ENGINEER shall document the meeting and shall transmit minutes to the meeting attendees and others as appropriate.

1.05 PROGRESS SCHEDULES

- A. The progress schedule shall be furnished at within fourteen (14) days prior to the Preconstruction Meeting and shall be updated and submitted to ENGINEER no less than two (2) days before each bi-weekly progress meeting throughout the duration of the Contract. Throughout the Project, CONTRACTOR shall furnish in duplicate, graphic type construction progress schedules, listing trade divisions and all parts of Work, and showing the planned start date and completion time for each part of the Work.

1.06 ADMINISTRATION OF CONTRACT

- A. CONTRACTOR shall follow the Drawings strictly and execute all Work in accordance therewith, and with the kind and quality of materials set forth in the Technical Specifications, using the figured dimensions marked on the Drawings and not scaled measurements, unless approved by ENGINEER.
- B. The Drawings and the Technical Specifications shall be coordinated, so that any Work shown on the Drawings and not mentioned in the Technical Specifications, and vice-versa, shall be executed in the same manner as though mentioned in the Technical Specifications and shown in the Drawings.
- C. CONTRACTOR shall furnish and install such Work and material as may be proper and suitable preparation, basis, support, or finish for the Work that is shown or specified, whether or not the same is specifically mentioned in the Technical Specifications or shown on the Drawings. CONTRACTOR shall be required to make plural and complete Work that is shown single or partially indicated to avoid needless repetition, for the sake of brevity, and for reasons of clarity. In all cases, the intent and meaning of the Drawings and Technical Specifications, as defined herein, shall be followed.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

[END OF SECTION]

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. CONTRACTOR shall submit Shop Drawings, Record Documents, Working Drawings, supplier's certificates of compliance, manufacturer's warranties, and manufacturer's operations and maintenance information, in accordance with the relevant Section of the Technical Specifications.

1.02 DEFINITIONS

- A. Shop Drawings are all drawings, diagrams, illustrations, brochures, schedules, and other data prepared by CONTRACTOR, subcontractor, manufacturer, fabricator, supplier, or distributor, that illustrates how specific portions of the Work shall be fabricated or installed.
- B. Record Documents include drawings, diagrams, or illustrations that are prepared by CONTRACTOR during construction to illustrate the final work product to ENGINEER and OWNER. Record Documents include, but are not limited to: (i) As-built Surveys, which are drawings prepared by a Professional Land Surveyor licensed in the State of Maryland; and (ii) Working Drawings, which shall be used to communicate Work progress or status while Work is underway, but not yet complete; and (iii) red-line drawings, which are edits made by CONTRACTOR to the design drawings to illustrate deviations between the original design and as-built conditions
- C. Supplier's certifications of compliance are information provided by the material supplier to CONTRACTOR to document that the material or equipment supplied meets the required physical properties and quality control.
- D. Manufacturer's warranties are material and/or performance guarantees covering specific materials and/or assembled equipment, provided by manufacturer to CONTRACTOR, for a specified period.
- E. Manufacturer's operations and maintenance information are drawings, diagrams, illustrations, schedules, and other data provided by manufacturer to CONTRACTOR describing the proper assembly, use, shut-down, disassembly, and maintenance required for equipment provided by the manufacturer.

1.03 IDENTIFICATION

- A. The Shop and Working Drawings shall have the following identification data contained thereon: (i) Project name; (ii) Contract Number; and (iii) description of the item.
- B. The Shop and Working Drawings shall reference the particular Technical Specification section or Drawing Sheet number. Each revised submission shall be numbered sequentially in order of the original submission. Resubmittals shall include the original submittal number and be lettered sequentially (i.e., A, B, C, etc.).

1.04 SUBMITTALS

- A. At least seven (7) days prior to Preconstruction Meeting, CONTRACTOR shall submit to ENGINEER a list of all project submittals that will be made and the tentative dates that they will be submitted for review. ENGINEER and CONTRACTOR will use the submittal list throughout the Project to communicate submittal requirements and responsibilities.
- B. CONTRACTOR shall maintain the submittal log in current and correct condition. CONTRACTOR shall provide to ENGINEER, an updated submittal log with each submittal submission.
- C. For required submittals, CONTRACTOR shall submit one (1) original document and two (2) copies to ENGINEER for review and acceptance. If CONTRACTOR wishes to provide a submittal in electronic format, coordinate with ENGINEER for submittal addresses.
- D. For the convenience of CONTRACTOR, the following listing enumerates submittal requirements stipulated herein and specified within other sections of the Technical Specifications. The listing may not include certain submittal requirements found elsewhere in these Technical Specifications. All such submittal requirements stipulated elsewhere must be complied with. Items to be submitted include, but are not necessarily limited to, the following:

Administrative:

- 1. Health and Safety Plan;
- 2. Construction progress schedule (Section 01310);
- 3. Performance bond;
- 4. Certificates of insurance;
- 5. Submittal log (Section 01330);

6. Schedule of values (Section 01270); and
7. CQC Consultant qualifications (Section 01450).

Supplier's Certificates of Compliance:

1. Cement (Section 03300);
2. Aggregates for concrete (Section 03300);
3. Concrete admixtures (Section 03300);
4. Aggregates (Section 02060); and
5. Woven geotextile.

Miscellaneous:

1. Design mixes for concrete (Section 03300); and
2. Concrete delivery batch tickets (Section 03300)

1.05 SHOP DRAWINGS

- A. Shop Drawings shall be submitted for all materials, equipment, accessories, and appurtenances as specified or shown on the Drawings prior to the fabrication, installation, or incorporation of the specified materials, equipment, accessories, and appurtenances in the Work.
- B. All Shop Drawings shall be prepared to scale, shall be accurate and distinct, and shall give all dimensions required for the fabrication, installation, and incorporation of the specified items in the Work. Wherever the location of any of the materials, equipment, accessories, and appurtenances is not shown on the Drawings, CONTRACTOR shall furnish prints of Shop Drawings for the purpose of giving the exact location in plan and in elevation of the said materials, equipment, accessories, and appurtenances.
- C. At the time of submission, CONTRACTOR shall call to OWNER's and ENGINEER's attention, in writing, any deviations that the Shop Drawings may have from the requirements of the Drawings and the Technical Specifications.

1.06 FINAL RECORD DRAWINGS

- A. Final Record Drawings are not required for this Project.

