
SECTION 5
SPECIFICATIONS

SECTION 011100 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 LOCATION OF THE PROJECT

- A. The project is located on E. 347th Street between Eastlawn Drive and Stevens Boulevard in the City of Eastlake, Ohio.

1.2 PROJECT DESCRIPTION

- A. The project consists of replacing concrete pavement, aprons, and curb ramps; casting adjustment; casting replacement, as directed; curb drain; pavement surface treatment and lawn restoration.

1.3 SPECIFICATIONS

- A. In general, these Specifications describe the work to be performed by the various trades, other than work specifically excluded. It shall be the responsibility of Contractors and Subcontractors to perform all work incidental to their trade, whether or not specific mention is made of each item, unless such incidentals are included under another Item.
- B. It is advised that all Contractors and Subcontractors familiarize themselves with the contents of the complete Specifications, particularly for the trades preceding, following, related or adjacent to their work.

1.4 DRAWING SCHEDULE

- A. The work to be done under these Contracts is shown on the following Drawings:

<u>Title</u>	<u>Sheet No.</u>
Title Sheet	1
General Notes	2
Maintenance of Traffic	3
Plan and Profile	4-5
Typical Section and Construction Details	6-9
Intersection Details	10
Erosion and Sediment Control	11
Survey Control Plan	12

1.5 QUANTITY WORKSHEET

- A. Attached is a listing of the estimated quantities for this project.

END OF SECTION 011100

OWNER: CITY OF EASTLAKE

PROJECT #23-2528

EAST 347th STREET PAVEMENT RECONSTRUCTION

QUANTITY WORKSHEET

width	25.0	25.0	
approx. length	447.0	359.5	806.5
Area(s.y.)	1320.1	1017.5	2337.6

