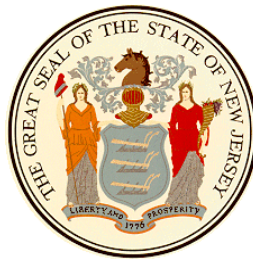


SPECIFICATION

New Jersey Department of Transportation Hamilton Maintenance Yard Blend Boss Installation

2779 Kuser Road
Hamilton, Mercer County, New Jersey
DPMC Project No. T0553-07

STATE OF NEW JERSEY
Honorable Chris Christie, Governor
Honorable Kim Guadagno, Lieutenant Governor



DEPARTMENT OF THE TREASURY
Ford M. Scudder, State Treasurer

DEPARTMENT OF TRANSPORTATION
Richard T. Hammer, Acting Commissioner



Gannett Fleming
5 Eves Dr., Suite 200, Marlton, New Jersey 08053

Permit Submission

Date: December 30, 2016

Teresa L. Peterson
NJ PE #24GE04558200

NJDOT Project Reference Number: (T0543-03)

Project: NJDOT Hamilton Maintenance Yard Blend Boss Installation

Project Site: 2779 Kuser Road
Hamilton, Mercer County, New Jersey

Important Dates:

- **Mandatory Site Visit:** Wednesday, February 15, 2017 @ 10:00AM
- **Question Cut-Off:** Wednesday, February 22, 2017 @ 10:00 AM
- **Answers to Bid Questions:** Bidders are encouraged to monitor the website daily for updates, changes and responses to questions through the submission due date.
- **Bid Opening:** Wednesday, March 1, 2017, 2017 @ 10:00 AM

Procurement Contact: Kesha Cox (609) 530-2412
[dot-ems bid.procurement@dot.nj.gov](mailto:dot-ems_bid.procurement@dot.nj.gov)

Project Manager: Christopher Sagliocco (609) 530-3883

Section 00 00 10 – Table of Contents

SPECIFICATION NUMBER	SPECIFICATION DESCRIPTION	PAGES
	Division 01 – General Requirements	
01 10 00	Summary of Work	01 10 00 1-2
01 14 00	Building Security and Contractor Use of the Premises	01 14 00 1-8
01 20 00	Alteration Project Procedures	01 20 11 1-4
01 31 00	Project Management and Coordination	01 31 00 1-8
01 32 16	Construction Progress Documentation	01 32 16 1-8
01 33 00	Submittals	01 33 00 1-4
01 45 00	Cutting and Patching	01 45 00 1-4
01 66 00	Product Storage and Handling Requirements	01 66 00 1-4
01 70 00	Project Record Documents	01 70 00 1-4
01 77 00	Closeout Procedures	01 77 00 1-4
01 78 20	Operation and Maintenance Data	01 78 20 1-6
	Division 02 – Existing Conditions	
02 41 19	Selective Demolition	02 41 19 1-4
	Division 07 – Thermal and Moisture Protection	
07 84 00	Firestopping	07 84 00 1-4
	Division 31 – Earthwork	
31 23 33	Trenching and Backfilling	31 23 33 1-12
	Division 32 – Exterior Improvements	
32 10 00	Bases, Ballasts and Pavements	32 10 00 1-16

Section 00 00 10 – Table of Contents

INDEX OF SHEETS		
SHEET NO.	DWG. NO.	DESCRIPTION
1	T-01	COVER SHEET, INDEX, PROJECT LOCATION
2	C-01	CIVIL SITE PLAN
3	C-02	CML DETAILS
4	E-00	GENERAL NOTES, SYMBOLS, ABBREVIATIONS & SPECIFICATIONS
5	E-01	ELECTRICAL SITE PLAN NEW WORK
6	E-02	ELECTRICAL EQUIPMENT ELEVATION PLAN AND DETAILS
7	E-03	SINGLE LINE DIAGRAM

END OF SECTION

SECTION 01 10 00 - SUMMARY OF WORK

PART 1 GENERAL

- A. The Project scope consists of installing a new concrete pad to support one brine mixer system, bollards, and associated electrical improvements to provide power for the brine mixing system.
 - 1. Project Location: 2779 Kuser Rd., Hamilton, Sussex County, NJ.
 - 2. Owner: State of New Jersey.
 - 3. Owner's representative: Department of Transportation.
- B. Permit Documents, will be prepared for the Project by Gannett Fleming, Incorporated, located at 5 Eves Drive, Suite 200, Marlton, New Jersey.
- C. All areas of work are located within the Hamilton Maintenance Yard located at 2779 Kuser Rd., Morris, Sussex County, NJ..
- D. The construction period is forty-five (30) business days.
- E. The Scope of Work at the Hamilton Maintenance Yard includes installing a new concrete pad to support one brine mixer system, bollards, and associated electrical improvements to provide power for the brine mixing system.
- F. Phasing of Work: Contractor shall plan to work within an active maintenance facility during normal work hours and as such, shall plan his work for minimum disruption of the facility's activities.
- G. Contractor Use of Premises: Refer to Specification Section 01 14 00 for information on the contractor use of premises.
- H. Use of the Site: Limit use of premises to areas indicated. Do not disturb portions of the site beyond the areas indicated.
 - 1. Allow for Owner occupancy.
 - 2. Keep driveways and entrances clear. Do not use these areas for parking or material storage. Schedule deliveries to minimize on-site storage of materials and equipment.
- I. Use of the Existing Building: Protect the existing building and its occupants during construction.
- J. Full Owner Occupancy: The Owner will occupy the site during construction activities. Cooperate with the Owner to minimize conflicts and facilitate Owner usage. Do not interfere with the Owner's operations.
- K. Contractor is to provide all required temporary construction to segregate the work area from the existing operations.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 14 00 – BUILDING SECURITY AND CONTRACTOR USE OF THE PREMISES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawing and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 USE OF PREMISES

- A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
 - 1. Hamilton Maintenance Facility: Allow for all of the normal functions and security procedures of the building.
 - 2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to the Building Visitors, Employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.
- C. Use of Building Schedule:
 - 1. Coordinate with facility.
- D. For any change of use of building schedule, coordination with the facility is required.

1.3 OCCUPANCY REQUIREMENTS

- A. Full Occupancy: The facility will occupy site during entire construction period. Cooperate with the State during construction operations to minimize conflicts and facilitate the facility usage. Perform the Work so as not to interfere with the facility's operations.
- B. The following items describe the allowed use of the Maintenance Yard and grounds by the contractor, the availability of utilities, contractor equipment storage regulations, noise and odor restrictions, security issues, parking restrictions, material deliveries, working hours, and protection of interior finishes. This list shall not be considered all-inclusive and may be extended by the Construction Manager or DOT.
 - 1. Coordination, site access, parking, deliveries and storage
 - 2. Availability and use of utilities
 - 3. Contractor work areas, working conditions, and equipment storage regulations

4. Noise and odor restrictions, material approvals, and working hours
5. Security issues
6. Protection of interior finishes

1.4 GENERAL REQUIREMENTS

- A. The contractor shall provide a verbal daily progress report to the building manager and Building Security identifying the construction work to be performed that day.
- B. It should be noted that other projects may be in progress concurrently with this project within the area. Site access, deliveries, traffic control, parking, heavy equipment parking, material storage and trailer locations must be coordinated with the DOT Project Manager, Building Security, and Building Manager.
- C. The building's tenants must have free and safe access to, from, and within the maintenance facility at all times.
- D. When workers are finished for the day, all tools will be accounted for by the contractor.
- E. Workers once entering controlled areas are not permitted to wander from the work area. Should a worker need to go to another area, he/she will be escorted by a staff member.
- F. Should work required more than one day to complete the job, permission to construct and use temporary storage facilities is solely at the discretion of the facility authorities. The facility will not accept responsibility for any loss or damage to materials left on site. All tools and equipment should be removed daily.
- G. Anything of unusual nature such as loss of key, identification cards, tools, piping, etc., shall be reported immediately to the program superintendent.
- H. In the event that construction requires the disruption of plumbing, electrical power, etc., the program superintendent must receive at least twenty-four (24) hours advance notice in order to preserve security and not to disrupt routine activities. When temporary shutdown of service is unavoidable, the work shall be completed at night during a time when the facility's routine will not be disrupted.
- I. Workers shall be subjected to all rules and regulation and shall comply with staff members' instructions accordingly.

1.5 AVAILABILITY AND USE OF UTILITIES

- A. Electric and water are available at the site. The Building Manager and DOT Project Manager will approve, in advance, specific usage.

1.6 NOISE AND ODOR RESTRICTIONS, MATERIAL APPROVALS AND WORKING HOURS

- A. For the purposes of this project, regular working hours shall be from 7:00 am to 3:30 pm weekdays.
 - 1. All work conducted within public areas, or which are likely to generate noise or odor complaints must be performed outside of regular hours. See “B” below.
 - 2. For work which may generate complaints, the contractor may work between the hours of 6pm to 6am on weekdays.
 - 3. Any requests by the contractor to work outside of the regular working hours shall be made at least twenty-four (24) hours in advance and shall be subject to approval by the Engineer, DOT Project Manager, Building Manager, and State Police. If granted, the contractor must observe the conditions of “B” and “C” below.
- B. Consideration shall be given by the contractor regarding odors, adhesives, noise, etc. If the odors or noise are such that they may disturb the building tenants and/or public in any way, then such work shall be performed while the building is not occupied. This determination shall be at the sole discretion of the DOT Project Manager.
- C. If construction work is performed adjacent to other State offices in full and continuous use during the course of the project, then the contractor shall coordinate all operations with the DOT Project Manager and Building Manager to minimize disturbances to the occupants of these offices. The playing of radios and other unnecessary noise will not be permitted.
- D. All material safety data sheets shall be submitted and approved by the DOT Project Manager or his/her designee, prior to use of the material.

1.7 CONTRACTOR WORK AREAS, WORKING CONDITIONS, AND EQUIPMENT STORAGE REGULATIONS

- A. The contractor shall adequately secure and protect its equipment, materials, and vehicles. The State assumes no liability for any damage to, or theft of, the contractor’s property. The contractor shall have the use of a designated area for storage and staging of construction materials and equipment. Items stored in this area shall be screened from view by the public. The contractor shall install a six (6) foot high fence with screening material to surround the area. The location of the area, type of fence, and screening material to be used shall be approved by the Engineer, DOT Project Manager, the Building Manager, and the Building Security. The contractor shall be responsible for adhering to security procedures outlined by the Building Manager and the Building Security.
- B. The contractor shall strictly limit its employees’ use of the facilities for lunch, smoking, or rest time usage to only those areas designated by the Building Manager. Use of State telephones will not be allowed. Use of toilet facilities within the building will not be permitted. Smoking is not allowed inside any of the buildings within the Maintenance Yard.
- C. The contractor shall, at all times, enforce strict discipline and good order among its employees and shall not employ any unfit person or any non-skilled person in

the task assigned to him. The contractor shall supervise and direct the work using its best skill and attention.

The contractor shall employ a competent, full-time supervisor to appropriately supervise the work and protect people and the facilities. The contractor must maintain a person on the site who represents the firm and can make immediate decisions when required.

- D. The contractor agrees that upon request by the DOT Project Manager, it will remove from services hereunder, any of its employees who are incompetent, prone to tardiness, absenteeism or theft, are improper in conduct, or are not qualified or needed to perform the work assigned.
- E. The Construction Management Team in cooperation with the contractor, DOT, State Police, and Building Management representatives, shall develop a "Project Directory" which identifies key designated representatives who may make decisions. Office telephone and cell phone numbers must be identified for immediate problem resolution.
- F. If a construction dumpster is used by the contractor, it shall be placed in a location approved by the Building Manager, DOT Project Manager, and State Police. Any dumpster shall be properly secured during the project and promptly removed at the end of the project and emptied regularly so as to not allow trash to be strewn about the grounds or to cause odors.

1.8 SPECIAL REQUIREMENTS AND PROTECTION OF INTERIOR FINISHES

- A. Materials shall be moved through the building using rubber tired vehicles which shall be properly controlled at all times to avoid damage to existing walls, floors and ceiling surfaces, including doors and door and/or window frames.
- B. Water damage will not be tolerated and it is incumbent upon the contractor to take all steps to keep the existing premises dry at all times.
- C. All welding and cutting shall be performed by qualified and certified welders. Certificates shall be on the file with the Engineer and Owner prior to commencement of any welding.
- D. Existing streets, pavements, lawns, curbs and other finished surfaces disturbed or damaged by excavation or other construction activities shall be repaired and restored to their original conditions to the satisfaction of the Owner, Engineer and local authorities.
- E. The contractor shall take care to avoid damage or soiling to any part of the facility. The contractor is responsible for all damages or destruction caused directly or indirectly by its performance to any part of the building or adjoining property. Any damage or destruction caused by the contractor or its employees will be repaired as directed by the Building Manager and DOT Project Manager, to the satisfaction of the same, with all costs charged to the contractor. The costs of such work may be deducted from any and all amounts due to the contractor.

- F. The contractor shall take care to avoid damage or soiling to any part of the building or its finishes. Any of the contractor's employees found defacing, damaging, or marring the building or its finishes shall be immediately removed by the contractor. The contractor shall be charged for all remedial work to restore the damaged area to its original condition to the satisfaction of the State.
- G. The contractor shall take all necessary steps to ensure adequate protection of all building furniture, equipment and building finishes, including but not limited to: floors, walls, windows, draperies, blinds, fan coil unit millwork, carpeting, doors and doorways. In this endeavor, all workers shall take precautions to protect rugs and floors. The contractor shall be charged for all remedial work to clean, repair and/or replace items damaged by the contractor to the satisfaction of the State.
- H. The contractor is responsible for the cost of cleanup of dust, dirt and stains caused by the work to the satisfaction of the Building Manager and DOT Project Manager. The contractor shall take all necessary precautions to keep dust, dirt, and debris to a minimum within the construction area.