1.08 SUBMITTAL REVIEW

- A. CONTRACTOR shall make diligent effort to provide complete, accurate, and responsive submittals requiring minimal or no revision. Contract Times provided in the Agreement shall not be extended as a result of late or rejected submittals or for time required by ENGINEER to review CONTRACTOR submittals.
- B. ENGINEER shall review submittals within fourteen (14) days of receipt, with the exception of substitution and “or-equal” submittals, which shall have a twenty-one (21) day review time.
- C. After review, ENGINEER shall mark submittals as either: (i) No Exceptions Taken; (ii) Amend – Resubmit; (iii) Rejected – Resubmit; or (iv) Not Reviewed – For Information Only.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

[END OF SECTION]

SECTION 01450

CONSTRUCTION QUALITY CONTROL AND QUALITY ASSURANCE

PART 1 GENERAL

1.01 SUMMARY

- A. CONTRACTOR shall assign one person as the Quality Control Manager for the Project. The Quality Control Manager shall be responsible for preparing and submitting quality control certifications and test results to ENGINEER, as applicable.
- B. CONTRACTOR shall maintain an appropriate frequency of contact with ENGINEER and OWNER to ensure that Work quality is being maintained.
- C. CONTRACTOR shall perform Construction Quality Control (CQC) field and laboratory testing as required by the Drawings and the Technical Specifications. If CONTRACTOR is unable to self-perform these tasks, CONTRACTOR shall retain a CQC Consultant to complete the required CQC field and laboratory testing.
- D. Field and laboratory testing of structural fill and cast-in-place concrete shall be performed by Quality Control Manager or CQC Consultant currently accredited by one or more of the following:
 - 1. Concrete Materials Engineering Council; and/or
 - 2. Other accreditation authority of equivalent standing to the above, on the basis of its compliance with the requirements of ASTM C 1077.

1.02 DEFINITIONS

- A. Construction Quality Control (CQC) actions are those that provide a means to measure and regulate the characteristics of an item or service to contractual and regulatory requirements.
- B. CQC refers to those actions taken by the manufactures, fabricators, installers, or CONTRACTOR to ensure that the materials and the workmanship meet the requirements of the Drawings and the Technical Specifications.

1.03 SUBMITTALS

- A. At least seven (7) days prior to the Preconstruction Meeting, CONTRACTOR shall: (i) identify the Quality Control Manager; and (ii) identify CONTRACTOR's CQC Consultant.

- B. At least seven (7) days prior to the Preconstruction Meeting, CONTRACTOR shall submit information to ENGINEER describing the qualifications and capabilities of the CQC Consultant. The CQC Consultant shall be acceptable to both OWNER and ENGINEER.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 GENERAL

- A. CONTRACTOR shall be responsible for obtaining quality control documentation, or performing quality control tests as described in the Technical Specifications.
- B. Quality control testing procedures and frequencies for individual products and material are described in the Technical Specifications.

3.02 SAMPLING AND TESTING

- A. CONTRACTOR shall perform all testing during construction and shall promptly provide all test results to ENGINEER and OWNER. CONTRACTOR shall be responsible for cooperating with ENGINEER and OWNER during all testing activities and in resolving all problems identified during CQC testing. CONTRACTOR shall provide all equipment and labor for all required testing. CONTRACTOR shall repair any damage to finished Work caused by sampling or testing activities.
- B. Material sampling and testing for concrete is the responsibility of CONTRACTOR and shall be performed by the CQC Consultant. CONTRACTOR and its subcontractor(s) shall provide equipment and labor for all testing. CONTRACTOR and its subcontractor(s) shall repair any damage to finished Work caused by sampling or testing activities. ENGINEER shall monitor the testing activities.
- C. CONTRACTOR shall be responsible for geometric control of the Work. Any surveying that may be performed by OWNER, ENGINEER, or CQA Consultant does not relieve CONTRACTOR of its responsibility to layout, control, and document its Work. Any additional CQC surveying that is required, if the initial CQC survey shows that the Work has not yet been completed to the lines and grades shown on the Drawings, shall be performed at the expense of CONTRACTOR.
- D. CONTRACTOR shall abide by all qualification requirements identified in these Technical Specifications (for subcontractors, suppliers, manufacturers, etc.).

- E. The work shall, at all times, be subject to the observation of OWNER and/or ENGINEER. Observation or non-observation by OWNER and/or ENGINEER shall not relieve CONTRACTOR from his contractual obligation to furnish work and materials as required, and properly complete the Work in accordance with these Contract Documents. If OWNER or ENGINEER considers that the Work is not being properly accomplished, he may condemn or reject all or any part of the Work and any materials or equipment incorporated into the Work. If any material, equipment, or the Work is condemned or rejected by OWNER or ENGINEER, CONTRACTOR shall bear all expenses for removal and proper replacement of such material, equipment, or Work required to be provided by Contract Documents. The expense of replacing any Work performed by others that is adversely affected by removal and proper replacement of improper Work performed by CONTRACTOR shall be borne by CONTRACTOR.
- F. ENGINEER's presence does not include supervision or direction or the actual work by CONTRACTOR, his employees, or agents. Neither the presence of ENGINEER nor any observations and testing performed by either party shall excuse CONTRACTOR from defects discovered in his work.
- G. ENGINEER or OWNER has the right to perform quality assurance testing and to observe the Work at any time.

3.03 PROTECTION

- A. CONTRACTOR shall use all means necessary to protect all prior Work, including all materials and completed Work of other sections.

3.04 SUBSTANDARD WORK OR MATERIALS

- A. Any defective or substandard Work or materials furnished by CONTRACTOR that is discovered before the final acceptance of the Work, as established by ENGINEER's Certificate of Substantial Completion, or during the subsequent guarantee period, shall be removed immediately by CONTRACTOR even if it had been initially overlooked by ENGINEER and recommended for payment. Satisfactory work or materials shall be substituted by CONTRACTOR for that rejected.
- B. ENGINEER may order tests on substandard or damaged Work, equipment, or materials to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of such tests shall be borne by CONTRACTOR, and the nature, extent, and supervision of the tests will be as determined by ENGINEER. If the results of the tests indicate that the required functional capability of the Work, equipment, or material is not impaired, consistent with the final general appearance of same, the Work, equipment, or materials may be deemed substandard and shall be

replaced by CONTRACTOR. CONTRACTOR may elect to replace the substandard work or material in lieu of performing the tests.

[END OF SECTION]

SECTION 01510

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

- A. This section includes descriptions of temporary facilities and controls necessary for the Work.
- B. Temporary facilities and controls that are addressed in this Section include:
 - 1. field office and telephone;
 - 2. temporary potable water service;
 - 3. temporary sanitary and first aid facilities;
 - 4. noise control;
 - 5. dust control;
 - 6. fire prevention control;
 - 7. pollution control;
 - 8. roads, access and parking areas;
 - 9. protection of personnel, Work, and property;
 - 10. temporary signs;
 - 11. temporary pumping;
 - 12. trucking;
 - 13. relocation or removals;
 - 14. CONTRACTOR's use of premises;
 - 15. security; and
 - 16. clean-up during construction.

1.02 FIELD OFFICE AND TELEPHONES

- A. CONTRACTOR may, at its own discretion, provide a field office for its own use and for meetings with OWNER and ENGINEER. If provided, CONTRACTOR shall coordinate the location of the trailer with OWNER.
- B. CONTRACTOR shall provide mobile telephone service to its superintendent for the purpose of contacting CONTRACTOR during the Project.

1.03 TEMPORARY POTABLE WATER SERVICE

- A. CONTRACTOR shall make arrangements for supply of potable water to its employees during construction.