R E F #	ODOT ITEM #	DESCRIPTION (QUANTITIES) FROM:	UNITS	(QUANTITIES) FROM:		EXTRA QUANTITY	ESTIMATED TOTAL QUANTITY
				SHT 3	SHT 4		
				1	103		
2	103	BONDS AND INSURANCES, AS PER PLAN	LUMP	0.6	0.4	0.0	1.0
3	202	EXCAVATION AND REMOVAL OF EXISTING PAVEMENT, CURB, & BASE, A.P.P.	LUMP	0.6	0.4	0.0	1.0
4	204	EXCAVATION OF SUBGRADE AND EMBANKMENT WITH GRANULAR MATERIAL, CCS, A. P. P., CONTINGENCY, AS DIRECTED	CU YD	110.0	84.8	5.2	200.0
5	204	GEOTEXTILE FABRIC, A.P.P. , 712.09 TYPE D	SQ YD	1320.1	1017.5	2.4	2340.0
6	304	AGGREGATE BASE, AS PER PLAN	CU YD	146.7	113.1	0.3	260.0
7	450	SPECIAL - CONCRETE SEALING SURFACE TREATMENT, SINAK, AS PER PLAN	SQ YD	1464.0	1163.0	23.1	2650.0
8	452	6" PLAIN CONCRETE DRIVES & APRONS, CLASS QC MS, INCL REMOVAL., A.P.P.	SQ YD	117.1	145.5	7.4	270.0
9	452	8 INCH NON-REINFORCED CONCRETE PAVEMENT, CLASS QC MS, INCLUDING FIBER REINFORCING, AS PER PLAN	SQ YD	1320.1	1017.5	2.4	2340.0
10	605	6 INCH SHALLOW PIPE UNDERDRAINS WITH GEOTEXTILE FABRIC, AS PER PLAN	LIN FT	894.0	719.0	7.0	1620.0
11	608	4 INCH CONCRETE WALK, INCLUDING REMOVAL, AS PER PLAN	SQ FT	158.0	0.0	42.0	200.0
12	608	CURB RAMP, AS PER PLAN - ADDITIONAL LABOR FOR FORMING/POURING AND TRUNCATED DOME PLATE - SF OF CONCRETE PAID SEPARATELY	EACH	2.0	0.0	0.0	2.0
13	608	6 INCH CURB RAMP, INCLUDING REMOVAL, AS PER PLAN	SQ FT	83.0	0.0	17.0	100.0
14	611	CATCH BASIN ADJUSTED TO GRADE, METHOD D.1 (brick), AS PER PLAN	EACH	4.0	4.0	0.0	8.0
15	611	CATCH BASIN PARTIALLY RECONSTRUCTED TO GRADE, AS PER PLAN	VERT. FT	0.0	0.0	5.0	5.0
16	611	MANHOLE ADJUSTED TO GRADE, METHOD D.1 (brick), AS PER PLAN	EACH	3.0	1.0	0.0	4.0
17	611	SPECIAL - GAS VALVE BOX ADJUSTED TO GRADE	EACH	0.0	0.0	1.0	1.0
18	611	SPECIAL - MISCELLANEOUS METAL	POUND	3408.0	1844.0	48.0	5300.0
19	612	ASPHALT/CONCRETE BUFFER STRIP, AS PER PLAN	SQ YD	25.0	0.0	0.0	25.0
20	614	MAINTAINING TRAFFIC, AS PER PLAN	LUMP	0.6	0.4	0.0	1.0
21	624	MOBILIZATION	LUMP	0.6	0.4	0.0	1.0
22	638	VALVE BOX ADJUSTED TO GRADE, AS PER PLAN	EACH	0.0	0.0	2.0	2.0
23	638	SERVICE BOX ADJUSTED TO GRADE, AS PER PLAN	EACH	0.0	0.0	2.0	2.0
24	643	STOP LINE	LIN FT	19.0	19.0	0.0	38.0
25	659	LAWN RESTORATION INCL. LINEAL GRADING & TOPSOIL, AS PER PLAN	LUMP	0.6	0.4	0.0	1.0
26	832	TEMPORARY SEDIMENT AND EROSION CONTROL, AS PER PLAN	LUMP	0.6	0.4	0.0	1.0
27	999	CONTINGENCY/DISCRETIONARY ALLOWANCE	LUMP	0.0	0.0	1.0	1.0

SECTION 011419 – USE OF SITE

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor will be allowed the use of as much of the site designated for the improvements as is necessary for his operation.

1.2 USE OF STREETS

- A. During the progress of the work, the Contractor shall make ample provisions for both vehicle and pedestrian traffic on any public street and shall indemnify and save harmless the Owner from any expense whatsoever due to their operations over said streets. The Contractor shall also provide free access to all the fire hydrants, water, and gas valves located along the line of his work. Gutters and waterways must be kept open or other provisions made for the removal of storm water. Street intersections may be blocked only one-half at a time, and the Contractor shall lay and maintain temporary driveways, bridges and crossings, such as in the opinion of the Engineer are necessary to reasonably accommodate the public.
- B. In the event of the Contractor's failure to comply with these provisions, the Owner may cause the same to be done, and may deduct the cost of such work from any monies due the Contractor under this Agreement, but the performance of such work by the Owner at its instance shall serve in no way to release the Contractor from his general or particular liability for the safety of the public or the work.
- C. The Contractor shall repair at no cost to the Owner, all existing roads, parking areas, grassed areas that are damaged due to the execution of his work. The Contractor shall remove daily all mud, soil and debris that may be tracked onto existing streets, drives, or walks by his equipment or that of subcontractors or suppliers.

1.3 RIGHTS-OF-WAY

- A. Whenever it is required to perform work within the limits of public or private property or in rights-of-way, such work shall be done in conformity with all agreements between the Owner and the owners of such. Care shall be taken to avoid injury to the premises entered, which premises shall be left in a neat and orderly condition by the removal of rubbish and the grading of surplus materials, and the restoration of said public or private property to the same general conditions as pertained at the time of entry for work to be performed under this contract.
- B. The Contractor shall not (except after consent from the proper parties) enter or occupy with men, tools or equipment, any land outside the rights-of-way or property of the Owner.