1.9 SITE SECURITY

- A. The contractor and his/her employees are subject to a security clearance by the Building Security.
- B. The following regulations must be observed by all persons having any association with the construction of this project (employees, subcontractors, workmen, servicemen, manufacturer's representatives, etc.):
 - 1. Assigning Men to the Site
 - a. Each trade subcontractor shall notify the program superintendent twenty-four (24) hours in advance, but no later than 12:00 noon, on the previous work day before sending men to the project site, so a staff member can be assigned to accompany all his personnel.
 - 2. Tools and Materials
 - a. No tools or materials shall be left unguarded at any time, and they shall be removed from the working areas at the end of each working day or at anytime the workmen leave the area unlocked.
 - 3. Prison Records
 - a. Where a workmen or representative visiting the facility has a prison record, the trade subcontractor shall be responsible for obtaining the particulars concerning his record, and notifying the facility at least twenty-four (24) hours in advance of his visit. The facility will then notify the trade subcontractor and give or deny permission for that person to enter the facility. Any workman denied entrance to the facility must be replaced by the trade subcontractor or subcontractor at no additional cost.
 - 4. Searches
 - a. All workmen will be expected to submit to search of themselves, their tool boxes, lunch containers, and/or their vehicles at any time, if the search is deemed necessary.
 - 5. Prohibited Items
 - a. The following items are prohibited from being brought onto the facility grounds and construction site:

1. Alcoholic beverages and drugs.
2. Explosives and firearms.
6. Working Dress and Workmen
 - a. Workmen will maintain proper attire while working at the facility. No shorts are allowed to be worn in the work areas.
7. You are not authorized to roam at will throughout the facility. You will restrict yourself to going directly to those places where your work is conducted and remaining away from all areas where you have no business.
8. Your automobile is to be parked in the main parking lot designated by the program superintendent. Parked vehicles must always have the ignition locked and if the interior of the car contains packages, clothing, or any other removable articles, the door must be locked as well. Key's will be required to be turned in to desk officer until departing unit except for vehicles needed on the job site.
9. No photography may be taken without proper authorization. No public news releases may be given without similar authorization.
10. You are not authorized to escort any person, not previously approved, onto the facility grounds or into the facility.
11. The use of indecent, abusive or profane language is forbidden anywhere on the facility's property.
12. Tools and Equipment Safety
 - a. Flammable Liquids: Maintain flammable liquid (e.g., gasoline, fuels, etc.) in secure containers at all times, in compliance with OSHA regulations.
 - b. Tools: Maintain tools and related equipment (e.g., hack saw blades, etc.) in secure locations acceptable to the program superintendent.
 - c. Powder Actuated Tools: Comply with manufacturers and Program Superintendents directions for control of powder used and stored.
13. Construction Personnel Vehicle Parking
 - a. Parking spaces for privately owned vehicles operated by construction personnel may be limited.
 - b. The program superintendent at the facility will assign areas within the facility site for parking. Sufficient space will be provided to park privately owned vehicles operated by construction personnel on site. Vehicles to remain parked in the main lot will be required to turn in keys to desk officer.
 - c. Vehicle inspections may be conducted at discretion of the program superintendent for the duration of the project.
14. Smoking should only be done in the designated smoking area. Cigarette butts must be disposed of properly (stripped and discarded in trash can). Cigarettes, lighters or matches should be kept on person at all times.

1.10 FIRE PROTECTION

- A. Protect and maintain fire department facilities (e.g., sprinkler heads, hydrants, wires, cables, ducts, manholes, posts, poles, signals, alarm boxes, etc.) at all times.
- B. Maintain unobstructed access to the following at all times: Fire hydrants and fire alarm boxes.

- C. Immediately notify the Fire Department in the event of accidental damage to fire department facilities.
- D. Immediately restore damaged facilities to original condition at no increase to Contract Sum.
 - 1. Restoration: Approved by Fire Department authorized representative.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

I have read and understood the security procedures described in this section.

_____ Signature	_____ Representing	_____ Date
_____ Signature	_____ Representing	_____ Date
_____ Signature	_____ Representing	_____ Date
_____ Signature	_____ Representing	_____ Date
_____ Signature	_____ Representing	_____ Date
_____ Signature	_____ Representing	_____ Date

END OF SECTION

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SECTION 01 20 00 - ALTERATION PROJECT PROCEDURES

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Products and installation for patching and extending work.
- B. Transition and adjustments.
- C. Repair of damaged surfaces, finishes and cleaning.

1.2 SUBMITTALS

- A. Comply with pertinent provisions of the specifications
- B. Product Data:
 - 1. Within ten (10) calendar days after Contractor has received the State's Notice to Proceed, submit:
 - a. Materials list of items proposed to be provided under this section.
 - b. Manufacturer's specifications and other data, needed to prove compliance with the specified requirements.

PART 2 PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Material: As specified in product sections, match existing projects and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing work as a standard

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that demolition is complete and areas are ready for installation of new work; advise Engineer when ready to commence.
- B. Beginning of restoration work means acceptance of existing conditions.

3.2 PREPARATION

- A. Cut, move or remove items, as necessary for access to alterations and renovation work; replace and restore at completion.
- B. As soon as possible, remove from site demolished and unsuitable materials, such as rotted wood, corroded metal, deteriorated masonry and concrete; items

marked for salvage or reuse are to be stored and protected from damage or turned over to the State, when so requested; replace materials, as specified for finished work.

- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.
- E. Close opening in building envelope to protect existing interior and new work from weather and extremes of temperature and humidity and to prevent unauthorized entrance to the area; insulate ductwork and piping to prevent condensation in exposed areas; heat areas to prevent freezing of building system and all new work.

3.3 INSTALLATION

- A. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
- B. In addition to specified replacement of equipment and fixtures; restore existing plumbing, heating, ventilation and electrical systems to full operational condition.
- C. Install products as specified in individual sections.

3.4 TRANSITIONS

- A. Where new work abuts or aligns with existing, perform a smooth and even transition; patch work to match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to engineer.

3.5 ADJUSTMENTS

- A. Where removal of partitions or walls results in adjacent spaces becoming one; rework floors, walls and ceiling to a smooth plane without breaks, steps or bulkheads.
- B. Where a change of plane or one-quarter inch (1/4") or more occurs, submit recommendation for providing a smooth transition for Engineer's review.

3.6 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces that are damaged, lifted, discolored or showing other imperfections.
- B. Repair substrate prior to patching finish.

3.7 FINISHES

- A. Finish surfaces, as specified in individual product sections.
- B. Finish patches to product uniform finish and texture over entire area; when finish cannot be matched, refinish entire surface to nearest intersections.

3.8 CLEANING

- A. Clean all work (contract) areas of the building.

END OF SECTION

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SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination Drawings.
 - 2. Administrative and supervisory personnel
 - 3. Project meetings.
 - 4. 1 week look ahead schedule
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.
- C. Related Sections include the following:
 - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.

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. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection and operation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. General Contractor shall coordinate operations of each of the sub-contractors and other entities, included in different Sections that depend on each other for proper installation, connection and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
 - 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service and repair of all components, including mechanical and electrical.
 - 5. Fully coordinated drawings of each door location are to be issued to the A/E for review before the construction of the door begins.

- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports and list of attendees at meetings.
 - 1. Prepare similar memoranda for the State and separate contractors if coordination of their Work is required.

- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's Construction Schedule.
 - 2. Preparation of the Schedule of Values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. 2 week look ahead schedule
 - 7. Pre-installation conferences
 - 8. Project closeout activities
 - 9. Startup and adjustment of systems
 - 10. Project closeout activities.

- E. 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. Refer to other Sections for disposition of salvaged materials that are designated as the State's property.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated or manufactured by separate entities.
 - 1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
 - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical and electrical systems.
 - b. Indicate required installation sequences.
 - c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Engineer for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
 - 2. Sheet Size: At least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
 - 3. Number of Copies: Submit 6 opaque copies of each submittal. Engineer will return 5 copies of distribution to DOT representative, Agency representative, contractor, subcontractor.

- a. Submit 6 copies where Coordination Drawings are required for operation and maintenance manuals. Engineer will retain one copy; remainder will be returned for distribution to DOT representative, Agency representative, contractor, subcontractor.
 4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.
- B. Key Personnel Names: Within 10 calendar days of notice to proceed, submit a list of key personnel assignments, including superintendent fluent in English and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
1. Post copies of list of key personnel as well as Department of Transportation, Security Department Personnel and State Police in Project meeting room, in temporary field office and by each temporary telephone. Keep list current at all times.

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.
1. Include special personnel required for coordination of operations with other contractors.

1.6 PROJECT MEETINGS

- A. General: Attend all meetings and conferences at Project site overseen by DOT, unless otherwise indicated.
1. Attendees: Inform sub-contractors, key personnel and others involved and individuals whose presence is required, of date and time of each meeting.
- B. Preconstruction Conference: DOT Construction Manager shall schedule a preconstruction conference before starting construction no later than 10 days after notice to proceed. The conference shall be at Project site or another convenient location.
1. Attendees: Authorized representatives of DOT, Engineer and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. 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. Tentative construction schedule
 - b. 2 week look ahead schedule
 - c. Critical work sequencing and long-lead items
 - d. Designation of key personnel and their duties
 - e. Procedures for processing field decisions and Change Orders
 - f. Procedures for requests for interpretations (RFIs)

- g. Procedures for testing and inspecting
 - h. Procedures for processing Applications for Payment
 - i. Distribution of the Contract Documents
 - j. Submittal procedures
 - k. Preparation of Record documents
 - l. Use of the premises and existing building
 - m. Work restrictions
 - n. Responsibility for temporary facilities and controls
 - o. Construction waste management and recycling
 - p. Parking availability
 - q. Office, work and storage areas
 - r. Equipment deliveries and priorities
 - s. First aid
 - t. Security
 - u. Progress cleaning
 - v. Working hours
 - w. Close Out Procedures
3. Minutes: Engineer will record and distribute meeting minutes.
- C. Pre-installation Conferences: Attend Pre-installation conference at Project site before each construction activity that requires coordination with other construction and as specified elsewhere within these specifications.
1. Attendees: Installer and representative of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting, along with Engineer, DPMC, Construction Manager and client representative.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. The Contract Documents
 - b. Options
 - c. Related requests for interpretations (RFIs)
 - d. Related Change Orders
 - e. Purchases
 - f. Deliveries
 - g. Submittals
 - h. Review of mockups
 - i. Possible conflicts
 - j. Compatibility problems
 - k. Time schedules
 - l. Weather limitations
 - m. Manufacturer's written recommendations
 - n. Warranty requirements
 - o. Compatibility of materials
 - p. Acceptability of substrates
 - q. Temporary facilities and controls
 - r. Space and access limitations
 - s. Regulations of authorities having jurisdiction
 - t. Testing and inspecting requirements

- u. Installation procedures
 - v. Coordination with other work
 - w. Required performance results
 - x. Protection of adjacent work
 - y. Protection of construction and personnel
3. Engineer shall record significant conference discussions, agreements and disagreements, including required corrective measures and actions.
 4. Reporting: Engineer shall distribute minutes of the meeting within 5 days of meeting to each party present and to parties who should have been present.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: DOT Construction Manager shall conduct progress meetings at biweekly intervals. Contractor shall coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to client representative and Engineer, each contractor, subcontractor, supplier and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress of the work since the last meeting as per the previous 1 week look ahead schedule provided by the contractor. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed with the Contract Time.
 - 1) Review schedule of work for the next two weeks (1 week look ahead).
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements
 - 2) Sequence of operations
 - 3) Status of submittals, including shop drawings
 - 4) Deliveries
 - 5) Off-site fabrication
 - 6) Access
 - 7) Site utilization
 - 8) Temporary facilities and controls
 - 9) Work hours
 - 10) Hazards and risks
 - 11) Progress cleaning
 - 12) Quality and work standards
 - 13) Status of correction of deficient items
 - 14) Field observations

- 15) Requests for interpretations (RFIs)
 - 16) Status of proposal requests
 - 17) Pending changes
 - 18) Status of Change Orders
 - 19) Pending claims and disputes
 - 20) Documentation of information for payment requests
3. Minutes: Engineer will record the meeting minutes. The format to be used for the minutes shall comply with those identified in the "Procedures for Architects and Engineers Manual", Section 10.3.4, entitled "Format for Minutes".
 4. Reporting: Engineer shall distribute minutes of the meeting to each party present and to parties who should have been present within 5 days of meeting.
 - a. Schedule Updating: The Engineer, with input from the DOT Construction Manager and client representative shall review Contractor's Construction Schedule and 2 week look ahead schedule after each progress meeting where revisions to the schedule have been made or recognized. Contractor shall revise schedule as directed by DOT Construction Manager and resubmit to the Engineer in time to issue meeting minutes. Issue revised schedule concurrently with the minutes of each meeting.
- E. Coordination Meetings: DOT Construction Manager shall conduct Project coordination meetings at as required intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and Pre-installation conferences.
1. Attendees: In addition to DPMC Project Manager, client representative and Engineer, each contractor, subcontractor, supplier and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Combined Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed with the Contract Time.
 - b. Schedule Updating: Revise Combined Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with minutes of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements
 - 2) Sequence of operations

- 3) Status of submittals
 - 4) Deliveries
 - 5) Off-site fabrication
 - 6) Access
 - 7) Site utilization
 - 8) Temporary facilities and controls
 - 9) Work hours
 - 10) Hazards and risks
 - 11) Progress cleaning
 - 12) Quality and work standards
 - 13) Change Orders
3. Reporting: Engineer shall record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 32 16 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Preliminary Construction Schedule
 - 2. Contractor's Combined Construction Schedule
 - 3. 1 Week look ahead schedule
 - 4. Substitutions request
 - 5. Submittals Schedule
 - 6. Daily construction reports
 - 7. Material location reports
 - 8. Field condition reports
 - 9. Special reports
- B. Related Sections include the following:
 - 1. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 2. Division 01 Section "Submittals" for submitting schedules and reports.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Engineer.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either The State or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Fragment: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- H. Major Area: A story of construction, a separate building, or a similar significant construction element.
- I. Milestone: A key or critical point in time for reference or measurement.
- J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.
- K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

- A. Submittals Schedule: Submit 6 copies of schedule, one each for distribution to DPMC Construction Manager, client representative, Engineer and contractors. Submittal schedule shall be submitted no later than 10 days from Notice to Proceed. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal
 - 2. Specification Section number and title
 - 3. Submittal category (action or informational)
 - 4. Name of subcontractor
 - 5. Description of the Work covered
 - 6. Scheduled date for Engineer's final release or approval
- B. Substitutions: Submit requests for substitutions in accordance with all requirements in General Conditions.
 - 1. Substitution requests shall be submitted no later than 5 days from Notice to Proceed.
- C. Preliminary Network Diagram: Submit 6 opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.