1.04 TEMPORARY SANITARY AND FIRST AID FACILITIES

- A. CONTRACTOR shall provide temporary toilet accommodations and first aid supplies for workers on the Project, including all workers employed by subcontractors. Toilets shall be located in an area approved by OWNER and shall be maintained in a sanitary condition. Sanitary and first aid requirements include:
 - 1. Provide at least one unit for every 20 persons, or fraction thereof.
 - 2. Provide first aid stations at Work areas and in CONTRACTOR's field office.
 - 3. Post telephone numbers of emergency services and hospitals at conspicuous locations at the Site.
 - 4. Provide facilities and fixtures in compliance with OSHA regulations and all other applicable Federal, State, and local laws and regulations.
 - 5. Enforce proper use of sanitary facilities, including preventing the committing of nuisances in buildings on the Site. Employees who violate this rule shall be discharged. Dispose of all wastes in conformance with applicable regulations.

1.05 NOISE CONTROL

- A. CONTRACTOR's vehicles and equipment shall be configured in a manner that minimizes noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and in no case shall noise levels be permitted to interfere with the Work of OWNER or others.

1.06 DUST CONTROL

- A. CONTRACTOR shall be responsible for controlling objectionable dust caused by operation of vehicles and equipment, or any other activities within the Work area. CONTRACTOR shall keep dust in the air to a minimum. CONTRACTOR shall control dust by spraying water as described in the latest version of "*Maryland Erosion and Sediment Control Handbook*".

1.07 FIRE PREVENTION CONTROL

- A. CONTRACTOR shall take all precautions necessary to prevent fires and explosions. CONTRACTOR is advised that flammable and explosive gases are naturally generated at landfills and may be present in and adjacent to the Work area.

- B. Fuel for cutting and heating torches shall be contained in containers approved by the Underwriter's Laboratory.
- C. CONTRACTOR shall furnish and maintain a 20-pound maximum capacity dry chemical type fire extinguisher in the immediate vicinity of the Work when welding tools or torches of any type are in use.

1.08 POLLUTION CONTROL

- A. CONTRACTOR shall provide methods, means and facilities required to prevent contamination of soil, water, or atmosphere by discharges from construction operations.
- B. CONTRACTOR shall provide the methods, means and facilities required to prevent contamination of soil, water, or atmosphere from discharges of waste, leachate, or landfill gas resulting from damage to existing structures and/or equipment by CONTRACTOR.
- C. CONTRACTOR's equipment used during construction shall conform to current Federal, State, and local laws and regulations regarding pollution control.
- D. The AUTHORITY OR OWNER will have the option of performing a complete inspection of all vehicles at any time throughout the term of the agreement. In the event that any vehicle, when inspected, and in the sole determination of the AUTHORITY OR OWNER, fails to meet standards that the AUTHORITY OR OWNER determines are necessary to complete the agreement or to operate safely, the AUTHORITY OR OWNER may require such vehicle to be brought to standard before being placed back in service.

1.09 ROADS, ACCESS AND PARKING AREAS

- A. Use of existing site access roads will be permitted to CONTRACTOR's personnel who lawfully frequent the Project Site. CONTRACTOR's vehicles shall in all cases yield to waste hauling or other trucks or equipment when operating on Site access roads.
- B. Existing roads shall be kept open by CONTRACTOR for the passage of vehicular traffic and pedestrians during the construction period unless otherwise approved by OWNER.
- C. CONTRACTOR shall provide signs, signals, barricades, lights, and personnel to regulate all traffic and to warn vehicles and personnel of hazards. Routes of ingress and egress to the location of the Work shall be clearly marked by CONTRACTOR and approved by OWNER.

- D. CONTRACTOR's personnel shall use only those use parking areas designated for the Work. Storage of materials or parking of vehicles or equipment in areas not approved by OWNER is prohibited.
- E. CONTRACTOR shall maintain storage and Work areas free of debris and obstructions.

1.10 PROTECTION OF PERSONNEL, WORK, AND PROPERTY

- A. CONTRACTOR shall follow the requirements of the Health and Safety Plan.
- B. CONTRACTOR shall protect all existing structures and utilities not marked for removal and shall make all necessary repairs at its own expense to same, where CONTRACTOR is required, to disturbed existing structures or utilities or existing structures or utilities become damaged from activities associated with the new construction Work.
- C. CONTRACTOR shall provide equipment with proper safety devices as required by Federal, State, and local laws and regulations.
- D. CONTRACTOR shall provide all scaffolding, staging, platforms, temporary flooring, railing, stairs, shoring, bracing, sheet, and fall protection, etc. for safe and proper execution of the Work as required by Federal, State, and local laws and regulations for the protection of personnel and the public. Temporary safety measures shall be removed when the Work is completed.
- E. Any Work damaged by failure to provide the protection required shall be removed and replaced with new Work at CONTRACTOR's expense.
- F. The location of any construction fencing, and areas for on-site storage of equipment and other facilities required by CONTRACTOR shall be subject to approval by OWNER and ENGINEER.

1.11 TEMPORARY SIGNS

- A. No sign or advertisement shall be displayed without OWNER's approval. Should directional signs be required, such signs shall be of size, color, and lettering that meets ENGINEER's approval.

1.12 TEMPORARY PUMPING

- A. CONTRACTOR shall install and maintain all necessary temporary drainage structures and shall perform temporary pumping as necessary to keep excavations and other areas within the limits of disturbance free from standing water and other liquids, regardless of the source.

- B. Temporary stormwater management or dewatering activities proposed by CONTRACTOR shall be subject to ENGINEER's approval.

1.13 TRUCKING

- A. All trucks bringing to or removing earth, loose materials, or debris from the Project Site shall be loaded in a manner to prevent dropping of materials on access roads or public streets.
- B. Earth, loose materials, or debris deposited on the access roads or streets due to trucking activities shall be removed daily by CONTRACTOR, regardless of the source of the debris.

1.14 RELOCATION OR REMOVALS

- A. Should a change in location of a temporary facility be necessary in order to continue progress of the Work, CONTRACTOR shall remove and relocate such items as directed without additional cost to OWNER.
- B. CONTRACTOR shall remove temporary facilities when they are no longer required and restore permanent facilities to their original or better condition.

1.15 CONTRACTOR'S USE OF PREMISES

- A. Areas for CONTRACTOR storage and execution of the Work is limited to areas in the immediate vicinity of the transfer station building. CONTRACTOR must obtain prior approval by OWNER for use of any other areas of the Site.
- B. CONTRACTOR shall:
 - 1. not unreasonably encumber the Site with materials or equipment;
 - 2. not load or surcharge existing structures or other facilities with equipment or supplies having a weight that will endanger the integrity of the structures;
 - 3. assume full responsibility for protection and safekeeping of CONTRACTOR's equipment, products or materials stored on the premises;
 - 4. move any stored products or equipment that interferes with operations of OWNER or other contractors;
 - 5. coordinate and cooperate with other contractors on Site;
 - 6. not restrict access to the Site by others; and
 - 7. stockpile materials removed from excavations within the Work area as directed by ENGINEER.