- C. When the Contractor performs construction within 10 ft. of a right-of-way or easement line, he shall place tall stakes properly identified at points of change in width or direction of the right-of-way or easement line and at points along the line so that at least two stakes can be seen distinctly from any point on the line.

1.4 PROTECTING EXISTING BUILDINGS, STRUCTURES AND ROADWAYS

- A. The Contractor shall, at his own expense, shore up and protect any buildings, roadways, utilities or other public or private structures which may be encountered or endangered in the prosecution of the work, and that may not be otherwise provided for, and he shall repair and make good any damages caused to any such property by reason of his operations. All existing fences removed due to the prosecution of the work shall be replaced by the Contractor. No extra payment will be made for said work or material, but the cost of this work must be included in the price stipulated for the work to be done under this contract.

1.5 SITE FACILITIES

- A. The Contractor shall furnish and place sufficient quantities of portable toilet facilities at locations convenient for use by the Contractor's personnel, Subcontractors, the Engineer, and the Owner.

1.6 RESTORATION

- A. The contractor shall restore all areas per the plans and specifications and if not specified, at least to the condition existing prior to the start of work.

END OF SECTION 011419

SECTION 011423 - ADDITIONAL WORK, OVERTIME

PART 1 - GENERAL

1.1 NIGHT, SUNDAY AND HOLIDAY WORK

- A. No work will be permitted at night, Sunday or legal holidays except as noted on the plans or in the case of emergency and then only upon written authorization of the Engineer. Where no emergency exists, but the Contractor feels it advantageous to work at night, Sunday or legal holidays, the Contractor shall notify the Engineer at least two (2) days in advance, requesting written permission. Any work performed during the absence of the Engineer will be done at the Contractor's risk and responsibility and may be subject to rejection upon later inspection.

END OF SECTION 011423

SECTION 012513 – PRODUCT SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 MATERIALS AND EQUIPMENT

- A. In the specifications and on the Engineer's drawings, are specified and shown certain pieces of equipment and materials deemed most suitable for the service anticipated. This is not done to eliminate other equipment and materials equally as good and efficient. The Contractor shall prepare his bid on the particular materials and equipment specified. Following the award of the contract, should the Contractor desire to use other equipment and materials, he shall submit to the Owner a written request for such change and state the advantage to the Owner and the savings or additional cost involved by the proposed substitution. The determination as to whether or not such change will be permitted rests with the Owner and the Engineer.

END OF SECTION 012513

SECTION 013119 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 PRECONSTRUCTION MEETING

- A. Prior to the Contractor beginning any work on the project, the Owner will schedule and hold a preconstruction meeting to discuss all aspects of the contract work.
- B. The Contractor shall be present and be prepared to comment in detail on all aspects of his work.
- C. The Contractor shall bring to the preconstruction meeting a proposed construction progress schedule, erosion control plan, quality control program, concrete mix designs, asphalt mix designs (JMF), etc. Approval of each by the Engineer is required prior to the start of any work.
- D. Included in the construction progress schedule shall be an implementation sequence of the proposed erosion control efforts required by the contract.

1.2 PROGRESS MEETINGS

- A. Monthly progress meetings will be held at a location to be determined by the Owner on a regularly scheduled day mutually convenient to the Owner, Contractor, and Engineer.
- B. The Contractor shall provide an updated construction progress schedule and be prepared to comment in detail on all aspects of his work.

END OF SECTION 013119

SECTION 013216 – CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 PROGRESS SCHEDULE

- A. Immediately after signing the Contract, the General Construction Contractor shall prepare a graphic progress schedule, indicating the work to be executed during each month and the rate of expected progress to secure completion on the agreed-upon completion date. The progress schedule shall be approved by the Engineer and Owner prior to starting work on the site. Copies of such graphic progress charts, upon which has been indicated the actual progress, shall be furnished to the Engineer with each requisition for payment.