- D. Contractor's Construction Schedule: Submit 6 opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
- E. Daily Construction Reports: Submit 6 copies at weekly intervals.
- F. Material Location Reports: Submit 6 copies at weekly intervals.
- G. Field Condition Reports: Submit 6 copies at time of discovery of differing conditions.
- H. Special Reports: Submit 6 copies at time of unusual event.

1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from contractors, vendors or other responsible parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values and Contractor's Construction Schedule.
 - 2. Initial Submittal: Submit schedule within 10 days of Notice to Proceed, concurrently with preliminary network diagram. Include submittals required during the first 15 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacturer or fabrication.
 - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Contractor shall comply with all procedures outlined in the General Conditions for preparing, revising, updating and issuing the construction schedule.
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by the DOT Construction Manager.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Engineer.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 25 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication and delivery.
 - a. Doors
 - b. Any other item identified by contractor
 - 3. Submittal Review Time: Include review and re-submittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 - 4. Startup and Testing Time: Include not less than 10 days for startup and testing.
 - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
 - 1. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued service.
 - c. Partial occupancy before Substantial Completion.
 - d. Use of premises restrictions.
 - e. Provisions for future construction.
 - f. Seasonal variations.
 - g. Environmental control.
 - 2. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards
 - b. Submittals
 - c. Purchases
 - d. Start of Construction
 - e. Deliveries

- f. Installation
 - g. Tests and inspections
 - h. Adjusting
 - i. Curing
 - j. Startup and placement into final use and operation
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion and Final Completion.
- F. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
- 1. Refer to Article 10 of the General Conditions for cost reporting and payment procedures.
- G. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 10 days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first work day of each week with a continuous vertical line.

2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
- 1. List of subcontractors listing each worker and trade at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Count of personnel at Project site.
 - 4. Equipment at Project site.
 - 5. Material deliveries.
 - 6. High and low temperature weather conditions.
 - 7. Accidents.
 - 8. Meetings and significant decisions.
 - 9. Unusual events (refer to special reports).
 - 10. Stoppages, delays, shortages and losses.
 - 11. Meter readings and similar recordings.
 - 12. Emergency procedures.
 - 13. Orders and requests of authorities having jurisdiction.
 - 14. Change Orders received and implemented.
 - 15. Construction Change Directives received and implemented.
 - 16. Services connected and disconnected.

17. Equipment or system tests and startups, include manufacturer's representative reports and certificates.
 18. Partial Completions and occupancies.
 19. Substantial Completions authorized.
- B. Material Location Reports: At bi-weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents to the DOT Construction Manager and Engineer.

2.5 SPECIAL REPORTS

- A. General: Submit special reports directly to DOT Construction Manager and Engineer within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating and response by Contractor's personnel, evaluation of results or effects and similar pertinent information. Advise DOT Construction Manager in advance when these events are known or predictable.

PART 3 EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction schedule Updating: At biweekly intervals, update schedule to reflect actual construction progress and activities. Issue 2 week look ahead schedule at each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finished and activity durations.
 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Engineer, DOT Project Manager, Client Representative, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need to know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.

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

END OF SECTION

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SECTION 01 33 00 - SUBMITTALS

PART 1 GENERAL

- A. Submittal Procedures: Coordinate submittal preparation with construction, fabrication, other submittals, and activities that require sequential operations. Transmit in advance of construction operations to avoid delay.
1. Coordinate submittals for related operations to avoid delay because of the need to review submittals concurrently for coordination. The Owner/Owner's Representative reserves the right to withhold action on a submittal requiring coordination until related submittals are received.
 2. Processing: Allow 2 weeks for initial review. Allow more time if the Owner/Owner's Representative must delay processing to permit coordination. Allow 2 weeks for reprocessing.
 - a. No extension of Contract Time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to permit processing.
 3. Submittal Preparation: Place a permanent label on each submittal for identification. Provide a 4- by 5-inch space on the label or beside the title block to record review and approval by the Contractor. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Contractor "Checked By" with initials.
 - d. Name and address of the Owner/Owner's Representative.
 - e. Name and address of the Contractor.
 - f. Name and address of the subcontractor.
 - g. Name and address of the supplier.
 - h. Name of the manufacturer.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 4. Submittal Transmittal: Package each submittal appropriately. Transmit with a transmittal form. The Owner/Owner's Representative will not accept submittals from sources other than the Contractor.
 5. Transmittal Form: Use AIA Document G810 (or Owner approved equal). On the form, record requests for data and deviations from requirements. Include Contractor's certification that information complies with requirements.
- B. Submittal Schedule: Prepare a schedule of submittals. Submit within 10 days of Contract Award by Owner.
1. Coordinate with list of subcontracts, and list of products.
 2. Prepare the schedule in chronological order. Provide the following information:
 - a. Date for first submittal.
 - b. Related Section number.
 - c. Submittal category (Shop Drawings, Product Data, or Samples).
 - d. Name of the subcontractor.
 - e. Description of the Work covered.
 - f. Date for the Owners final approval.

3. Schedule Distribution: Distribute copies of the Submittal Schedule to the Owner's Representative, subcontractors, and parties required to comply with submittal dates. Post copies in the field office.
 - a. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their Work and are no longer involved in construction activities.
 - b. Updating: Revise the schedule after each meeting or activity where revisions have been made. Issue the updated schedule concurrently with the report of each meeting.

- C. Shop Drawings: Submit newly prepared information drawn to scale. Indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information. Include the following information:
 1. Dimensions.
 2. Identification of products and materials included by sheet and detail number.
 3. Compliance with standards.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurement.
 6. Sheet Size: Except for templates and full-size Drawings, submit one correctable, reproducible print and one blue- or black-line print on sheets at least 8-1/2 by 11 inches but no larger than 36 by 48 inches. The Owner/Owner's Representative will return the reproducible print.
 - a. Do not use Shop Drawings without an appropriate final stamp indicating action taken.

- D. Product Data: Collect Product Data into a single submittal for each element of construction. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, mark copies to indicate applicable information.
 1. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
 2. Preliminary Submittal: Submit a preliminary single copy of Product Data where selection of options is required.
 3. Submittals: Submit 2 copies; submit 4 copies where required for maintenance manuals. The Owner's Representative will retain one and return the other marked with action taken.
 - a. Unless noncompliance with Contract Documents is observed, the submittal serves as the final submittal.
 4. Distribution: Furnish copies to installers, subcontractors, suppliers, and others required for performance of construction activities. Show distribution on transmittal forms. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
 - a. Do not use unmarked Product Data for construction.

- E. Samples: Submit full-size Samples cured and finished as specified and identical with the material proposed. Mount Samples to facilitate review of qualities.
1. Include the following:
 - a. Specification Section number and reference.
 - b. Generic description of the Sample.
 - c. Sample source.
 - d. Product name or name of the manufacturer.
 - e. Compliance with recognized standards.
 - f. Availability and delivery time.
 2. Submit Samples for review of size, kind, color, pattern, and texture, for a check of these characteristics, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed. Where variations are inherent in the material, submit at least 3 units that show limits of the variations.
 - a. Refer to other Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar characteristics.
 - b. Refer to other Sections for Samples to be incorporated in the Work. Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
 - c. Samples not incorporated into the Work, or designated as the Owner's property, are the Contractor's property and shall be removed from the site.
 3. Preliminary Submittals: Submit a full set of choices where Samples are submitted for selection of color, pattern, texture, or similar characteristics from standard choices. The Owner/Owner's Representative will review and return submittals indicating selection and other action.
 4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 3 sets. One set will be returned marked with the action taken. Maintain sets of Samples, at the Project Site, for quality comparison.
 - a. Unless noncompliance with Contract Documents is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
 5. Distribution of Samples: Distribute additional sets to subcontractors, manufacturers, and others as required for performance of the Work. Show distribution on transmittal forms.
- F. Quality Assurance Submittals: Submit quality-control submittals, including design data, certifications, manufacturer's instructions, and manufacturer's field reports required under other Sections of the Specifications.
1. Certifications: Where certification that a product or installation complies with specified requirements is required, submit a notarized certification from the manufacturer certifying compliance.
 - a. Signature: Certification shall be signed by an officer authorized to sign documents on behalf of the company.

- G. Owner/Owner Representative's Action: Except for submittals for the record or information, where action and return are required, the Owner/Owner's Representative will review each submittal, mark to indicate action taken, and return. Compliance with specified characteristics is the Contractor's responsibility.
1. Action Stamp: The Owner/Owner's Representative's will stamp each submittal with an action stamp. The Owner/Owner's Representative will mark the stamp appropriately to indicate the action taken.
 2. This review will only be good for general conformance with the design concept and the information given in the Construction Documents. Corrections and comments made on the shop drawings during this review do not relieve the Contractor from compliance with the requirements of the plans and specifications.
 3. Review of a specific item shall not include review of an assembly of which the item is a component. The Contractor is responsible for:
 - a. To confirm and correlate dimensions at the jobsite.
 - b. Information that pertains solely to the fabrication processes or the means, techniques, sequences and procedures of construction.
 - c. To coordinate the Work with that of all other trades.
 - d. To perform all Work in a safe and satisfactory manner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 45 00 - CUTTING AND PATCHING

PART 1 GENERAL

- A. Cutting and Patching Proposal: Submit a proposal describing procedures in advance of the time cutting and patching will be performed. Request approval to proceed. Include the following:
1. Describe extent of cutting and patching and indicate how it will be performed.
 2. Describe changes to existing construction, changes to structural elements and operating components, and changes in the building's appearance and other significant visual elements.
 3. List products to be used and firms that will perform Work.
 4. Indicate dates when cutting and patching will be performed.
 5. Utilities: List utilities that will be disturbed or relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
 6. Where cutting and patching involves structural elements, submit details showing integration with the original structure.
 7. Approval to proceed does not waive the Owner/Owner Representative's right to later require complete removal and replacement of unsatisfactory work.
- B. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.
1. Obtain approval before cutting and patching the following structural elements:
 - a. Foundation construction.
 - b. Bearing and retaining walls.
 - c. Steel beams or columns.
- C. Operational Limitations: Do not cut and patch operating elements in a manner that would reduce their capacity to perform as intended, increase maintenance or decrease operational life or safety.
1. Obtain approval before cutting and patching the following operating elements or safety related systems:
 - a. Primary operational systems and equipment.
 - b. Fire protection systems.
 - c. Electrical wiring systems.
- D. Visual Requirements: Do not cut and patch exposed construction in a manner that would, in the Owner/Owner's Representative's opinion, result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner.
- E. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged in such a manner as not to void warranties.

PART 2 PRODUCTS

- A. Use materials that visually match adjacent surfaces to the fullest extent possible. If identical materials are unavailable, use materials whose performance will equal that of existing materials.

PART 3 EXECUTION

- A. Examine surfaces to be cut and patched and conditions under which work is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action.
 - 1. Before proceeding, meet with parties involved. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect existing construction to prevent damage. Provide protection from adverse conditions for portions that might be exposed during cutting and patching operations.
- D. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- E. Avoid cutting pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.
- F. Performance: Employ skilled workmen. Proceed at the earliest feasible time and complete without delay.
 - 1. Cut construction to install other components or perform other construction and subsequent fitting and patching required to restore surfaces to their original condition.
- G. Cutting: Cut using methods that will not damage elements retained or adjoining construction. Comply with the original Installer's recommendations.
 - 1. Use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. To avoid marring finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Cut through masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.
 - 4. Where services are required to be removed, relocated, or abandoned, bypass utility services before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining pipe or conduit to prevent entrance of moisture or other foreign matter after bypassing and cutting.
- H. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
 - 1. Inspect and test patched areas to demonstrate integrity of the installation.
 - 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - 3. Where removing walls or partitions extends from one finished area into another, patch and repair floor and wall surfaces in the new space. Provide

an even surface of uniform color and appearance. Remove floor and wall coverings and replace with new materials to achieve uniform color and appearance.