1.16 SECURITY

- A. CONTRACTOR shall protect completed Work, existing premises, and OWNER's operations against theft, vandalism, and unauthorized entry.
- B. CONTRACTOR shall coordinate Project Site security with OWNER's existing security system.
- C. CONTRACTOR shall restrict entrance of persons and vehicles into Project Site to only those working on the Project.
- D. CONTRACTOR shall allow entrance only to authorized persons with proper identification.

1.17 CLEAN-UP DURING CONSTRUCTION

- A. Clean-up shall be performed daily to prevent accidents to personnel, protect all Work in place, and to effect completion of the Work in an orderly manner. Trash containers or roll-off boxes shall be emptied promptly after becoming full. All construction debris must be placed in trash barrels or roll-off containers at the end of the working day.
- B. Construction clean-up shall consist of the removal of all mud, oil, grease, sand, gravel, dirt, trash, scrap, debris, and excess materials, from any floor space, ground, or walking surface, that may cause the tripping or sliding of Workers, ladders, or equipment. Particular attention shall be given to the removal of water from areas where electrical power tools are to be used.
- C. Burning of waste material is prohibited.
- D. All waste materials disposed of at the Northern Landfill must be trucked across the on-site scale facility for weighing prior to hauling to the working face.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

[END OF SECTION]

SECTION 01650

PRODUCT DELIVERY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Delivery of products shall be clearly labeled for this Project.
- B. Prior notice shall be given to OWNER for product deliveries.
- C. Products shall be stored in designated areas only.
- D. CONTRACTOR is solely responsible to direct product deliveries to the appropriate location at the Site.
- E. CONTRACTOR is solely responsible for unloading, storing, and protecting delivered materials.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

[END OF SECTION]

SECTION 01775

PROJECT CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 CLOSEOUT PROCEDURES

- A. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons for its decision. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected in order to reach Final Completion (e.g., a “Punch List”).

1.02 FINAL CLEANING

- A. Upon Substantial Completion of Work and prior to Final Completion, CONTRACTOR shall remove its equipment, signs, facilities, construction materials, and trash, and shall perform any other reasonable clean-up activities requested by OWNER and ENGINEER. All disturbed areas shall be revegetated or otherwise put into a condition satisfactory to OWNER and ENGINEER. Stabilization of disturbed areas shall be carried out in accordance with the Technical Specifications.
- B. Concrete surface shall have a broom finish.

1.03 SUBSTANTIAL COMPLETION AND FINAL COMPLETION

- A. The Work will be considered Substantially Complete based on ENGINEER’s review of the Work to establish that all the components necessary to operate the repaired transfer station have been completed and are operational. Components include, but are not limited to: concrete tipping floor repair, concrete apron repair, and bollard replacement. The 28-day cure time for concrete, including concrete cylinder testing indicating satisfactory compressive strengths have been reached, must be complete prior to substantial completion.

- B. Final Completion shall be reached when: (i) all CQC testing for soils and concrete required for the Project have been completed and acceptable results have been obtained; and (ii) ENGINEER has completed final inspection of the Work and CONTRACTOR has completed all noted deficiencies from the Punch List to the satisfaction of OWNER and ENGINEER; and (iii) CONTRACTOR has submitted red-line drawings indicating deviations between design and as-built conditions for the Work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

[END OF SECTION]

SECTION 02055

STRUCTURAL FILL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. CONTRACTOR shall furnish all labor, tools, supervision, transportation, and installation equipment necessary to place and compact structural fill as specified in this Section and as shown on the Drawings.
- B. Structural fill described in this Section shall be used for construction of the tipping floor subgrade under slab replacement area and exterior concrete apron area as described in Drawings.
- C. CONTRACTOR shall be prepared to place and compact soil in conjunction with the construction of other components of the Work.
- D. The Work of this Section shall include, but not necessarily be limited to:
 - 1. loading, transporting, placing, and compacting soil;
 - 2. sampling and testing (laboratory and field) soil; and
 - 3. disposal of surplus soil.
- E. Soil placed and compacted shall conform to the dimensions, lines, grades, and sections indicated on the Drawings.
- F. Structural Fill shall be obtained from an on-site stockpile as directed by OWNER.
- G. CONTRACTOR shall perform the required field and laboratory CQC tests described in this Section.

1.02 SUBMITTALS

- A. At least seven (7) days prior to starting structural fill placement and compaction, CONTRACTOR shall notify ENGINEER of the following:
 - 1. The date and time that fill placement and compaction operations will start; and
 - 2. The name of CONTRACTOR's representative who will be in charge of this phase of construction.

- B. As soon as the information is available, CONTRACTOR shall provide ENGINEER the results of field and laboratory tests performed on soil. Test reports of field tests are to be submitted by the following morning.
- C. If Work is interrupted for reasons other than inclement weather, then CONTRACTOR shall notify ENGINEER a minimum of 24 hours prior to the resumption of Work.

PART 2 PRODUCTS

2.01 GENERAL

- A. OWNER shall perform the following pre-qualification tests on structural fill that is proposed for use and shall provide the test results to ENGINEER and CONTRACTOR.
 - 1. Particle-Size Analysis, with hydrometer - ASTM D 422;
 - 2. Atterberg Limits - ASTM D 4318; and
 - 3. Standard Proctor - ASTM D 698.

2.02 STRUCTURAL FILL

- A. Structural fill shall consist of relatively homogeneous soil that is free of debris, foreign objects, excess silt, roots, and organics.
- B. Structural fill shall meet the Unified Soil Classification System (USCS) classification for GC, GM, SW, SP, or SM according to ASTM D 2487, and shall have a maximum PI of 15, as determined in accordance with ASTM D 4318.
- C. Structural fill shall have no particles larger than 4 in. in largest dimension.

2.03 EQUIPMENT

- A. CONTRACTOR shall only use equipment that has been approved by for this Work.
- B. CONTRACTOR shall furnish, operate, and maintain grading equipment as is necessary to produce uniform layers, sections, and smoothness of grade for compaction.
- C. CONTRACTOR shall furnish, operate and maintain compaction equipment as is necessary to produce the required in-place soil density and moisture content.

PART 3 EXECUTION

3.01 GENERAL

- A. Upon demolition of existing concrete tipping floor and subbase aggregate, CONTRACTOR shall remove existing soil fill which exhibits excessive moisture or pumping. The final limits of soil removal shall be confirmed by ENGINEER prior to placing Structural Fill.
- B. Structural Fill shall be placed and compacted to the lines and grades shown on the Drawings.
- C. Structural Fill shall be placed only on dry, unfrozen subgrade surfaces.
- D. Structural Fill shall be placed in loose lifts that result in a compacted lift thickness of 9 in. or less. Compaction shall be performed using a vibratory smooth-drum roller or padded-foot compactors as specified elsewhere in this Section. Hand compaction of material shall be used in locations where larger compaction is inappropriate due to limited area.
- E. Unless otherwise specified, each soil lift shall be compacted to at least 95% of the maximum dry density and at a moisture content between -3 to +2% of the optimum moisture content as determined by ASTM D 698. At CONTRACTOR's request, ENGINEER may consider revising the range of acceptable moisture contents based on the field and laboratory test results submitted by CONTRACTOR.
- F. CONTRACTOR shall finish the Structural Fill surface with a smooth-drum roller to create a smooth surface, free from ruts or indentations, which will provide a uniform surface for geotextile placement.