This progress schedule must follow these general time frames (may vary with project):

1. Chip seal, paving fabric and/or the leveling course must start within 7 calendar days from the date of milling.
 2. Casting adjustments and/or curb replacements must start within 7 calendar days from the completion of the chip seal, intermediate course and/or fabric.
 3. Surface course asphalt concrete must begin installation within 7 calendar days from the completion of the casting adjustments and/or curb replacement.
 4. Traffic paint, temporary or permanent must be installed within a time period as deemed adequate and desirable for each location.
- B. Should the rate of progress fall materially behind the scheduled rate of progress, and unless the delay is authorized by the Engineer, each offending Contractor shall furnish additional labor, work overtime, or take other necessary means required for completion of the work on the scheduled date. No additional compensation beyond the set Contract price shall be paid for action taken or overtime expense incurred in maintaining scheduled progress.

END OF SECTION 013216

SECTION 013223.02 – SURVEY AND LAYOUT DATA

PART 1 - GENERAL

1.1 REFERENCE POINTS

- A. The Owner shall provide engineering surveys for construction to establish reference points which in his judgment are necessary to enable the Contractor to proceed with the work. The Contractor shall be responsible for surveying and laying out the work and shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of the Engineer. He shall report to the Engineer whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations. The Contractor shall replace and accurately relocate all reference points so lost, destroyed or moved.

1.2 LAYOUT OF WORK

- A. The Contractor shall lay out his work and be responsible for correct locations, elevations and dimensions of all work executed by him under this Contract. The Contractor must exercise proper precautions to verify the figures shown on the Drawings before laying out the work and will be held responsible for any error resulting from his failure to exercise such precaution. The Contractor shall employ a competent surveyor to establish lines and grades to insure the new construction aligns with any existing work.

END OF SECTION 013223

SECTION 013236 – VIDEO MONITORING AND DOCUMENTATION

PART 1 - GENERAL

1.1 SCOPE

- A. Provide all labor, materials, equipment, and services, and perform all operations necessary to furnish to the Owner a complete color audio-video record on a USB Flash Drive of the surface features within the proposed construction zone of influence. This record shall include, but not be limited to, all audio-video USB Flash Drives, storage cases, video logs, and indexes. The purpose of this coverage shall be to accurately document the pre-construction condition of these surface features.

1.2 QUALIFICATIONS

- A. The color audio-video documentation shall be done by a responsible commercial firm known to be skilled and regularly engaged in the business of pre-construction color audio-video documentation. The firm shall furnish such information as the Owner deems necessary to determine the ability of that firm to perform the work in accordance with the Contract specifications.

1.3 PRODUCTS

- A. The color audio-video recording delivered to the Owner shall be on a high-quality USB Flash Drive.

END OF SECTION 013236

SECTION 013319.01 - FIELD TEST REPORTING
- AGGREGATE, SOILS, CONCRETE AND ASPHALT

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall be responsible for the quality of all materials incorporated into the project work and shall be responsible for all costs of testing and certification of same. The Contractor shall provide the City Engineer a list of three (3) local qualified firms for the City to select from to be the Contractor's testing firm.
- B. The Contractor shall provide the engineer with a Quality Control Plan in which his testing methods/procedures are defined. Said Plan shall meet with the approval of the Engineer and include identification of laboratories, types of testing, and the tentative amount and scheduling of each.

All certification of tests and/or gradations for material to be utilized in the work and all quality control testing shall be performed by an independent laboratory (not affiliated with, owned by, or managed by the Contractor). The laboratory shall be accredited by the AASHTO Materials Reference Laboratory for the type of testing performed.