- a. Where patching occurs in a smooth painted surface, extend final paint coat over entire surface containing the patch after the area has received primer and second coat.
 4. Patch, repair, or rehang ceilings as necessary to provide an air-tight, even-plane surface of uniform appearance.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar items. Clean piping, conduit, and similar features before applying paint or finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION

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SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: General requirements for delivery, storage, handling, and protection of materials and products used in the work.
- B. Related Sections:
 - 1. Operation and Maintenance Data: Section 01 78 20.

1.2 GENERAL REQUIREMENTS

- A. Store equipment and materials in an orderly manner in designated work site storage area. Only bring equipment and materials to work areas when needed. Assume responsibility for security of storage area and work site, and protect installed items until acceptance by Engineer of final performance tests.

1.3 STORAGE OF MATERIALS AND EQUIPMENT

- A. Store valves and gaskets, grass seed and any other items which manufacturer or supplier recommends be stored above 50 degrees F., on wooden or concrete floor in wooden or metal enclosed structure(s).
- B. Keep structure clean, dry and heated. Protect structure and subsequent work areas from dirt, dust, water, rain, snow, condensation, freezing conditions and any other conditions detrimental to life of equipment and material from date of delivery till control of equipment is assumed by Owner. Maintain 50 degrees F. minimum temperature within enclosure.
- C. Store mechanical and electrical equipment, instrumentation, valves, chemical bulk, batch and day tanks, gaskets, filter media, rubber material, caulking, sealants, paint, grass seed and any other items manufacturer recommends be stored above 50 degrees F. on a wooden or concrete floor in a wooden or metal enclosed structure(s). Structure to be clean, dry and heated. Protect structure and subsequent work areas from dirt, dust, water, rain, snow, condensation, freezing conditions and any other conditions detrimental to life of equipment and material, from date of delivery to the time control of equipment is assumed by Owner. Maintain temperature within enclosure to 50 degrees F. minimum.
- D. Store on platforms in an enclosed unheated structure protected from dirt, dust, water, rain, snow and direct sunlight, all architectural items, except caulking, sealants and rubber containing materials; wash water troughs, plates and walls; miscellaneous metals, filter underdrain; and similar items .
- E. Pipe, fittings, and steel may be openly stored, on wooden platforms. Schedule delivery of primed steel so as not be exposed directly to sunlight for over two months and will be installed and finished painted within five months after priming. If above requirement is not met, blast clean primer and re-prime steel.

- F. Properly store each item in accordance with manufacturer's recommendations and supplemental requirements included in particular specification section covering material or equipment. Store materials and equipment in a neat and orderly manner to facilitate locating, inspecting, maintaining and removing when needed. Avoid damage to any item during handling and storage. Handling of equipment is as specified under the particular material or equipment specification section and as recommended by the manufacturer. Repair damaged items to satisfaction of Engineer or replace if directed by Engineer at no additional cost to Owner.
- G. Check material and equipment when delivered to ensure it conforms to Contract Documents and Shop Drawings, and has not been damaged during shipment. Any materials or equipment not in compliance with Contract Documents and Shop Drawings will be directly returned to manufacturer. Report damaged items to attention of Engineer, who will decide whether item can be repaired in field or must be returned to manufacturer at no expense to Owner.

1.4 MAINTENANCE OF MATERIALS AND EQUIPMENT

- A. Obtain from manufacturer, prior to or at delivery, written instructions and recommendations for storing, handling, and maintaining material or equipment until it is field tested. In addition, operating and maintenance manuals will be provided for selected valves and equipment as specified in Section 01 78 20. Develop a comprehensive maintenance program and schedule from received information and submit to Engineer for approval for stored and installed material and equipment. Approval is for general procedures and content and in no way relieves responsibility for proper storage, protection, handling and maintenance of the equipment. If any materials and/or equipment are found not to be in an as new condition when it is to be installed or during testing, Engineer, at his discretion, may order the Contractor to furnish and install new material or equipment, or repair material or equipment to his satisfaction, at no additional cost to Owner.
- B. To reduce possibility of damage to materials and equipment which will not be used until the late stages of construction, schedule fabrication and deliveries if possible so that materials and equipment are only on storage site for a minimum of time before they are installed.

1.5 ADDITIONAL STORAGE SPACE

- A. If determined that additional storage space is needed, or preference to use nearby off site storage for some materials and equipment because of better controlled storage conditions and/or security, submit a written request to Engineer stating reasons for wanting the off-site storage; its location, size, type structure, type of heat if applicable, etc; and when it can be inspected by Engineer. If Engineer approves the off site storage site, all of above conditions and responsibilities pertaining to on site storage will apply. Assume all costs related to acquisition of off site storage facilities at no extra or additional cost to Owner.

1.6 RIGHT OF INSPECTION

- A. Owner and Engineer have right to inspect all storage sites and preventive maintenance records at any time. Immediately correct any noted deficiencies. Failure to note a deficiency on part of Owner and Engineer does not relieve responsibility for proper storage and maintenance of materials and equipment.

1.7 PROTECTION OF INSTALLED MATERIALS AND EQUIPMENT

- A. Protect all installed process, mechanical, electrical and architectural items in accordance with provisions established in Articles 1.02 and 1.03 above.

1.8 PROTECTION OF FINISHED FLOORS

- A. Protect finish of single course monolithic concrete floors against damage from equipment, piping, construction materials and operations, and traffic during construction period.
- B. Provide protective coverings consisting of plywood, planking, or other similar coverings approved by Engineer. Install covering to completely protect entire floor but not create a safety hazard.
- C. Installation of protective covering does not relieve responsibility for integrity of floor slabs. If any slabs become damaged, replace or repair to satisfaction of Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 70 00 - PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
- B. Related Sections include the following:
 - 1. Division 1 Section "Operation and Maintenance Data" for operation and manual requirements.
 - 2. Divisions 2 through 26 Sections for specific requirements for Project Record Documents of products in those Sections.

1.3 SUBMITTALS

- A. Record Drawings: Submit one set of marked up Record Prints indicating all deviations from the original contract drawings.
- B. Record Specifications: Submit one copy of Project Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal.
- D. Record Shop Drawings: Submit two copies of Project's Approved Shop Drawings and/or Erection Drawings.

PART 2 PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individually or entity is Installer, subcontractor, or similar entity, to prepare the marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.

- c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 2. Content: Types of items requiring marking include, but are not limited to:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of conduits and raceways.
 - e. Revisions to electrical circuitry.
 - f. Actual equipment locations.
 - g. Locations of concealed internal utilities.
 - h. Changes made by change order or construction change directive.
 - i. Changes made following Engineer's written orders.
 - j. Details not on the original Contract Drawings.
 - k. Field records for variable and concealed conditions.
 - l. Record information on the work that is shown only schematically.
 3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Documents.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 5. Mark important additional information that was either shown schematically or omitted from the original Drawings.
 6. Note construction change directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Newly Prepared Record Drawings: Prepare new drawings instead of preparing record drawings where Engineer determines that neither the original Contract Drawings nor the shop drawings are suitable to show actual installation.
1. New drawings may be required when a change order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Consult with Engineer for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark specifications to indicate the actual product installation where installation varies from that indicated in specifications, addenda, and contract modification.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of the manufacturer, supplier, installer, and other information necessary to provide a record of selections made.
 4. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.3. RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of the Project.
- B. Maintenance of Record and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.

END OF SECTION

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SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 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.

1.3 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, the value of items on the list, and reasons why the Work is not complete.
 2. Advise State 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, operation and maintenance manuals.
 5. Deliver tools, spare parts, extra materials, and similar items to location designated by State. Label with manufacturer's name and model number where applicable.
 6. Complete startup testing of systems.
 7. Submit test records.
 8. Complete final cleaning requirements, including touchup painting.
 9. 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. On receipt of request, Contracting Officer's authorized representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Contracting Officer's authorized representative will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by the Contracting Officer's authorized representative, which must be completed or corrected before certificate will be issued.
 1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 - 1. Submit Record drawings to A/E.
 - 2. Submit a final Application for Payment according to "General Conditions".
 - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Instruct State's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Contracting Officer's authorized representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Contracting Officer's authorized representative 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. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 WARRANTIES

- A. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Warranty will begin at date of Final Acceptance by the State.
 - 2. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 3. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 4. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

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

1.6 GUARANTEE

- A. All material, equipment and workmanship provided by each Contractor must be in first class operating condition in every respect at time of acceptance by Owner, or his Representative. Acceptance by the Owner, or his Representative, will be by letter written to each Contractor.

- B. Unconditionally guarantee in writing all materials, equipment and workmanship for a period of one (1) year from date of acceptance by Owner, or his Representative. During the guarantee period, repair or replace, at the Contractor's expense, any materials, equipment or workmanship in which defects

may develop and provide free service for all equipment and systems involved in the contract during this guarantee period. Beneficial use of any system by the Contractor during construction does not constitute acceptance by the Owner. Time period of this beneficial use cannot be included in the guarantee period.

- C. Guarantee must also include restoration to its original condition of all adjacent work that is disturbed in fulfilling this guarantee.
- D. All such repairs and/or replacements must be made without delay and at the convenience of the Owner, or his Representative.
- E. Guarantees furnished by Sub-Contractors and/or equipment manufacturers must be counter-signed by the Contractor for joint and/or individual responsibility for subject item.
- F. Manufacturer's equipment guarantees or warranties extending beyond the guarantee period described in item B above must be transferred to the Owner, or his Representative along with the Contractor's guarantees.

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 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:** Refer to General Conditions.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on State'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

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SECTION 01 78 20 - OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.1 SUMMARY

- A. This section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Emergency manuals.
 - 2. Operation manuals, subsystems, and equipment.
- B. See Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the work in those sections.

1.2 SUBMITTALS

- A. Manual: Submit three copies of each manual in final form at least 15 days before final inspection. Engineer will return copy with comments within 15 days after final inspection.
 - 1. Correct or modify each manual to comply with Engineer's comments. Submit 6 copies of each corrected manual within 15 days of receipt of Engineer's comments.

PART 2 PRODUCTS

2.1 MANUALS, GENERAL

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain a title page, table of contents, and manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of the facility.
 - 4. Date of submittal
 - 5. Name, address and telephone number of Contractor.
 - 6. Name and address of Engineer.
 - 7. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem and equipment. If possible, assemble instructions for subsystems, equipment and components of one system into a single binder.
1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2 by 11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL", project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
 4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for type of emergency, emergency instructions and emergency procedures.
1. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component for fire, flood, water leak, power failure, water outage, and equipment failure.
 2. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of the State's operating personnel for notification of installer, supplier, and manufacturer to maintain warranties.
 3. Emergency Procedures: Include instructions on stopping, shutdown instructions for each type of emergency, operating instructions for conditions outside normal operating limits, and required sequences for electric or electronic systems.

2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this section, include operation data required in individual specification sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.

- B. Descriptions: Include the following:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - 5. Operating characteristics.
 - 6. Limiting conditions.
 - 7. Performance curves.
 - 8. Engineering data and tests.
 - 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUAL

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in project manual.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of installer or supplier and maintenance service agent, and cross-reference specification section number and title in project manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment.
- D. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassemble instructions, and adjusting instructions that detail essential maintenance procedures.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipments, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 EXECUTION

3.1 MANUAL PREPARATION

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by the State's operating personnel for types of emergencies indicated.

- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.

END OF SECTION

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SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of existing asphalt pavement.
 - 2. Salvage of existing items to be reused or recycled.

1.2 MATERIALS OWNERSHIP

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

1.3 PRE-INSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers.
- B. Schedule of demolition activities with starting and ending dates for each activity.
- C. Pre-demolition photographs or video.

1.5 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before selective demolition, Owner will remove the following items:
 - a. Supplies and containers.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

- F. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Inventory and record the condition of items to be removed and salvaged.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 1. Arrange to shut off utilities with utility companies and coordinate with owner.
 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent

unexpected or uncontrolled movement or collapse of construction being demolished.

- C. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 4. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
 5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 6. Dispose of demolished items and materials promptly and with all applicable regulations.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition, cleaned, and reinstalled in their original locations after selective demolition operations are complete.

3.5 CLEANING

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 07 84 00 - FIRESTOPPING

PART 1 GENERAL

1.1 SUMMARY

- A. Related Documents
 - 1. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section includes firestopping and through-penetration protection system materials and accessories; firestopping tops of fire rated walls; and smoke sealing at joints between floor slabs and exterior walls.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. ASTM E119 – Standard Test Methods for Fire Tests of Building construction and Materials.
 - 3. ASTM E814 – Standard Test method for Fire Tests of Through – Penetration Fire Stops.
- B. Underwriters Laboratories Inc.:
 - 1. UL 263 - Fire Tests of Building Construction and Materials.
 - 2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
 - 3. UL 1479 - Fire Tests of Through-Penetration Firestops.
 - 4. UL - Fire Resistance Directory.

1.3 DEFINITIONS

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 SYSTEM DESCRIPTION

- A. Firestopping Materials: ASTM E814 UL 1479 to achieve fire ratings as indicated for adjacent construction, but not less than 1-hour fire rating. Surface Burning: ASTM E84 UL 723 with maximum flame spread / smoke developed rating of 25/450.
- B. Firestop interruptions to fire rated assemblies, materials, and components.

1.5 PERFORMANCE REQUIREMENTS

- A. Conform to applicable code and UL for fire resistance ratings and surface burning characteristics.