3.02 FIELD QUALITY CONTROL

- A. CONTRACTOR's CQC Consultant shall perform field quality control testing of soil during placement and compaction, as described below.
 - 1. The minimum testing frequencies for construction quality evaluation are presented in Table 02055-1.
 - 2. Sampling locations will be selected by CQC Consultant.
- B. Defective Areas:
 - 1. If a defective area is discovered in the compacted soil, CONTRACTOR's CQC Consultant shall proceed to determine the extent and nature of the defect. If the defect is indicated by an unsatisfactory test result, CQC Consultant shall determine the extent of the defective area by additional tests, observations, a review of records, or other means that ENGINEER deems appropriate. If the defect is related

- to adverse site conditions, such as overly wet soils or surface desiccation, then CQC Consultant shall define the limits and nature of the defect.
2. After the extent and nature of a defect has been determined, CONTRACTOR shall correct the deficiency to the satisfaction of ENGINEER. The cost of corrective actions shall be borne by CONTRACTOR.
 3. Additional testing will be performed by CQC Consultant to verify that the defect has been corrected. This additional testing will be performed before any additional work is allowed in the area of deficiency.

TABLE 02055-1

MINIMUM FIELD TESTING FREQUENCIES⁽¹⁾

TEST	METHOD	MINIMUM FREQUENCY OF TESTING
Moisture Content (Nuclear Gauge)	ASTM D 3017	minimum of three per lift
In-Place Dry Density (Nuclear Gauge)	ASTM D 2922	minimum of three per lift

Note:

- ⁽¹⁾ Field tests are to be performed by CQC Consultant on in-place compacted material.

[END OF SECTION]

SECTION 02060

AGGREGATE

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for the supply and placement of aggregate as specified in this Section and as shown on the Drawings.
- B. CONTRACTOR shall be prepared to place aggregate in conjunction with other components of the Work.
- C. The Work of this Section shall include procurement, testing, and placement of all aggregate.
- D. Aggregate placed shall conform to the dimensions, lines, grades, and sections indicated on the Drawings.
- E. Aggregate described in this Section shall be used for construction of concrete tipping floor slab subbase and gravel underdrain indicated on the Drawings.

1.02 SUBMITTALS

- A. At least ten (10) days prior to the delivery of any aggregate, CONTRACTOR shall provide ENGINEER the following information:
 - 1. the proposed source(s) for aggregate; and
 - 2. the results of a grain-size analysis on the proposed aggregate performed in accordance with ASTM C 136, and certification that the material has the correct gradation as specified in Part 2.01 of this Section.
- B. The tests identified in Part 1.02.A shall be carried out by CONTRACTOR's aggregate supplier for each proposed material source and type of aggregate.

PART 2 PRODUCTS

2.01 AGGREGATE

- A. Aggregate shall conform to AASHTO No. 57 sieve size.

PART 3 EXECUTION

3.01 FAMILIARIZATION

- A. Prior to placing any aggregate, CONTRACTOR shall carefully inspect the subgrade surface and verify that the surface is smooth, firm, and dry, and it graded to an elevation that allows the necessary minimum thickness of aggregate and concrete tipping floor to be installed.

3.02 INSTALLATION

- A. Aggregate shall be placed and compacted to the lines and grades shown on the Drawings.
- B. Geotextile placed underneath aggregate shall be placed over the full area of the repaired slab. Adjacent panels shall be overlapped a minimum of 4-in.
- C. Placement of aggregate shall be performed in a manner that does not damage underlying geotextile or cause excessive wrinkling or movement of underlying geotextile. Vehicles and heavy equipment are prohibited from operating directly on geotextile.
- D. Aggregate shall be placed only on dry, unfrozen subgrade surfaces.
- E. Aggregate shall be compacted using a smooth drum roller using a minimum of two (2) passes.

3.03 PRODUCT PROTECTION

- A. CONTRACTOR shall use all means necessary to protect all prior Work and materials and completed Work of other Sections.

[END OF SECTION]

SECTION 02071

GEOTEXTILE

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. CONTRACTOR shall furnish all geotextile, labor, incidental materials, tools, supervision, transportation, and installation equipment necessary for the installation of geotextile, as specified herein, and as shown on the Drawings.
- B. CONTRACTOR shall obtain the geotextile from a Geotextile Manufacturer that has demonstrated experience with geotextile manufacturing.
- C. CONTRACTOR shall install all geotextile and shall be responsible for field handling, storing, deploying, seaming or connecting, temporary restraining, anchoring, and other aspects of geotextile installation.
- D. CONTRACTOR shall be prepared to install geotextile in conjunction with the other components of the project.

1.02 SUBMITTALS

- A. At least 14 days prior to geotextiles being shipped, CONTRACTOR shall provide ENGINEER with the following documentation on the proposed geotextile:
 - 1. Manufacturer and product name
 - 2. Product cut sheets
 - 3. Minimum property values of the proposed geotextile and corresponding test procedures

PART 2 PRODUCTS

2.01 GEOTEXTILE PROPERTIES

- A. Unless otherwise noted on the Drawings, the Geotextile Manufacturer shall furnish materials whose “Minimum Average Roll Values”, as defined by the Federal Highway Administration (FHWA), meet or exceed the criteria specified in Table 02071-1.

2.02 PACKING AND LABELING

- A. Geotextile shall be supplied by the Geotextile Manufacturer in rolls wrapped in relatively waterproof and opaque protective covers.
- B. Geotextile rolls shall be marked or tagged with the following information:
 - 1. manufacturer's name;
 - 2. product identification;
 - 3. lot number;
 - 4. roll number; and
 - 5. roll dimensions.
- C. Geotextile rolls which cannot be identified per 2.03.B because of missing or damaged labels will be removed from the job site and replaced at no additional expense to the OWNER.

2.03 TRANSPORTATION

- A. CONTRACTOR shall be liable for all damages to the materials incurred prior to and during transportation.
- B. Geotextile shall be delivered to the Site at least seven (7) days before the scheduled date of deployment to allow the ENGINEER adequate time for taking inventory and obtaining additional conformance samples, if needed. CONTRACTOR shall notify OWNER a minimum of 24 hours prior to any delivery.

2.04 HANDLING AND STORAGE

- A. CONTRACTOR shall be responsible for handling, unloading, storage, and care of the geotextile prior to, during, and following installation. CONTRACTOR shall be liable for all damages to the geotextile incurred prior to final acceptance by OWNER and ENGINEER.
- B. CONTRACTOR shall be responsible for storage of the geotextile at the Site after the material is delivered and shall protect the geotextile from moisture, long-term direct exposure to sunlight, puncture, or other damaging or deleterious conditions (e.g., mud, dirt, and dust). CONTRACTOR shall be responsible for any additional storage procedures required by the Geotextile Manufacturer.