- C. The Owner may perform field Quality Assurance testing; however, such testing shall not relieve the Contractor from the responsibility of Quality Control testing or from supplying certificates from manufacturers or suppliers to demonstrate compliance with the specifications. It is intended that the testing by the Contractor and the Owner be complimentary toward a quality project; however, the Contractor may not assume the Owner will test or that any tests will be done in lieu of the Contractor's own Quality Control testing. In the same sense, the Contractor may not rely on Owner Quality Assurance testing as a basis of acceptance or approval of his work nor may any Owner-performed testing be reflected in his submitted plan.

1.2 TEST CRITERIA

- A. The following tests at a minimum shall be included with the Contractor's Quality Control Plan in accordance with the specifications:
 - 1. Aggregates
 - a. For each material and/or different source, the laboratory shall perform soundness, gradation, and other tests for all parameters specified. Aggregates incorporated into concrete or asphalt mixes shall also be tested for moisture content daily.

2. **Compaction Tests**
 - a. Compaction tests or field density tests shall be taken on all embankment, trench backfill, subgrade, and subbase materials.
 - b. Minimum testing shall be as follows:
Embankment testing shall be at least one (1) test/5,000 SF of each lift; Trench backfill testing shall be at least one (1) test/50 LF of each lift; Subgrade and/or subbase testing shall be at least one (1) test/200 LF of pavement or 5,000 SF of slabs; subject to greater frequency due to soil conditions or Engineer's direction.
 - c. Proctors or relative density tests shall be performed as often as necessary for the differing soils or granular materials utilized. Proctors shall be run with a minimum of 5 points. Test reports shall show the wet (bulk) weight, dry weight, wet (bulk) density, dry density, moisture content weight and moisture content percentage. Both the dry curve and the wet curve shall be plotted.
3. **Concrete Mix Design**
 - a. For each type of concrete, the laboratory shall perform the necessary mix design providing all test data as required by the specifications.
4. **Concrete Field and Laboratory Tests**
 - a. The laboratory shall cast concrete cylinders and test beams:
 1. One set of four cylinders per 50 CY with a minimum of two sets per day. The cylinders shall be broken: one at 7 days, two at 28 days, one at 56 days, unless otherwise directed by the Engineer.
 2. One beam per 50 CY with a minimum of two beams per day.
 - b. Temperature and unit weight shall be run on fresh concrete at intervals sufficient for the type of structure being placed and a minimum of once per day. Bulk weight, bucket weight, (tare), net weight, bucket factor (bucket volume) and unit weight shall be recorded on the fresh concrete report. Show all batch weights for yield calculations. Slump and air content tests shall be taken a minimum of one test per 20 CY and at least once per day.
 - c. All field and laboratory testing shall be performed by technicians certified by the American Concrete Institute (ACI) for the type of testing performed.
 - d. Initial cure of all cylinders shall be in a temperature controlled cure box or temperature controlled water tank with a hi-low thermometer. Hi-low temperature readings shall be recorded on the fresh concrete report.
5. **Asphalt Mix Design**
 - a. For each type of asphalt mix, submit job mix formula (JMF) prepared by an ODOT pre-qualified laboratory from tests performed on the aggregates proposed for use.
 - b. Sample and test for gradation and bitumen content per ODOT 441.

1.3 LABORATORY REPORTS

- A. Reports of laboratory and field tests will be distributed to the Engineer, Owner, and Suppliers within 24 hours of completion.

END OF SECTION 013319.01

SECTION 013323 - SHOP DRAWINGS AND SUBMITTALS

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor shall submit detailed drawings, acceptable catalog data, specifications and material certifications for all equipment and materials specified or required for the proper completion of the work.
- B. The intent of these items is to demonstrate compliance with the design concept of the work and to provide the detailed information necessary for the fabrication, assembly and installation of the work specified. It is not intended that every detail of all parts of manufactured equipment be submitted, however sufficient detail will be required to ascertain compliance with the specifications and establish the quality of the equipment proposed.