1.6 SUBMITTALS

- A. General: Submit the following according to the General Conditions.

- B. Product Data: Submit data on product characteristics, performance and limitation criteria.
- C. Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.
- D. Manufacturer's Installation Instructions: Submit preparation and installation instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements. Applicable code requirements

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.
- B. Applicator: Company specializing in performing Work of this section

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when temperature of substrate material and ambient air is below 60 degrees F.
- B. Maintain this minimum temperature before, during, and for minimum 3 days after installation of materials.
- C. Provide ventilation in areas to receive solvent cured materials.

PART 2 PRODUCTS

2.1 FIRESTOPPING

- A. Manufacturers:
 - 1. Dow Corning Corp.
 - 2. Hilti Corp.
 - 3. 3M fire Protection Products.
 - 4. Nelson Firestop Products
 - 5. Or approved equal.
- B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
 - 1. Silicone Firestopping Elastomeric Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
 - 2. Foam Firestopping Compounds: Single or Multiple component foam compound.
 - 3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.

4. Fiber Stuffing and Sealant Firestopping: Composite of mineral fiber stuffing insulation with silicone elastomer for smoke stopping.
 5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
 6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
 7. Firestop Pillows: Formed mineral fiber pillows.
- C. Color: As selected from manufacturer's full range of colors.

2.2 ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- B. Dam Material: Permanent:
1. Mineral fiberboard.
 2. Mineral fiber matting.
 3. Sheet metal.
 4. Alumina silicate fire board.
- C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify openings are ready to receive firestopping.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Install backing damming materials to arrest liquid material leakage.

3.3 APPLICATION

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.
- B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating to uniform density and texture.

- D. Compress fibered material to maximum 40 percent of its uncompressed size.
- E. Place foamed material in layers to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.
- F. Place intumescent coating in sufficient coats to achieve rating required.
- G. Remove dam material after firestopping material has cured.

3.4 FIELD QUALITY CONTROL

- A. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.5 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Protect adjacent surfaces from damage by material installation.

3.7 SCHEDULES

LOCATION	UL/FM FIRE RATING
Main floor fire walls.	2 hours
Elevator shaft walls.	2 hours
Room to room partitions, metallic pipe, ductwork and conduit.	2 hour
Room to room partitions, non-metallic pipe, ductwork and conduit.	2 hour
Floors, metallic pipe, ductwork and conduit.	2 hour

END OF SECTION

SECTION 31 23 33 - TRENCHING AND BACKFILLING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Excavating, backfilling, and compacting trenches for conduits, within limits specified or indicated on Drawings.

1.2 REFERENCES

- A. American Society for Testing and Materials:
 - 1. ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil using Standard Effort (12,400 ft.-lbf/ft.3).
 - 2. ASTM D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 DEFINITIONS

- A. Earth Excavation: Removal down to subgrade elevation of clay, silt, loam, sand, gravel, slate, hard pan, pavements, soft sandstone, loose stone in masses, and boulders measuring less than 1/2 cubic yard.
- B. Rock Excavation: Removal down to subgrade elevation of large rock and boulders measuring more than 1/2 cubic yard, or other rock requiring continuous drilling and blasting, or drilling and wedging in opinion of Engineer.
 - 1. Material that can be removed by means other than specified above, but for reasons of economy, removal by drilling and blasting, or drilling and wedging is preferred, will not be classified as rock.
 - 2. Unless predrilling or predrilling and blasting are approved in advance by Engineer, strip rock for measurement by Engineer. No payment will be made for rock excavated or loosened before measurement.
- C. Unclassified Excavation: Material removal of any kind in excavation, including Rock Excavation.
- D. Unclassified Excavation Below Subgrade: As specified for Unclassified Excavation except performed below subgrade.
- E. Subgrade: Trench bottom prepared as specified to receive conduit bedding, or excavation bottom prepared to receive in-line structures.

1.4 SUBMITTALS

- A. Test Reports:
 - 1. Aggregate Material Tests: Submit testing laboratory aggregate test reports based on requirements stated in Quality Control.
 - 2. Compaction Density Tests: Submit compaction density test reports based on method of density determination as specified in Reference Standards and method approved by Engineer.
- B. Aggregate Certificates: Submit certificate from aggregate supplier based on requirements stated in Quality Control, when requested by Engineer.
- C. Blasting Plan:
 - 1. Blasting is not permitted on this project.
- D. Testing Agency: Submit name and qualifications of Testing Agency performing seismographic tests to Engineer for approval prior to proceeding with blasting operations.

1.5 QUALITY ASSURANCE

- A. Quality Control:
 - 1. Laboratory Tests: Aggregate materials under Part 2 - Products require advance examination or testing according to methods referenced, or as required by Engineer.
 - a. Arrange for testing laboratory to furnish Engineer test result reports in triplicate. Test reports are considered sufficient evidence of acceptance or rejection of materials represented.
 - b. Conduct aggregate quality tests in accordance with requirements of appropriate Referenced Standard.
 - c. Engineer reserves right to accept aggregate materials based on certification from supplier that aggregate originates from a source approved by NJDOT and that aggregate complies with specified NJDOT requirements.

1.6 PROJECT CONDITIONS

- A. General Requirements: Excavate and backfill trenches necessary for completing work of this Contract. Excavate and backfill trenches by machinery or by hand, however, Engineer is empowered, if necessity exists, to direct that hand excavation and backfilling be employed. Perform excavation of whatever substances encountered, to grades and depths indicated on Drawings, as specified, or as directed by Engineer. Remove and waste excavated material not required for backfill.
- B. Environmental Requirements:
 - 1. Do not perform trenching, backfilling or compacting when weather conditions or condition of materials will prevent satisfactory work, in opinion of Engineer.

2. Do not use frozen materials as backfill or wet materials containing moisture in excess of quantity necessary for satisfactory compaction.
 3. Prior to use, moisten dry backfill material not having sufficient moisture to obtain satisfactory placement or compaction.
 4. Plan work to provide adequate protection during storms with provisions available constantly for preventing flood damage. Protect installed piping and other work against damage from uplift due to high ground water levels.
 5. Accommodation of Drainage: Keep gutters, sewers, drains and ditches open constantly for surface drainage. No damming, ponding, water in gutters, or other waterways permitted, except where stream crossings are necessary and then only to extent Engineer considers necessary. Do not direct water flows across or over pavements except through approved pipes or properly constructed troughs. When required, provide pipes or troughs of sizes and lengths required at no expense to Owner. Perform grading in vicinity of trenches so that ground surface is properly pitched to prevent water running into trenches.
 6. Pumping: Keep excavations free from water during performance of work at no expense to Owner. Build dams and other devices necessary for this purpose, and provide and operate pumps of sufficient capacity for dewatering excavations. Provide for disposal of water removed from excavations in a manner not to cause injury to public health, public or private property, work of others, portions of work completed or in progress, or produce an impediment to street, road and highway usage.
 7. When necessary to haul soft or wet soil material over roadways, use suitably tight vehicles to prevent spillage. Clear away spillage of materials on roadways caused by hauling.
 8. Provide effective dust control by sprinkling water, use of calcium chloride or other method approved by Engineer. Employ dust control when, where and in a manner required by Engineer.
 9. Comply with Section 01 57 13, Erosion and Sediment Control.
- C. Explosives and Blasting: Not permitted in performance of trenching work.
- D. Responsibility for Condition of Excavation: Assume responsibility for condition and results of excavation. Remove slides and cave ins at whatever time and under whatever circumstance they occur.
- E. Protection: Assume risks attending presence or proximity of overhead or underground public utility and private lines, pipes, conduits and support work, existing structures and property of whatever nature. Assume responsibility for damages and expenses for direct or indirect injury to structures or to person or property by reason of them or by reason of injury to them; whether structures are or are not shown on Drawings, by work of this Contract.
- F. Removal of Obstructions:
1. Remove, realign or change direction of above or below ground utilities and appurtenant supports, if required in opinion of Engineer. Perform as extra work unless performed by owner of obstruction without cost to Contractor. However, uncover and sustain obstruction at no additional cost prior to final disposition of obstruction. No claims for damage or extra compensation due to presence of obstructions or delay in removal or rearrangement of

- obstructions will be made. Additional precautions concerning obstructions as follows:
- a. Do not interfere with persons, firms, corporations or utilities employing protective measures, removing, changing or replacing their property or structures, but allow taking measures necessary or advisable under circumstances, without relieving responsibilities of Contract.
 - b. Without extra compensation, break through and reconstruct if necessary, invert or arch of sewers, storm drain, culvert or conduits encountered if structure is in a position, in judgment of Engineer, as not to require its removal, realignment or complete reconstruction.
- G. Excess Materials: No right of property in materials is granted for excavated materials prior to backfilling. This provision does not relieve responsibility to remove and dispose of surplus excavated materials. Obtain written consent and any necessary permits and approvals before disposing of excess materials at an off-site location.
1. Conform to DEP Clean Fill Policy.
- H. Change of Trench Location or Depth:
1. Should Engineer require a change in location of a trench from that indicated on Drawings due to presence of an obstruction, or from other cause, and change in location is made before excavation is begun, no extra compensation or claim for damages will be granted.
 2. If a change in trench location made at requirement of Engineer involves abandonment of excavation already made, abandoned excavation, together with necessary refill is classed as unclassified excavation and backfill as applicable, in case full width of trench has not been abandoned.
 3. If a change in trench location made at requirement of Engineer involves abandonment of excavation already made, abandoned excavation, together with necessary refill is classed as earth or rock excavation and backfill as applicable, in case full width of trench has not been abandoned.
 4. If a changed location of a trench is authorized by Engineer upon Contractor's request, Contractor is not entitled to extra compensation or to a claim for damage. If change of trench location involves abandonment of excavation already made, abandoned excavation and refill is at Contractor's expense.
- I. Classification of Excavated Materials: No consideration will be given to nature of materials encountered in trenching operations. Therefore, as unclassified trenching, no additional payment will be made for difficulties occurring in excavating and handling of materials.
- J. Maintenance of Roads and on-site Parking Lot:
1. The Contractor shall be responsible during the term of the Contract for the prompt and efficient removal, to the satisfaction of the Engineer and the owners of state, city, borough and township roads, of any soil or other debris deposited on roads or adjacent areas as a result of the Contractor's activities associated with the work to be performed under this Contract.
 2. If the Contractor fails to repair or clean a road surface and adjacent areas in a timely manner or fails to repair or clean the road surface and adjacent areas to the satisfaction of the owner of the road, the owner of the road or the Owner has the right to perform the corrective work and charge the Contractor

for the cost incurred. If the Contractor fails to pay the charges, said charges will be deducted by the Owner from the contract bid price.

PART 2 PRODUCTS

2.1 MATERIAL

- A. General: All materials to be free of topsoil, plant life, lumber, metal, refuse, coal waste, slag and cinders
- B. Approved Backfill: On site excavated soil or soil-rock mixed materials free of rocks or similar hard objects larger than six inches in any dimension. Rocks or similar hard objects are not to represent more than 20 percent of backfill by volume.
- C. Select Backfill:
 - 1. On site excavated material free of rocks or similar hard objects larger than one inch in any dimension.
 - 2. Coarse Aggregate, Size No. 57 Backfill conforming to NJDOT Specifications.
- D. Aggregate Backfill: Coarse Aggregate, Size No. 57 Backfill conforming to NJDOT Specifications.
- E. Pipe Bedding: Coarse Aggregate, Size No. 57 Backfill conforming to NJDOT Specifications.

PART 3 EXECUTION

3.1 PREPARATION

- A. Trench Line and Grade: Maintain trench line and grade as follows:
 - 1. Control Points: Prior to excavation for a run of piping, set control points for line and grade indicated on the Drawings. Compute the depth of cut to pipe line invert from top of grade stakes or other control points. Use the computed depths of cut as guides for rough excavation allowing for excavating to accommodate the required bedding and concrete encasement or cradles.
 - a. Set control points sufficiently offset from the trench centerline to prevent loss of the points during the work. Set control points 25-feet apart maximum.
 - b. In unpaved areas, mark control points on the top portion of stakes and in paved areas, drive spikes or cut crosses into the paving, both encircled with paint.
 - 2. Batter Boards and Grade Stakes: As rough excavation is completed set grade stakes or batter boards of rough lumber across the trench opposite the control points. Securely set up and support each batter board to prevent accidental displacement and to ensure each board being leveled equidistant above the pipeline invert.
 - a. Run a taut string-line between the batter boards directly over the proposed pipeline centerline. Use the string-line as a control for maintaining pipeline grade and horizontal alignment.

- b. To check the vertical distance from string-line to pipe invert, use a grade stake or pole, with a true right-angled offset designed to rest on the pipe invert.
 - c. Use a plumb line from the string-line to the center of pipe to maintain horizontal alignment.
3. Maintenance of Line and Grade by Other Approved Methods: Subject to the Owner's prior approval, the Contractor may have the option to use methods customary to the utilities construction industry to maintain lines and grades of pipelines.
- a. Laser: If a laser beam instrument is approved for use by the Owner, perform field checks of the beam position every fifty feet of installed pipeline. Use survey or other approved method to perform the laser beam position check.