PART 3 EXECUTION

3.01 FAMILIARIZATION

- A. Prior to implementing any Work described in this Section, CONTRACTOR shall become thoroughly familiar with all portions of the Work falling within this Section.
- B. Prior to implementing any of the Work of this Section, CONTRACTOR shall carefully inspect the installed Work of all other Sections and verify that all such Work is complete to the point where the Work of this Section may properly commence without adverse impact.

3.02 HANDLING AND PLACEMENT

- A. The geotextile shall be handled in such a manner as to ensure that it is not damaged.
- B. Precautions shall be taken to prevent damage to underlying materials during placement of the geotextile.
- C. Geotextile shall not be placed on saturated or frozen subgrade or in standing water.

3.03 SEAMS AND OVERLAP

- A. Geotextile panels shall be overlapped a minimum of 3 in.

3.04 REPAIR

- A. Any holes or tears in the geotextile shall be repaired using a patch made from the same geotextile. Geotextile patches shall overlap undamaged material at least 12-inches. Should any tear exceed 33 percent of the width of the roll, that roll shall be removed and replaced.

3.05 MATERIALS IN CONTACT WITH GEOTEXTILE

- A. CONTRACTOR shall place aggregate on top of geotextile such that:
 - 1. the geotextile and underlying materials are not damaged; and
 - 2. excess stresses are not induced in the geotextile.
- B. Equipment shall not be driven directly on the geotextile.

TABLE 02071-1
REQUIRED WOVEN GEOTEXTILE PROPERTIES⁽¹⁾

PROPERTIES	QUALIFIERS	UNITS	VALUE	TEST METHOD
Construction Type	---	---	Slit film woven	---
Mass Per Unit Area	Minimum	oz/yd ²	5.8 (NOM 6)	ASTM D 5261
Grab Tensile Strength	Minimum	lb.	315	ASTM D 4632
Wide Width Tensile Strength	Minimum	lb/in	300 x 350	ASTM D 4595
Trapezoidal Tear Strength	Minimum	lb.	120	ASTM D 4533
CBR Puncture Strength	Minimum	lb.	950	ASTM D 6241

Note:

1. All values represent minimum average roll values (i.e., any roll in a lot should meet or exceed these values).

[END OF SECTION]

SECTION 03100

CONCRETE FORMS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. CONTRACTOR shall furnish all labor, materials, tools, and supervision necessary to construct the forms required for cast-in-place concrete construction as indicated on the Drawings and in this Section.
- B. CONTRACTOR shall be prepared to construct the forms in conjunction with other Work at the Site.
- C. CONTRACTOR shall be entirely responsible for meeting the requirements of this Section.

1.02 CONSTRUCTION QUALITY CONTROL

- A. Construction of the concrete forms may be monitored by ENGINEER.
- B. CONTRACTOR shall be aware of monitoring activities and shall account for these activities in the construction schedule.
- C. CONTRACTOR shall ensure that the materials and methods used for construction of the concrete forms meet the requirements of the Drawings and the Technical Specifications. Any material or method that does not conform to these documents, or to alternatives approved by ENGINEER will be rejected and shall be repaired or replaced by CONTRACTOR at no cost to OWNER.
- D. CONTRACTOR shall perform all Work in accordance with ACI 347.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Concrete formwork shall be designed for vertical loads and lateral pressures in accordance with the standards prescribed in ACI 347.
- B. Plywood forms shall be grade marked B-B Plyform, Exterior Class 1 and 2 Medium Density Overlaid Plywood Concrete Form, B-Matte Formguard, or equal, conforming

to the requirements of U.S. Product Standard PS-1, “*Construction and Industrial Plywood*”.

- C. Steel forms shall be a minimum 16-gauge steel, matched, tight fitting, and stiffened to support the weight of the concrete.
- D. Form ties shall be factory fabricated, snap-off metal ties of adequate design to minimize form deflection and preclude concrete spalling upon removal. The ties shall be fabricated to that set back in the concrete is such that the portion of the tie remaining after snap-off and removal of the exterior portions is at least 1½ in. from the concrete surface.
- E. Bond breaker or form release agent shall be a non-staining mineral oil or similar liquid product that imparts a waterproof film to prevent adhesion of concrete and will not leave a paint impeding coating on the face of the concrete or release agents that will not transfer to the concrete.

PART 3 EXECUTION

3.01 FAMILIARIZATION

- A. Prior to implementing any of the Work described in this Section, CONTRACTOR shall become thoroughly familiar with the Site, the site conditions, and all portions of the Work falling within this Section.
- B. Prior to implementing any of the Work in this Section, CONTRACTOR shall carefully inspect the installed Work of all other Sections and verify that all Work is complete to the point where the installation of this Section may properly commence without adverse impact.
- C. If CONTRACTOR has any concerns regarding the installed Work of other Sections, then CONTRACTOR shall notify ENGINEER in writing prior to commencing the Work. Failure to notify ENGINEER or construction of the concrete formwork will be construed as CONTRACTOR’s acceptance of the related Work of all other Sections.

3.02 CONSTRUCTION

- A. CONTRACTOR shall construct and adequately brace the formwork so that the resulting concrete surfaces will conform to the dimensions specified on the Drawings and in accordance with requirements of ACI 301.

- B. CONTRACTOR shall provide mortar tight forms of approved materials that conform to the required shapes, lines and dimensions, and will produce a smooth surface without fins and projections.

3.03 COATING

- A. CONTRACTOR shall coat the forms with bond breaker prior to the placement of reinforcing steel.
- B. CONTRACTOR shall allow excess coating material neither to stand in puddles in the forms nor to come in contact with concrete against which fresh concrete is to be placed.
- C. CONTRACTOR shall coat bolts and rods that are to be completely removed or that are to be free to move with a bond breaker.

3.04 EMBEDDED ITEMS

- A. CONTRACTOR shall thoroughly clean items to be embedded in concrete from oil or other foreign matter that would weaken the bond of the concrete to these items.

3.05 FORMWORK TOLERANCES

- A. CONTRACTOR shall construct the formwork to maintain tolerances required by ACI 301.
- B. CONTRACTOR shall install in the formwork requisite inserts, anchors, sleeves, and other items specified under other sections of these Technical Specifications. Close ends of conduits, piping, and sleeves shall be embedded in concrete with caps or plugs.
- C. Concrete pads, curbs, pedestals, and similar means devised by CONTRACTOR to support the forms will be subject to review by ENGINEER and the CQC Consultant.
- D. Before depositing concrete, the location and support of items that are to be wholly or partially embedded shall be checked by CONTRACTOR.
- E. CONTRACTOR shall provide openings and recesses and place sleeves in the concrete as may be required and furnished by other sections of these Technical Specifications.

3.06 REMOVAL OF FORMS

- A. CONTRACTOR shall maintain forms, falsework, and centering in place until the concrete has attained the minimum percentage of specified design strength to carry their own weight and any loads to which they will be subjected without exceeding the permissible stresses and without deforming.