Shop Drawings shall be sufficiently clear and complete to enable the Engineer and Owner to determine that items proposed to be furnished conform to the specifications and that items delivered to the site are actually those that have been reviewed.

- C. It is emphasized that the Engineer's review of Contractor's submitted data is for general conformance to the contract drawings and specifications but subject to the detailed requirements of drawings and specifications. Although the Engineer may review submitted data in detail, such review is an effort to discover errors and omissions in Contractor's drawings. The Engineer's review shall in no way relieve the Contractor of his obligation to properly coordinate the work and to Engineer the details of the work in such manner that the purposes and intent of the contract will be achieved. Such review by the Engineer shall not be construed as placing on him or on the Owner any responsibility for the accuracy and for proper fit, functioning or performance of any phase of the work included in the contract.
- D. Shop Drawings shall be submitted in proper sequence and with due regard to the time required for checking, transmittal and review so as to cause no delay in the work. The Contractor's failure to transmit appropriate submittals to the Engineer sufficiently in advance of the work shall not be grounds for time extension.
- E. The Contractor shall submit Shop Drawings for all fabricated work and for all manufactured items required to be furnished in the Contract in accordance with the General Provisions and as specified herein. Shop Drawings shall be submitted in sufficient time to allow at least twenty-one (21) calendar days after receipt of the Shop Drawings from the Contractor for checking and processing by the Engineer.
- F. It is the responsibility of each Prime Contractor to furnish to all other Prime Contractors and especially the General Construction Contractor reviewed Shop Drawings for guidance in interfacing the various trades; i.e. sleeves, inserts, anchor bolts, terminations, and space requirements.
- G. No work shall be performed requiring Shop Drawings until same have been reviewed by Engineer.

- H. Accepted and reviewed Shop Drawings shall not be construed as approval of changes from Contract plan and specification requirements.
- I. The Engineer will review the first and second Shop Drawing item submittals at no cost to the Contractor. Review of the third submittal and any subsequent submittal will be at the Contractor's expense. Payment will be deducted from the Contract amount at a rate of 2.8 times direct labor cost plus expenses.

1.2 SUBMITTAL PROCEDURE

- A. All required submissions shall be made to the Engineer by the Prime Contractor(s) only. Any data prepared by subcontractors and suppliers and all correspondence originating with subcontractors, suppliers, etc., shall be submitted through the Contractor.
- B. Contractor shall review and approve all Shop Drawings prior to submission. Contractor's approval shall constitute a representation to Owner and Engineer that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or assumes full responsibility for doing so, and that Contractor has reviewed or coordinated each Shop Drawing or sample with the requirements of the work and the Contract Documents.
- C. Submittal Preparation: Mark each submittal with a permanent label or page for identification. Provide the following information on the label for proper processing and recording of action taken:
 - 1. Location
 - 2. Project Name
 - 3. Contract
 - 4. Name and Address of Engineer/Architect
 - 5. Name and Address of Contractor
 - 6. Name and Address of Subcontractor
 - 7. Name and Address of Supplier
 - 8. Name of Manufacturer
 - 9. Number and Title of appropriate Specification Section
 - 10. Drawing Number and Detail References, as appropriate.
 - 11. Submittal Sequence or Log Reference Number.
 - a. Provide a space on the label for the Contractor's review and approval markings and a space for the Engineer's "Action Stamp".
- D. Each Shop Drawing, sample and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature

Date

Company

- E. Shop Drawings shall be submitted in not less than six (6) copies to the Engineer at the address specified at the Preconstruction Conference. Single mylar or sepia reproducible copies of simple Shop Drawings may be submitted with prior approval of the Engineer.
- F. At the time of each submission, Contractor shall in writing identify any deviations that the Shop Drawings or samples may have from the requirements of the Contract Documents.
- G. Drawings shall be clean, legible and shall show necessary working dimensions, arrangement, material finish, erection data, and like information needed to define what is to be furnished and to establish its suitability for the intended use. Specifications may be required for equipment or materials to establish any characteristics of performance where such are pertinent. Suitable catalog data sheets showing all options and marked with complete model numbers may, in certain instances, be sufficient to define the articles which it is proposed to furnish.