3.2 PERFORMANCE

- A. Perform soil erosion control work in accordance with requirements of NJDEP.
- B. Excavating: Perform excavation and backfilling using machinery except that hand excavation and backfilling may be required where necessary to protect existing structures, utilities, private or public properties. No additional compensation will be paid for hand excavation and backfilling instead of machine excavation and backfilling as may be necessary.
 1. Remove surface materials of whatever nature, including pavement and topsoil, over line of trenches and other excavations and properly separate and store removed materials as suitable for use in backfilling or other purposes.
 - a. Remove pavement in accordance with requirements of Section 32 10 00.
 2. Remove subsurface materials of whatever nature, including rock, masonry and cementitious materials, down to subgrade elevation. Properly separate and store removed subsurface materials as suitable for use in backfilling.
 3. Remove rock to subgrade at least 25 feet in advance of pipe laying.
 4. Remove rock below subgrade if shattered due to excessive drilling, and in opinion of Engineer it is unfit for foundations. No separate or additional payment will be made for removal and backfill due to excessive drilling.
 5. Excavate rock in miscellaneous excavations to extent required by Engineer.
 6. Remove and waste or otherwise dispose of excavated materials not required for backfill at no expense to Owner.
- C. Trench Width and Depth: For full depth of trench, maximum trench pay width is a vertical plane as indicated in the Trench Width Tables on the Drawings. If sheeting is required, Table dimensions apply to the inside face of sheeting.

TABLE A	
Diameter of Pipe	Maximum Trench Width (Outside Diameter of Pipe at Barrel Plus)
3 through 36 inches	24 inches
42 through 72 inches	30 inches
Larger than 72 inches	36 inches

1. Depth: Excavate below planned bottom of pipe, 4 inches in earth and 8 inches in rock.
2. No additional compensation will be paid for excavation beyond trench widths indicated in Trench Width Tables unless approved in writing by Engineer.
3. Excavate rock for manhole, chamber, catch basin or other structure installations 1 foot outside exterior lines of structure walls and to a depth of outside bottom.

D. Trench Width and Depth: For the purposes of measurement and payment only, trench widths and depths have been established as specified herein. No additional compensation will be paid for excavation beyond the specified trench width maximums in the Trench Width Tables on the Drawings.

1. Pipe Embedment Area: In the pipe embedment area (which extends from subgrade elevation to an elevation at least twelve inches above the top of the outside barrel of the pipe), and for measurement and payment purposes only, the trench banks will be considered as nearly vertical and not less than the minimum nor more than the maximum width specified in the Trench Width Tables on the Drawings.

TABLE A		
Diameter of Pipe	Minimum Trench Width (Outside Diameter of Pipe at the Barrel Plus)	Maximum Trench Width (Outside Diameter of Pipe at the Barrel Plus)
through 24 inches	12 inches	16 inches
27 through 36 inches	20 inches	24 inches
42 through 72 inches	26 inches	30 inches
Larger than 72 inches	30 inches	36 inches

2. Remainder of Trench: Beginning at a point twelve inches above the top of the outside barrel of the pipe, and for measurement and payment purposes only, trench banks will be considered as nearly vertical, with the trench width at the top not exceeding the outside diameter of the pipe at the barrel plus the dimensions in in the Trench Width Tables on the Drawings.

Diameter of Pipe	Maximum Trench Width at Top of Trench (Outside Diameter of Pipe at the Barrel Plus)
through 24 inches	40 inches
27 through 36 inches	48 inches
42 through 72 inches	54 inches
Larger than 72 inches	60 inches

3. Excavation Width and Depth for In-Line Structures (Includes Manholes):
Excavations will be considered as nearly vertical beginning at bottom of excavation one-foot beyond in-line structure base outside dimension (six inches each side) to two feet beyond in-line structure base outside dimension for top of excavation limit (one foot each side).
 - a. If surface pavement of any type is encountered (vehicle or pedestrian ways), cut such pavement to a rectangular shape as opposed to circular shape of in-line structure. Make limits of cut not to exceed one foot beyond top of excavation limit as specified. No additional compensation allowed for surface pavement cuts exceeding the specified limits.
 - b. Additionally, should bottom of excavation limit be exceeded, provide without additional compensation, concrete cradle or encasement for pipes entering or leaving manhole or in-line structure.

- E. Additional Trench Width Excavation: The Engineer's written requirement for excavation beyond the maximum allowable trench width shall entitle the Contractor to reimbursement for the quantities of additional excavation in accordance with the General Conditions.

- F. When unsuitable material is found below subgrade, as determined by Engineer, remove material to a depth determined by Engineer, and provide Pipe Bedding compacted in 4 inch layers.

- G. Length of Open Trench: Engineer has right to limit quantity of trench opened in advance of pipe laying and quantity of pipe laid in advance of backfilling, but in no case are these quantities to exceed 300 feet and 100 feet respectively. Complete trench excavation at least twenty five feet in advance of pipe laying and keep trenches free from obstructions, except that at end of a work day or at discontinuance of work, pipe laying may be completed to within five feet of end of open trench. Additional open trench limitations as follows:
 1. Engineer is empowered to require trench backfilling over completed pipe lines at any time if in his judgment it is necessary. No claim for extra compensation will be allowed for trench refilling even though work stopped elsewhere as a result.
 2. If trenching work is stopped for any reason, except as required by Engineer, and excavation is left open for an unreasonable period in advance of construction in opinion of Engineer, Engineer may order trench refilling at no additional expense and not allow trench reopening until ready for actual use.

- H. Excavated Material Storage:
 1. In streets, roads, and highways, or in other locations where working space is limited, remove excavated materials from first 100 feet of opening as soon as

- its excavated, when required by Engineer. Store and return excavated materials for backfilling when required, at no expense to Owner. In no case cast excavated material beyond curb or Right-of-Way lines or on sidewalks or lawns.
2. Where more material is excavated from trenches than can be backfilled or stored on street or within Rights-of-Way limits, leaving space for traffic and drainage, remove and store excess material. Return excess material for backfilling when required, at no expense to Owner.
- I. Subgrade Preparation: Provide Pipe Bedding in trenches as pipe foundations. Depth of Bedding is indicated on Drawings. If maximum trench widths specified in Trench Width Table are exceeded, provide concrete cradle or concrete encasement at no expense to Owner.
- J. Backfilling: Perform trench backfilling and backfilling excavations for other in line structures by methods resulting in thorough compaction of backfill material without displacement of grade and alignment of pipeline and its appurtenances and minimum settlement of backfilled material. Displacement of pipeline and settlement of backfill will be considered evidence of improper workmanship or inclusion of unsuitable backfill materials, or both, and will require regrading and realigning pipeline and removing and re-compacting settled material at no expense to Owner. Following pipe bedding, piping and inline structure installation, backfill trenches in following manner:
1. Parking Lots and Driveways: Backfill trenches to a height at least one foot above top of outside barrel of pipe with Select Backfill material placed in four inch layers, or as shown on the plans. Carefully place this backfill in a manner not to damage or disturb pipe. Backfill remainder of trench with Coarse Aggregate, Size No. 57 Backfill compacted in four inch layers to bottom of temporary or permanent paving. If vibratory compaction equipment is used, lifts may be 8 inches.
 2. Additional Requirements for Piping Bedding and Backfill:
 - a. Assure that sufficient Pipe Zone Bedding material is worked under the haunching of the pipe to provide adequate side support.
 - b. Prevent movement of pipe during placing of material under the pipe haunch. Walking or standing on pipe will not be permitted.
 - c. Excessive tamping of Select Backfill material over the top of the pipe will not be permitted.
 - d. Do not use rolling equipment or heavy tampers to consolidate backfill until at least two feet of backfill is placed over the top of the pipe.
- K. Compacting: During course of backfilling and compacting work, Engineer may, at any location or depth of trench, require Contractor to perform tests to determine whether compaction operations are sufficient to meet specified requirements. Compact trench backfill as follows:
1. Solidly tamp each layer of required backfill around pipe with proper tamping tools made especially for this purpose.
 2. Thoroughly compact aggregate backfill with a vibratory compactor of type and size satisfactory to Engineer and NJDOT. Compacting of aggregate backfill by puddling or jetting is not permitted.
 3. Use mechanical tampers to compact backfill materials in trench refill operations to produce a density at bottom of each layer of not less than 95

percent of maximum density obtained at optimum moisture content as determined by ASTM D698. Perform field determinations of density, in accordance with ASTM D6938. Make a minimum of two field determinations for each lift of backfill for every 100 ft. length of trench.

- L. Cleanup:
1. Remove surplus excavated material, rubbish and other construction debris, and keep removed to a point not more than two hundred feet from head of open trench, unless otherwise authorized by Engineer.
 2. After trenches and other excavations are backfilled and work completed, remove surplus excavated materials, rubbish or other materials from work site. Dispose of materials off site in a lawful manner at no additional expense to Owner.
 3. Evenly spread and leave in neat, smooth condition excavated material disposed of lawfully on public property.
 4. Furnish and place topsoil, fertilize and seed grassed areas, within and outside Rights-of-Way affected by construction. Reseed and re-fertilize areas that fail to show a uniform stand of grass. Water, mow, rake, weed and otherwise maintain grass until final acceptance of Contract.
 5. Restore area covered by temporary and permanent Rights-of-Way to as near original conditions as is practical. Bring area up to original grade, place topsoil, seed, and replant or replace shrubbery, repair or replace walks, driveways, fences and other improvements, damaged or removed.
 6. When repaving over trenches and other excavations is completed, sweep paved surfaces affected by work using hand or power sweepers, and if required by Engineer, flush with water to remove dust and small particles.
 7. In case Contractor fails or neglects to do so or makes unsatisfactory progress in doing so, within twenty four hours after receipt of a written notice from Engineer, Owner may remove surplus material and clear roadways, sidewalks and other places, and expense for work charged to Contractor and deducted from moneys due or to become due him under Contract.
 8. Comply with applicable requirements of Section 01 74 00.
- M. Maintenance: Assume responsibility for injury or damage resulting from lack of trench maintenance during guarantee period. If trench surfaces are not satisfactorily maintained or repairs begun within seven days after written notice from Engineer, repairs may be made by Owner, and cost charged against Contractor.

END OF SECTION

SECTION 32 10 00 - BASES, BALLASTS AND PAVEMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Removal and replacement of existing pavement.
 - 2. Paving or surfacing of access roads and parking areas.
 - 3. Surface preparation, patching and bituminous overlay paving.
 - 4. Sidewalks and curbs.

1.2 REFERENCES

- A. NJDOT Sections referenced below pertain only to materials, construction equipment, methods and labor. Payment provisions do not apply to work performed under this Contract.
- B. State of New Jersey Department of Transportation Specifications, as supplemented.
- C. State of New Jersey Department of Transportation Standards for Roadway Construction

1.3 DEFINITIONS

- A. Street: The term Street as used in this Section is understood to mean a street, highway, avenue, boulevard, road, alley, lane, driveway, parking lot, or other area used as a way for vehicles.
- B. Specified Maximum Trench Width: Applicable maximum trench width as indicated on the Drawings.

1.4 SUBMITTALS

- A. Product Data:
 - 1. Submit traffic paint material manufacturer's technical information, including paint label analysis and application instructions for each material proposed.
- B. Quality Assurance/Control Submittals:
 - 1. Design Data: Submit job mix formula for approval.
 - 2. Certificates: Furnish certification from bituminous and aggregate producer attesting that materials conform to requirements of New Jersey Department of Transportation Specifications.

1.5 QUALITY ASSURANCE

- A. Producer Qualifications:
 - 1. Maintain quality of work by using products of a qualified bituminous concrete producer and qualified plant operating workers.

2. Use products of a bituminous concrete bulk producer regularly engaged in production of hot-mix, hot-laid bituminous concrete conforming to referenced standards.
 3. Use materials conforming to requirements of State of New Jersey Department of Transportation Specification, as supplemented.
- B. Workmen Qualifications:
1. Provide at least one person thoroughly trained and experienced in skills required, readily understands design and is completely familiar with application of bituminous concrete paving work. This person is required to be present during progress of bituminous concrete paving work and direct performance of work.
 2. Employ personnel thoroughly trained and experienced in skills required for actual finishing of bituminous concrete surfaces and operation of equipment.
- C. State Highway Regulatory Requirements:
1. Removal, protection and replacement of paving on State Highways is subject to inspection by State of New Jersey Department of Transportation representatives. Perform work in accordance with requirements of State of New Jersey.
 2. Pavement removal and replacement requirements on State Highways specified in this Section are requirements of Highway Occupancy Permit obtained by Owner and supersede similar requirements of Title 67, Chapter 459, regulations. However, requirements of Highway Occupancy Permit are subject to change by NJ Department of Transportation.
 3. Inspection, insurance or other charges demanded by State of New Jersey Department of Transportation, or other authority having jurisdiction will be paid for by Contractor whether billed to Owner or Contractor.
- D. Local Roadway Agency Regulatory Requirements:
1. Perform removal, protection and replacement of paving on county and Township roads in accordance with requirements of the authority having jurisdiction.
 2. Perform removal, protection and replacement of paving on streets other than State Highways in accordance with requirements of authority having jurisdiction.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Use means necessary to ensure safe storage and use of paint materials and prompt and safe disposal of waste. Store paint products protected from weather when products may be affected by freezing.

1.7 PROJECT CONDITIONS

- A. Environmental Requirements:
1. Dust Control: Provide effective dust control by sprinkling water, or by other methods as approved by the Engineer. Use dust control measures where and when, and in a manner as required by the Engineer.