- B. CONTRACTOR shall compute these permissible stresses on the basis of 0.6 of the compressive strength attained by the concrete at the time of removal. The concrete strength attained prior to form removal shall be determined from the results of test cylinders cured adjacent to and under the same conditions as the placed concrete. The test cylinders shall be obtained and tested in accordance with the procedures of Section 03300 (Cast-in-Place Concrete) of the Technical Specifications.

3.07 PROTECTION OF WORK

- A. CONTRACTOR shall use all means necessary to protect all Work of this Section and materials and completed Work of other sections.
- B. In the event of damage to this Work or other Work, CONTRACTOR shall immediately make all repairs and replacements if necessary, to the approval of ENGINEER and at no cost to OWNER.

[END OF SECTION]

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for the manufacture, storage, delivery, and installation of cast-in-place, steel fiber reinforced (SFR) concrete, as specified herein, and as shown on the Drawings.
- B. CONTRACTOR shall coordinate the installation of the cast-in-place SFR concrete with other construction activities and subcontractors at the Site.
- C. All Work shall be performed in accordance with ASTM C1116, ACI 318 and ACI 301.
- D. CONTRACTOR shall retain a Construction Quality Control (CQC) Consultant to perform the field and laboratory testing of cast-in-place concrete. The CQC Consultant must be acceptable to ENGINEER and OWNER.
- E. It is the intent of the design that the entire tipping floor be placed in a single, continuous pour. If this cannot be accomplished, CONTRACTOR shall be required to install embedded water stops in cold joints. Coordinate with ENGINEER regarding acceptable materials and installation procedures.

1.02 SUBMITTALS

- A. At least 14 days prior to starting the Work of this Section, CONTRACTOR shall submit to ENGINEER the proposed concrete design mix. The design mix shall present the composition of the concrete mix including:
 - 1. type of steel fiber, including ultimate tensile strength, length and aspect ratio;
 - 2. aggregate, sand, and cement content;
 - 3. types of admixtures;
 - 4. compressive strength, slump, and air entrainment
- B. At least 14 days prior to starting the Work of this Section, CONTRACTOR shall submit to ENGINEER the methods proposed for use against low and high temperatures for protection of the concrete.

- D. As soon as the data is available, CONTRACTOR shall submit to ENGINEER compression test data from compression test cylinders. Testing of compression test cylinders shall be performed by CONTRACTOR's Construction Quality Control (CQC) Consultant in accordance with ASTM C 39. Cast-in-place concrete that does not meet these Specifications shall be removed and replaced at CONTRACTOR's expense or may be subjected to a load test, also at CONTRACTOR's expense.
- E. Following installation, CONTRACTOR shall submit a placement log to ENGINEER for all cast-in-place concrete items including the following information:
 - 1. date of placement;
 - 2. location and extent of placement;
 - 3. time concrete batched and time sampled;
 - 4. water added at Site (if any);
 - 5. quantity of concrete;
 - 6. air temperature; and
 - 7. results of slump and air content testing; and
 - 8. results of laboratory compressive strength testing.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

- A. Concrete mix shall conform to ASTM C 1116, and shall be ready-mixed, normal weight, with a minimum compressive strength of 6,000 psi at 28 days.
- B. Slump shall be less than 4 in. when measured according to ASTM C 143. If concrete mix has a slump of less than 2 in., time of flow shall be measured through an inverted slump cone in accordance with ASTM C 995 instead of ASTM C 143. Time of flow shall be between 8 and 15 seconds. Concrete mix air entrainment shall be between 4 and 6 percent.
- B. Cement shall conform to ASTM C 150, Type I.
- C. Aggregate shall conform to ASTM C 33. Maximum size of coarse aggregate shall be 3/4 in.
- D. Water shall be potable.
- E. SFR content shall be 132 lb/yd³ of concrete mix. SFR shall conform to ASTM A 820. The minimum ultimate tensile strength for SFR shall be 50,000 psi. The length of

individual SFR fibers shall be in the range of 0.5 to 2.5 in. and have an aspect ratio in the range of 30 to 100.

- F. Care shall be taken to prevent SFR deterioration, exposure to moisture, or contamination by foreign materials. If SFR becomes contaminated or deteriorates, it shall not be used.

2.02 ADMIXTURES

- A. Admixtures shall be free of all chlorides.
- B. Water-reducing admixtures shall conform to ASTM C 494, Type A and shall be used in accordance with the manufacturer's recommendations. Technical assistance from the manufacturer's representative shall be provided upon request.
- C. Air-entraining admixtures shall conform to ASTM C 260 and shall be used in accordance with the manufacturer's recommendations. Testing of air-entraining admixtures shall be performed in accordance with ASTM C 233. Technical assistance from the manufacturer's representative shall be provided upon request.
- D. Other admixtures shall not be used without written acceptance by ENGINEER.

2.03 CONCRETE MIXING

- A. Concrete mixing shall conform to ASTM C 1116 and ACI 544.3R-5.
- B. SFR shall be dispersed uniformly throughout each batch of concrete. SFR concrete which is not properly batched and develops either dry balls of fibers (SFR which has not been fully mixed into the concrete) or wet balls of fiber (SFR clumps mixed within a nominal cement matrix) shall be rejected.
- C. Mix proportions for all concrete, unless otherwise specified, shall be selected preferably on the basis of field experience. In the case where sufficient or suitable strength test data is not available, concrete shall be proportioned on the basis of laboratory trial mix design.
- C. The concrete shall have adequate workability and proper consistency to allow it to be readily worked into the forms and around reinforcement without excessive segregation or bleeding.
- D. Ready Mix Concrete shall comply with the requirements of ASTM C 94 for mixing time and water addition. Total mixing time for concrete shall be determined in accordance with ASTM C 94 for the type of mixing equipment used.

- E. Concrete that has been in a truck for more than 1½ hours after addition of water, or had more than 300 revolutions, or concrete that has become hard or non-plastic, shall not be used and shall be rejected by ENGINEER.
- G. Concrete that has been in a truck for more than 1½ hours from batch plant to placement shall not be used and shall be rejected by ENGINEER.
- H. When concrete arrives at the Site having a slump below that specified herein, water may be added only if neither the maximum specified water/cement ratio nor the maximum specified slump is exceeded. At no time shall more than 10 gallons of water be added to any one truckload. The additional water should be incorporated into the mix by increasing the mixing time at least 1½ times the total mixing time required by ASTM C 94. However, CONTRACTOR shall bear total responsibility for the effects of adding water on the quality and strength of the concrete.
- I. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

PART 3 EXECUTION

3.01 FAMILIARIZATION

- A. Prior to implementing any of the Work described in this Section, CONTRACTOR shall become thoroughly familiar with all portions of the Work falling within this Section.
- B. Prior to implementing any of the Work in this Section, CONTRACTOR shall carefully inspect the installed Work for all other sections and verify that all Work is complete to the point that the installation of this Section may properly commence without adverse impact.