1.3 REVIEW PROCEDURE

- A. Engineer will review with reasonable promptness all properly submitted Shop Drawings. Such review shall be only for conformance with the design concept of the Project and for compliance with the information given in the plans and specifications and shall not extend to means, methods, sequences, techniques or procedures of construction or to safety precautions or programs incident thereto.
- B. The review of a separate item as such will not constitute the review of the assembly in which the item functions. The Contractor shall submit entire systems as a package.
- C. All Shop Drawings submitted for review shall be stamped with the Engineer's action and associated comments.
- D. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Engineer will review each submittal, mark to indicate action taken, and return accordingly. Compliance with specified characteristics is the Contractor's responsibility.

Action Stamp: The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. If Shop Drawings are found to be in general compliance, such review will be indicated by marking the first statement.
 2. If only minor notes in reasonable number are needed, the Engineer will make same on all copies and mark the second statement. Shop Drawings so marked need not be resubmitted.
 3. If the submitted Shop Drawings are incomplete or inadequate, the Engineer will mark the third statement, request such additional information as required, and explain the reasons for revision. The Contractor shall be responsible for revisions, and/or providing needed information, without undue delay, until such Shop Drawings are acceptable. Shop Drawings marked with No. 3 shall be completed resubmitted.
 4. If the submitted Shop Drawings are not in compliance with the Contract Documents, the Engineer will mark the fourth statement. The Contractor will be responsible to submit a new offering conforming to specific products specified herein and/or as directed per review citations.
- E. No submittal requiring a Change Order for either value or substitution or both, will be returned until the Change Order is approved or otherwise directed by the Owner.

END OF SECTION 013323

SECTION 013326 – PRODUCT TESTING AND CERTIFYING

PART 1 - GENERAL

1.1 QUALITY OF MATERIALS

- A. Where the specifications call for mill or shop tests, the Contractor shall furnish duplicate copies of attested manufacturer's certificates showing details of quality or performance sufficient to demonstrate conformity to contract requirements. Mill, shop or witness tests shall be subject to view by the Engineer's representative, but the Engineer's representation shall not relieve the Contractor from the necessity of furnishing certificates specified. The Engineer shall be notified by the Contractor in writing, sufficiently in advance of the time of making tests, so that proper arrangements may be made. Waiving of witness of tests by the Engineer may be in writing only by the Engineer. All costs for travel, lodging, food and transportation that are necessary for the Engineer's representative and the Owner's representative to attend witness tests shall be included in the Contractor's bid for those item(s) specifically designated as being subject to witness testing.
- B. Unless otherwise specified, all materials, equipment and articles shall be erected, installed, applied, or connected, used, cleaned and conditioned in accordance with the printed instructions and directions of the manufacturer.
- C. The installation shall be so made that its several component parts will function together as a workable system. It shall be complete with all accessories necessary for its operation and shall be left with all equipment properly adjusted and in working order.
- D. The work shall be executed in conformity with the best practice and so as to contribute to efficiency of operation, minimum maintenance, accessibility and sightliness. It shall also be executed so that the installation will conform and accommodate itself to the building structure, its equipment and usage.
- E. Whenever in the contract documents a particular brand, make of material, device or equipment is shown or specified, such brand, make of material, device or equipment is to be regarded merely as a standard and such trade name shall be followed by "or equal".

1.2 QUALITY ASSURANCE

- A. The equipment and materials to be furnished under this Contract shall be the products of well established and reliable firms which have had ample experience for at least five (5) years in the manufacture of equipment or materials similar in design and of equal quality to that specified. If required, the manufacturer shall submit a list of installations of similar equipment which have been in successful operation for at least five (5) years.