2. Weather Limitations: Terminate placement of bituminous concrete surface courses of permanent pavement between October 15 to 31, and do not resume placement prior to April 1 to 15. Interim days between date limits may be used for placement as determined by Engineer depending on weather conditions.
 - a. Do not install aggregate courses when ambient temperature is below or is expected to fall below freezing.
 - b. Do not use aggregate containing frost nor place aggregate courses on frozen subgrade.
 - c. Do not place bituminous concrete surface courses of permanent pavement when ambient temperature is 40 degrees F. or lower, or when temperature of substrate, pavement base or binder is 40 degrees F. or lower.
 3. Weather Limitations: Do not place HMA paving mixtures between October 31 and April 1 unless permitted otherwise in writing by the Engineer.
 - a. HMA Base Course: Do not place base course when surfaces are wet or when the temperature of either the air or the surface on which the mixture is to be placed is 35 degrees or lower.
 - b. HMA Wearing Course: Do not place base course when surfaces are wet or when the temperature of either the air or the surface on which the mixture is to be placed is 40 degrees or lower.
 4. Paint Application Limitations: Adhere to manufacturer's data on air and surface temperature limits and relative humidity during application and curing of coatings.
 - a. Do not spray apply paint when wind velocity is above 15 mph.
 - b. Schedule painting work to avoid dust and airborne contaminants.
 - c. Apply paint during daylight hours only.
- B. Time Requirements:
1. State Highways: Permanent replacement of street roadway and shoulder pavement not permitted until at least 90 days after required temporary pavement has been placed. However, place permanent replacement pavement before 210 days after required temporary pavement has been placed.
 2. Streets Other Than State Highways: Place permanent replacement of street roadway and shoulder pavement as soon as trenches have been acceptably backfilled; however, in event permanent pavement cannot be placed due to weather limitations specified previously, provide a temporary pavement. No separate or additional payment allowed for furnishing, placing and removing temporary pavement.
- C. Protection:
1. Protect and maintain cut pavement edges until permanent replacement pavement is placed.
 2. Protect paved surfaces outside of pavement removal limits. Repair pavement outside removal limits damaged by constructing operations at no additional expense to Owner.

3. Use means necessary to protect and maintain pavement materials before, during, and after installation to protect installed work and materials of other trades.
 4. In event of damage or failure of work of this Section within Guarantee Period, immediately make repairs and replacements. Failure to perform maintenance or repairs within three days after notice from Owner or Engineer, entitles Owner to perform maintenance or repairs and deduct cost from moneys due or to become due Contractor under this Contract.
 5. Assume responsibility for injury or damage resulting from lack of required maintenance or repairs during Guarantee Period. Indemnify and save harmless Owner and Engineer from loss by reason of suit or action at law, based upon occurrence or omission occurring during this period.
- D. Paving Work for Other Contracts: NOT USED
- E. Unless otherwise specified or required by the Engineer, overlay paving of streets will not be permitted until all other work to be performed under this contract has been completed.
- F. Completion Certificate not issued until work of this Section is completed.

PART 2 PRODUCTS

2.1 BASE COURSE MATERIALS

- A. Subbase:
1. Coarse Aggregate: Type C, or better, stone conforming to NJDOT.
- B. Bituminous Concrete Base Course (BCBC): Conforming to NJDOT Section 305.
- C. HMA Base Course: Superpave Asphalt Mixture Design, HMA Base Course (Standard) conforming to NJDOT Standard Specifications. Mixture Design as follows:
1. HMA Base Course, PG 64-22, 0.3 to <3 Million ESALs, 25 mm Mix, 4 inch depth.
 2. HMA Base Course, PG 64-22, 0.3 to <3 Million ESALs, 25 mm Mix, 3 inch depth.
 3. HMA Base Course, PG 64-22, 0.3 to <3 Million ESALs, 37.5 mm Mix, 7 inch depth.
 4. HMA Base Course, PG 64-22, 0.3 to <3 Million ESALs, 37.5 mm Mix, 5 inch depth.
 5. HMA Base Course, PG-58-28,
 6. HMA Base Course,
- D. Aggregate Base Course:
1. Coarse Material: Crushed Type A, or better, stone conforming to NJDOT Section 703.2, AASHTO No. 1.
 2. Fine Material: Crushed Type A, or better, stone conforming to NJDOT Section 703.2, AASHTO No. 10.

3. Select Granular Material (2RC): Crushed gravel, stone or slag conforming to NJDOT Section 703.3.
- E. Plain Cement Concrete Base Course:
1. High early strength cement concrete (HES) conforming to NJDOT Section 704.
 2. Class A cement concrete (normal strength) conforming to NJDOT Section 704.
- F. Reinforced Cement Concrete Base Course:
1. High early strength cement concrete (HES) conforming to NJDOT Section 704.
 2. Reinforcement, NJDOT Section 709; Load Transfer Units, NJDOT Section 705.
- G. Aggregate-Bituminous Base Course: Conforming to NJDOT Section 320.
1. Coarse Aggregate: Type C, or better, stone conforming to NJDOT Section 703.2, No. 2A aggregate.
 2. Bituminous Material: Use one of the following conforming to NJDOT Section 702 and Bulletin 25.
 - a. Asphalt Cement: Class PG 64-22.
 - b. Emulsified Asphalt: Class E-4 or E-5.

2.2 SURFACE COURSE MATERIALS

- A. Bituminous Pavements:
1. Wearing Course: Hot mixed, hot laid, Bituminous Wearing Course ID-2: Conforming to NJDOT Section 420.
 2. Binder Course: Hot mixed, hot laid, Bituminous Binder Course ID-2 conforming to NJDOT Section 421, using asphalt cement.
 3. Bituminous Surface Treatment: Conforming to NJDOT Section 480.2.
 4. Bituminous Prime Coat: Conforming to bituminous material requirements of NJDOT Section 461.2(a).
 5. Bituminous Seal Coat: Conforming to NJDOT Section 470.2.
- B. HMA Wearing Course: Superpave Asphalt Mixture Design, HMA Wearing Course (Standard) conforming to NJDOT Section 409. Mixture Design as follows:
1. HMA Wearing Course, PG 64-22, 0.3 to <3 Million ESALs, 9.5 mm Mix, 1-1/2 inch depth, SRL-H.
- C. HMA Binder Course: Superpave Asphalt Mixture Design, HMA Binder Course (Standard) conforming to NJDOT Section 409.
- D. Cement Concrete Pavement: Conforming to NJDOT Section 501.
1. Reinforced.
 2. Plain.
 3. High early strength cement concrete (HES).
 4. Class AA cement concrete.

- E. Aggregate Surface: No. 2A Coarse Aggregate conforming to NJDOT Section 703.2

2.3 SHOULDER MATERIALS

- A. Paved Shoulders, Type 3: Conforming to NJDOT Section 653.2.
- B. Paved Shoulders, Type 4: Conforming to NJDOT Section 654.2, 6 inches thick after compaction.
- C. Paved Shoulders, Type 6: Conforming to NJDOT Section 656.2.
- D. Stabilized Shoulder:
 - 1. AASHTO No. 8 Aggregate: Conforming to NJDOT Section 703.2, Course Aggregate.

2.4 BITUMINOUS MATERIALS

- A. Asphalt Cement: PG 64-22 conforming to NJDOT Section 702.
- B. Bituminous Tack Coat: Class AE-T Emulsified Asphalt conforming to NJDOT Section 460.

2.5 MISCELLANEOUS MATERIALS

- A. Temporary Paving: Type 2-P Bituminous Stockpile Patching Material conforming to Section 484 of Bulletin 27.
- B. Calcium Chloride: Conforming to NJDOT Section 721.
 - 1. Shall not be permitted for dust control.
- C. Cement Concrete:
 - 1. For driveways provide Class AA Cement Concrete conforming to NJDOT Section 704.
 - 2. For curbs, gutters and sidewalks provide Class A Cement Concrete conforming to NJDOT Section 704.
 - 3. For driveways, curbs, gutters and sidewalks provide Class B (3000 psi.) Concrete as specified in Section 03 30 00.
- D. Bituminous Concrete Curb: Conforming to NJDOT Section 636.
- E. Guide Rail: Type 2-S without rubbing rail, conforming to NJDOT Section 620.
- F. Traffic Paint: Zone Marking Traffic Paint as manufactured by:
 - 1. M. A. Bruder & Sons.
 - 2. Or Equal.
- G. Traffic Paint: Conforming to NJDOT Section 962.2 (b).

- H. Pavement Sealer Coating: Provide a coal tar compound modified with an anionic latex emulsion and emulsified into a homogenous sealant type coating for complete coverages of paved surfaces.
 - 1. Pavement sealer shall meet or exceed the requirements of Federal Specification RP-355e and MIL-C-15203C.
 - 2. Acceptable Manufacturers:
 - a. SealMaster, Inc.; SealMaster Coal Tar Sealer with Top Tuff Latex Additive.
 - b. Or Equal.
 - 3. Mixing Water: Use potable water free from harmful soluble salts for mixing the sealer slurry. Water temperature at time of mixing shall have a minimum temperature of 50 degrees F.

2.6 PAVEMENT MIXES

- A. Composition of Mixtures: Provide binder and wearing course mixture composition conforming to requirements of NJDOT Section [401] and NJDOT Section [409].
 - 1. Establish a job-mix formula prior to beginning work without changing during progress of work except with Engineer's approval. Job-mixing tolerances not to permit acceptance of materials with gradations falling outside master ranges set in specified NJDOT Sections.
 - 2. Approved job-mix formula to fall within specification limits and be suitable for layer thickness and other conditions prevailing.
- B. Surface Treatment Design: Submit to the Engineer for review as per requirements of NJDOT Section 480.

PART 3 EXECUTION

3.1 PREPARATION

- A. Subsurface Preparation: Perform roadway grading and finish rolling just prior to subbase installation as previously specified in Section 31 22 16.13.
- B. Pavement Removal:
 - 1. Cut paving to neat lines equidistant from centerline of trench.
 - 2. Cut paving with a mechanical saw.
 - 3. Remove pavement to a width equal to Specified Maximum Trench Width as indicated in the Trench Width Tables detailed on the Drawings plus 2 feet and not less than 1 foot on each side of trench.
 - 4. In addition to requirements specified above, where street roadway paving consists of a concrete base course and a bituminous surface course, remove bituminous surface course for a width equal to Specified Maximum Trench Width plus 3 feet and not less than 18 inches on each side of trench width as excavated.
 - 5. On State Highways where pavement consists of a concrete base course and a bituminous surface course it is a requirement of New Jersey Department of Transportation that for longitudinal trenches, remove base and surface courses of pavement to closest longitudinal joints in pavement; and for transverse trenches where edge of trench is within 4 feet of a transverse joint

- in pavement, remove base and surface courses of pavement to transverse joint.
6. If pavement is removed or disturbed for a greater width without written authorization of Engineer, Owner will require Contractor to replace greater width pavement without compensation.
 7. Remove temporary paving and backfill to required depth for installation of permanent replacement pavement. No additional payment will be made for removing temporary pavement and backfill.
- C. Subgrade: Backfill and compact trenches in accordance with requirements of Section 31 23 33.
- D. Perform paving only after site grading, and trenching, have been completed and accepted by Engineer.
- E. Moisture content of subgrade material at time of compaction is not to be more than 2 percentage points above optimum moisture content.
- F. At joints between existing pavements and new paving work, cut and trim edges of existing pavements as approved by Engineer. Provide an application of Bituminous Tack Coat at locations where new bituminous paving joins existing bituminous paving.
- G. Surface Preparation of Existing Paving:
1. Prior to overlay paving, condition existing paving in accordance with NJDOT Section [401.3(g)] [409.3(g)].
 2. Prior to surface treatment application, condition existing paving in accordance with NJDOT Section 480.
- H. Patching Existing Paving:
1. Prior to overlay paving, patch potholes and other damaged areas in existing paving. Location and extent of pavement patching will be determined by Engineer.
 2. Prior to overlay paving, level low and depressed areas on roadways. Location and extent of leveling will be determined by Engineer.
 3. Prior to overlay paving, level low and depressed areas on roadways indicated in the Table following this Section.
 4. Thoroughly clean and remove loose material, dry and prime with a light coat of emulsified asphalt areas to be patched or leveled.
 5. Use HMA Binder course material placed by hand, spread with rakes, lutes, brooms or shovels to obtain uniform placement. Use hand operated vibratory compactor or similar equipment for compaction. Mechanical pavers or conventional power rollers may be used in areas requiring leveling when approved by Engineer.
 6. Cut square and vertical the edges of pavement to provide mechanical shoulder when patch exceeds 1 inch in depth.
- I. Milling of Bituminous Pavement Surface: Perform milling operation in accordance with NJDOT Section 491, to a depth of 1-1/2 inch depth, and to limits indicated on Drawings.

- J. Adjustment of Height of Gas and Water Service Boxes and Frames of Underground Structures:
 - 1. Adjust heights of gas and water service boxes, and frames of other underground utility structures, if existing within street to be overlaid. Adjust heights to proposed finish grade elevations of overlay paving well in advance of placing the paving.
 - 2. Make necessary arrangements with respective utility companies for adjustment of their service boxes and frames of underground structures.
 - 3. Do not proceed with overlay paving until heights of service boxes and frames of underground structures have been adjusted to satisfaction of Engineer.
 - 4. No separate or additional payment will be made for adjusting heights of service boxes, and frames of other underground structures.
- K. Painting Curbs: Prior to placing bituminous concrete overlay pavement, paint inside faces of existing curbs with a thin application of asphalt cement to provide a closely bonded, watertight joint.
- L. Tack Coat: Prior to placing bituminous concrete overlay pavement, apply a Bituminous Tack Coat consisting of a thin application of emulsified asphalt to existing paved surface at rate and in a manner as specified in NJDOT Section 460. Prior to applying tack coat, clean loose and foreign material from existing pavement surface.
- M. Construct joints of overlay pavement as specified in NJDOT Section [401.3 (k)] [409.3(k)].
- N. Prior to traffic line painting, clean surfaces free of dirt, sand, grease or other matter.