3.02 EXAMINATION AND PREPARATION

- A. ENGINEER shall examine formwork, sleeves, and joint materials prior to placement of concrete. Defective material shall be removed and replaced with new material at no cost to OWNER.
- B. CONTRACTOR shall clean all formwork and structural excavations of foreign matter, debris, loose material, and water.
- C. ENGINEER shall be notified at least two working days in advance of a scheduled delivery to allow time for adequate observation of the Site.

3.03 PLACING CONCRETE

- A. Concrete shall not be placed until the forms and other conditions are approved by ENGINEER.
- B. Water shall be removed from the space to be occupied by concrete, and any continuous flows of water shall be diverted to a sump or removed by pumping.
- C. Concrete placement practices shall comply with ACI 1116 and ACI 544.3R-6.
 - 1. Concrete shall be conveyed from the mixer to the place of final deposit by methods that will prevent segregation or loss of materials.
 - 2. Aluminum conveying equipment shall not be used.
 - 3. Conveying equipment shall be capable of providing a supply of concrete at the placement site without interruptions sufficient to permit loss of plasticity between successive increments.
 - 4. Concrete shall be placed as near as practicable to its final position to avoid segregation due to re-handling or flowing.
 - 5. Concrete placement shall be performed at such a rate that the concrete is plastic at all times and readily flows into the forms.
 - 6. Concrete placement shall be performed at such a rate to assure that lifts below have not taken initial set before fresh concrete is placed.
 - 7. Concrete that has partially set shall not be re-tempered; it shall be discarded.
 - 8. No concrete that has hardened or has been contaminated by foreign materials shall be placed, nor shall re-tempered concrete or concrete that has been re-mixed after initial set be used, unless approved by ENGINEER.
- D. Concrete shall be consolidated by internal mechanical vibrating equipment in accordance with ACI 544.3R-6 during and immediately after placement. Consolidation by other means (e.g., hand rodding, etc.) is not permitted
- E. SFR concrete typically appears stiff compared to plain concrete. CONTRACTOR shall not add water to the concrete mixture to improve workability when placing SFR concrete.
- F. In the event of rain during concrete placement, the placement shall be terminated as soon as practicable at a point approved by ENGINEER and freshly placed concrete shall be protected with a waterproof covering that shall prevent marring or damage of surfaces.
- G. Concrete shall not be placed without consent of ENGINEER when the temperature is 50°F or less, or when there is reason to expect a drop in temperature to below 50°F within 12 hours of the conclusion of the pour. Concrete placed at air temperature below 40°F shall have a minimum temperature of 60°F. When the air temperature is below

40°F or near 40°F and falling, the water and aggregates shall be heated before mixing. Accelerating chemicals shall not be used to prevent freezing.

- H. Hot weather placement of concrete shall comply with ACI 305R.
- I. Cold weather placement of concrete shall comply with ACI 306R.

3.04 CONCRETE CURING

- A. Freshly placed concrete shall be protected from premature drying and excessive cold or hot temperatures.
- B. Curing procedures shall begin immediately after placement in accordance with ACI 308 procedures to provide continuous moist curing above 50°F for at least seven (7) days.
- C. Curing of concrete shall be performed by moist curing and by moisture retaining cover curing, as herein specified. Moisture curing shall be provided by one of the following methods: covering with water, sprinkling with water, continuous water fog spray, and covering concrete surface with specified absorptive cover, thoroughly saturating cover with water, and keeping continuously wet. No salt, manure, or other chemicals shall be used for protection.

3.05 FINISH AND JOINT SEALANT

- A. The concrete slab shall initially be struck off with a vibrating metal screed. Afterwards, a metal float shall be used to obtain a reasonably smooth surface. CONTRACTOR shall take care not to overwork the surface. No further finishing is required.
- B. Epoxy Joint Filler for saw-cut joints and slab joints shall be two compound, 100 percent solids compound. "Euco 700" by the Euclid Chemical company, "Sikadur 51SL" by Sika Corporation, or approved equal. Apply joint filler only after concrete has cured a minimum of 14 days. Install epoxy joint filler for the full depth of the saw-cut joint and full depth of the interface of the concrete pad with the pavement or structure of the slab joint.

3.06 PROTECTION OF COMPLETED WORK

- A. Concrete shall be protected from damaging mechanical disturbances, water flow, loading, shock, and vibration during the entire curing period.
- B. Concrete surfaces shall be kept free from all foot and vehicular traffic and all other sources of abrasion for not less than 72 hours after finishing.

- C. Any protective coverings shall be maintained continuously during entire curing period, and damage to coverings shall be repaired immediately at no additional expense to OWNER.
- D. Finished surfaces and slabs shall be protected from the direct rays of the sun to prevent checking and crazing.

3.07 REPAIRS

- A. Repair of rock pockets, honeycombs, and sand streaks shall be accomplished by:
 - 1. cutting and removing concrete to at least 1-in. deep with sides perpendicular to surface;
 - 2. flushing with clean water;
 - 3. coating with neat cement paste;
 - 4. filling with cement drypack mix;
 - 5. curing as specified for concrete; and
 - 6. grinding smooth and flush with adjacent surfaces.

3.08 FIELD QUALITY CONTROL

- A. CONTRACTOR's CQC Consultant shall perform tests and submit test reports as defined in this Section.
- B. CONTRACTOR's CQC Consultant shall be currently accredited by one or more of the following:
 - 1. Concrete Materials Engineering Council; and
 - 2. other accreditation authority of equivalent standing to the above, on the basis of its compliance with the requirements of ASTM C 1077.
- C. Sampling fresh concrete shall be performed in accordance with ASTM C 172, except modified for slump to comply with ASTM C 94:
 - 1. Slump test according to ASTM C 143 (or time of flow per ASTM C 995 as appropriate) and air content test according to ASTM C 231 shall be measured as follows:
 - a. one test at point of discharge for each set of compression cylinders taken;
 - b. additional tests when concrete consistency appears to have changed; and
 - c. one test on each truck load of concrete delivered to the site.
 - 2. Molded concrete compression cylinders shall be sampled in accordance with ASTM C 172, processed and cured in accordance with ASTM C 31, and prepared and tested in accordance with ASTM C 39:

- a. one set of six cylinders shall be obtained for each 50 cubic yards, or fraction thereof, for each day's placement of each mix design;
 - b. two cylinders shall be tested at seven (7) days and two cylinders for one valid strength test at 28 days; and
 - c. The last two cylinders shall be cured and held for testing at 42 days if the 28-day test indicated deficient results, or as a spare in case of cylinder damage.
- D. If sampling of fresh concrete for slump, time of flow, or air entrainment fall outside the limits specified under Part 2.01B of this Section, CONTRACTOR's CQC Consultant shall immediately test another portion of the same sample. If the results fall outside the limits specified herein again, then the sample fails and the concrete will be rejected.

3.09 PRODUCT PROTECTION

- A. CONTRACTOR shall use all means necessary to protect all prior Work, including all materials and completed Work of other Sections.
- B. In the event of damage to prior Work or Work specified in this Section, CONTRACTOR shall immediately make all repairs and replacements necessary to the approval of OWNER or ENGINEER and at no cost to OWNER.

[END OF SECTION]