3.2 INSTALLATION (NEW PAVING)

- A. Subbase Construction: Install coarse aggregate Subbase in accordance with NJDOT Section 350. Install Subbase to after compaction thickness indicated on Drawings.
- B. Base Course Construction: Install Aggregate Base Course in accordance with NJDOT Section 310. Install Base Course to after compaction thickness indicated on Drawings.
- C. Bituminous Pavement Construction: Method of preparing mixture, placing mixture, compaction, and protection of in place bituminous concrete for paving to comply with NJDOT Section [401.3] [409.3]. Minimum thickness of bituminous concrete base course, binder course, and wearing course is indicated on Drawings.
- D. Aggregate Surface: Install aggregate surface in accordance with NJDOT Section 677. Install aggregate surface on prepared subgrade to after compaction thickness indicated on Drawings.

3.3 INSTALLATION (REPLACEMENT PAVING)

- A. Temporary Pavement:
1. State Highways: Install temporary pavement over areas where pavement has been removed. Install temporary paving to 2 inches thickness after compaction, with top surface flush with surface of adjacent paving. Temporary pavement in shoulders is the trench backfill.
 2. Streets Other Than State Highways: In event permanent pavement cannot be placed due to weather limitations specified previously under Project Conditions, provide a temporary pavement over areas where pavement has been removed. Install temporary paving to 2 inches thickness after compaction, with top surface flush with surface of adjacent paving. Temporary pavement in shoulders is the trench backfill.
- B. Permanent Pavement Replacement:
1. General:
 - a. Method of preparing mixture, placing mixture, compaction, and protection of in-place bituminous concrete for paving to comply with NJDOT Section [305.3 and NJDOT Section 401.3] [NJDOT Section 309.3 and NJDOT Section 409.3].
 - b. Location of types and thicknesses of replacement pavements are as indicated on Drawings. Pavement thicknesses indicated are compacted thicknesses.
 2. Plain Cement Concrete Base Course: Construct in accordance with requirements of NJDOT Section 301.
 - a. Base Course: Consisting of High Early Strength (HES) or Class A cement concrete equal in thickness to original pavement base, or a minimum of 8 inches to subgrade materials.
 - b. Reinforcement: If trench exceeds four feet in width, or otherwise required, provide No. 6 deformed reinforcing bars installed in concrete base course, placed at 6 inch centers with 2 inch clearance at each end and a 3 inch clearance on bottom.
 - c. Provide Bituminous Tack Coat over cured cement concrete surface per requirements of NJDOT Section 460.
 3. Bituminous Concrete Base Course (BCBC): Construct in accordance with requirements of NJDOT Section 305.
 - a. Where roadways receive trench restoration only, install Bituminous Concrete Base Course with top surface below surface of adjacent pavement a distance equal to thickness of replacement surface course pavement.
 - b. Where roadways receive overlay pavement, install Bituminous Concrete Base Course with top surface flush with surface of adjacent pavement.
 4. HMA Base Course: Construct in accordance with requirements of NJDOT Section 309.
 - a. Where roadways receive trench restoration only, install HMA Base Course with top surface below surface of adjacent pavement a distance equal to thickness of replacement surface course pavement.
 - b. Where roadways receive overlay pavement, install HMA Base Course with top surface flush with surface of adjacent pavement.

5. Bituminous Binder Course (ID-2): Construct in accordance with requirements of NJDOT Section 421.
 - a. Install binder course with top surface below surface of adjacent pavement a distance equal to thickness of replacement wearing course pavement.
 6. HMA Binder Course: Construct in accordance with requirements of NJDOT Section 409.
 - a. Install HMA Binder Course with top surface below surface of adjacent pavement a distance equal to thickness of replacement wearing course pavement.
 7. Bituminous Wearing Course (ID-2): Construct in accordance with requirements of NJDOT Section 420.
 - a. Install wearing course with top surface flush with surface of adjacent pavement.
 8. HMA Wearing Course: Construct in accordance with requirements of NJDOT Section 409.
 - a. Install HMA Wearing course with top surface flush with surface of adjacent pavement.
 9. Cement Concrete Pavement: Construct in accordance with requirements of NJDOT Section 501.
 - a. Replace cement concrete pavement according to details in NJDOT Publication #72, RC Series, RC-26, Concrete Pavement Rehabilitation Sheet [] of []. Drawings indicate location of joints and installation of expansion tie bolts. A copy of Drawing RC-26 is included as, Exhibit [] in Appendix.
 - b. Following concrete curing, apply Bituminous Tack Coat in accordance with NJDOT Section 460.
 - c. After tack coat has cured, install bituminous binder and wearing course to conform to existing street binder and wearing courses.
 10. Use Asphalt Cement material to seal joints in wearing courses as specified in NJDOT Section [401.3 (k)] [409.3(k)].
 11. Bituminous Surface Treatment: Construct in accordance with requirements of NJDOT Section 480.
- C. Shoulder Restoration:
1. Paved Shoulder Type 3:
 - a. Trench backfilled to elevation of adjacent existing shoulder surface.
 - b. Grade, shape and roll entire width of disturbed shoulder area adjacent to trench. Replace aggregate removed.
 - c. Apply Bituminous Prime Coat to full width of shoulder, in accordance with requirements of NJDOT Section 653.3 (b).
 - d. After prime coat curing, apply Bituminous Surface Treatment in two separate applications in accordance with requirements of NJDOT Section 653.3 (c).
 - e. Construct successive layers of Bituminous Surface Treatment until finished surface, after compaction, is flush with adjacent finished pavement.
 2. ID-2 Paved Shoulder:
 - a. Trench backfill to elevation of adjacent existing shoulder surface.

- b. Grade, shape and roll entire width of disturbed shoulder area adjacent to trench. Replace aggregate removed.
 - c. Apply ID-2 wearing course to full width of shoulder in accordance with requirements of NJDOT Section 420.
 3. Paved Shoulder Type 4:
 - a. Trench backfill to subgrade of base as specified in Section 31 23 33.
 - b. Excavate existing shoulder to subgrade of base for full width.
 - c. Install Aggregate Base as specified in NJDOT Section 654.3 over entire width of shoulder.
 - d. Grade, shape and roll entire width of disturbed shoulder to receive base. Replace aggregate removed.
 - e. Apply Prime Coat and Bituminous Surface Treatment to full width of shoulder as specified in NJDOT Section 654.3.
 4. Stabilized Shoulder:
 - a. Trench backfill to surface of adjacent shoulder.
 - b. Grade, shape and roll entire width of shoulder. Replace surface stone removed.
 - c. Apply Bituminous Seal Coat as specified in NJDOT Section 470.3 to entire width of shoulder.
 5. Paved Shoulder Type 6:
 - a. Trench backfill to subgrade of base as specified in Section 31 23 33.
 - b. Install Bituminous Concrete Base Course with top surface flush with surface of adjacent pavement.
 - c. Apply Bituminous Surface Treatment for full width of shoulder.
 - d. Construction methods per requirements of NJDOT Section 656 and RC-25 of Publication #72. A copy of Drawing RC-25 is included as an Exhibit in Appendix.
- D. Unimproved Roads: Backfill as specified in Section 31 23 33 with exception that top 6 inches of backfill be Select Granular Material (2RC). Grade, shape and roll entire width of road.
1. Unimproved Roadway Surface Restoration: In addition to restoration specified above, provide an aggregate surface course, graded, shaped and rolled, of a width and depth as indicated on Drawings.
- E. Cement Concrete Curbs: Replace curbs to shape, thickness, workmanship and finish as original curb unless otherwise required by Engineer. Construction methods as specified in NJDOT Section 630.
- F. Bituminous Concrete Curb: Construct in accordance with requirements of NJDOT Section 636.
- G. Cement Concrete Driveway: Backfill as specified in Section 31 23 33. Replace cement concrete to workmanship, thickness and finish as original driveway unless otherwise required by Engineer.
- H. Cement Concrete Sidewalk: Replace cement concrete sidewalk removed or disturbed with a 4 inch thick crush stone bed and a 4 inch thick concrete surface;

width to match existing. Construct bed and concrete surface as specified in NJDOT Section 676.

- I. Bituminous Concrete Driveway: Provide a 2 inch thick wearing course of ID-2 bituminous concrete with top surface flush with top surface of adjacent existing paving.
- J. Bituminous Concrete Walk: Consists of an Aggregate Base Course and a Bituminous Concrete Wearing Course. Provide Aggregate Base Course not less than 6 inches thick after compaction and top surface not less than 2 inches below surface of adjacent existing paving. Provide Bituminous Concrete Wearing Course consisting of 2 inch thick ID-2 wearing course. Top surface of wearing course to be flush with surface of adjacent existing paving.
- K. Stone Driveway: Restore to a condition equal to its original undisturbed condition using type and quality of materials as that of particular driveway restored.
- L. State Highway Guide Rail: Replace guide rail damaged or removed during construction.
 - 1. Provide type and quality of guide rail material as existing.
 - 2. Salvage and reuse of guide rail permitted for reconstruction; however, Engineer will inspect guide rail after removal and if determined unsuitable for reuse, replace with new guide rail.
 - 3. Perform work to requirements and approval of New Jersey Department of Transportation.
- M. Dust Control: Provide effective dust control by sprinkling water, by use of calcium chloride or by other methods approved by Engineer. Use dust control measures where, when and in a manner required by Engineer.

3.4 INSTALLATION (OVERLAY PAVING)

- A. Limits of Overlay Paving:
 - 1. Provide overlay pavement to limits indicated on the Drawings, and to such additional limits as required by New Jersey Department of Transportation, other agencies having jurisdiction, or Engineer.
 - 2. State Highways: Extend overlay paving 25 feet beyond pavement cut back edge at terminal manholes or transverse trenches. Provide overlay paving for full roadway width or one-half roadway width as indicated on Drawings.
 - 3. State Highways: At locations determined by Engineer, when distance between transverse crossings of roadway is less than 100 feet, provide a full width overlay to a point 25 feet beyond cut back edge of transverse trench.
 - 4. Roadways Other Than State Highways:
 - 5. Roadways to receive overlay pavement are indicated in the Table following this Section.
- B. Overlay Paving, Bituminous Wearing Course ID-2:
 - 1. Use materials, composition of mixture and methods to construct the bituminous concrete overlay paving conforming to all applicable requirements of NJDOT Section 420 for Bituminous Wearing Course ID-2.

2. The minimum thickness of the overlay pavement after compaction to be as indicated on Drawings. The contours of the surface of the overlay pavement may be the same as the existing street pavement.
 3. Install a leveling course of binder course material in depressions if necessary.
 - a. Include the cost of this extra thickness in the cost of the overlay paving. There will be no additional payment made to the Contractor for installing any leveling course.
- C. Overlay Paving, HMA Wearing Course:
1. Use materials, composition of mixture and methods to construct the superpave asphalt overlay paving conforming to all applicable requirements of NJDOT Section 409 for HMA Wearing Course .
 2. The minimum thickness of the overlay pavement after compaction to be as indicated on Drawings. The contours of the surface of the overlay pavement may be the same as the existing street pavement.
 3. Install a leveling course of binder course material in depressions if necessary.
 - a. Include the cost of this extra thickness in the cost of the overlay paving. There will be no additional payment made to the Contractor for installing any leveling course.
- D. Overlay Paving, Bituminous Surface Treatment: Use materials and methods to construct the bituminous surface treatment conforming to all applicable requirements of NJDOT Section 480.
- E. Shoulders:
1. Reconstruct existing shoulders adjoining overlaid State Highways to provide support for the new overlay pavement.
 2. Reconstruct shoulders of the type specified previously.

3.5 APPLICATION

- A. General:
1. Strictly follow paint manufacturer's label instructions for mixing, thinning, proper spreading rate and drying time. Do not apply film thickness less than manufacturer's recommendations or exceed manufacturer's area coverage per gallon recommendations.
 2. If material has thickened or needs diluted for application, build up coating to film thickness achieved with undiluted material. Do not use thinner to extend coverage of paint.
 3. Regardless of surface, it is painter's responsibility to achieve a suitable finish by decreasing coverage rate or by applying additional coats of paint.
- B. Roadway Traffic Lines and Markings: Apply in accordance with NJDOT Section 962.
- C. Parking Area Traffic Lines and Markings: Striping consists of white 4 inch wide painted lines of length and spacing indicated on Drawings. Paint lines accurately with sharp, clearly defined edges. Paint solid colored areas free of skips and holidays. Make linework straight and uniformly spaced.

- D. Provide satisfactory barrier cones for at least 30 minutes, or until paint is dry and track free from vehicular traffic. Repaint marked or damaged areas, as directed by Engineer.

3.6 MAINTENANCE

- A. Continuously maintain temporary paving without additional compensation until replaced with permanent paving.
- B. Maintain without additional compensation, work of this Section for a period of twelve (12) months after date of Owner's approval of Completion Certificate issued by Engineer, including repair or removal and replacement of work that failed or has been damaged or where surface depressions have developed. Materials and methods used to repair or replace work to conform to applicable requirements of this Section.
- C. Should Contractor fail to perform required maintenance or repairs within three days after written notice from Owner or Engineer, Owner may perform maintenance or repairs and deduct cost from monies due or to become due Contractor.

END OF SECTION

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