END OF SECTION 013326

SECTION 013543 - ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 UNNECESSARY NOISE, DUST AND ODORS

- A. The Contractor's performance of this contract shall be conducted so as to eliminate all unnecessary noise, dust and odors.

1.2 SEWAGE, SURFACE AND FLOOD FLOWS

- A. The Contractor shall take whatever action is necessary to provide all necessary tools, equipment and machinery to adequately handle all sewage, surface flows and flood flows which may be encountered during the performance of the work. The entire cost of and liability for handling such flows is the responsibility of the Contractor and shall be included in the price for the appropriate item.

1.3 WORK IN FREEZING WEATHER

- A. Written permission from the Engineer shall be obtained before any work is performed which, in the judgment of the Engineer, may be affected by frost, cold, or snow. When work is performed under such conditions, the Contractor shall provide facilities for heating the materials and for protecting the finished work.

1.4 POLLUTION CONTROL

- A. It shall be the responsibility of the Contractor to prevent or limit pollution of air and water resulting from his operations.
- B. The Contractor shall perform work required to prevent soil from eroding or otherwise entering onto all paved areas and into natural watercourses, ditches, and public sewer systems. This work shall conform to all local ordinances and/or regulations, if any, and if not otherwise regulated by local ordinances or regulations shall at a minimum conform to the Ohio EPA General Storm Water NPDES Permit for Construction Activities and the Ohio Department of Natural Resources Rainwater and Land Development manual. This work may consist of but not be limited to construction and continual maintenance of silt fence, bio bag filters, sedimentation traps, stilling basins, check dams, temporary seeding, temporary mulching, erosion mats and other means to clarify waters containing suspended materials from excavations, embankments, cleared and grubbed or stripped areas, stockpiles, well points, and disposal sites and shall be commensurate with the contractor's schedule, sequence of work, means and methods. If a SWPPP plan is not required for the project, the contractor shall at a minimum submit a plan of his proposed erosion control prevention methods for approval by the Owner and/or other regulatory authorities having jurisdiction prior to starting any construction activities which may cause erosion.

- C. The Contractor shall perform work required to prevent dust attributable to his operations from entering the atmosphere. Dust on unsurfaced streets or parking areas and any remaining dust on surfaced streets shall be controlled with water and/or calcium chloride dust palliative as needed.
- D. Any material removed from sanitary or storm sewers shall be disposed in accordance with all applicable regulations.

END OF SECTION 013543

SECTION 014126 - GENERAL REGULATIONS AND PERMITS

PART 1 - GENERAL

1.1 REGISTRATION

All Contractors and subcontractors shall be registered with the Building Department having jurisdiction. Contact the Building Department for additional registration information.

1.2 ARCHAEOLOGICAL DISCOVERIES

Contractors and subcontractors are required under Ohio Revised Code (O.R.C.) Section 149.53, to notify Ohio's State Historic Preservation Office (SHPO), and to cooperate with that office in archaeological and historic surveys and mitigation efforts if such discoveries are uncovered within the project area.

Contact: Ohio's State Historic Preservation Office
Diana Welling, Resource Protection & Review Department Manager
Phone: 1-614-298-2000
Email: dwelling@ohiohistory.org

Should archaeological discoveries or other activities delay progress of the work, an adjustment in contract time will be made.

END OF SECTION 014126

SECTION 014223 - INDUSTRY STANDARDS

PART 1 - GENERAL

1.1 ABBREVIATIONS

- A. Abbreviations, as used, designate the following:

AASHTO	-	American Association of State Highway and Transportation Officials
ACI	-	American Concrete Institute
AIEE	-	American Institute of Electrical Engineers
AISC	-	American Institute of Steel Construction
ANSI	-	American National Standards Institute
ASTM	-	American Society of Testing and Materials
AWWA	-	American Water Works Association
CMS	-	Construction and Material Specifications
NEMA	-	National Electrical Manufacturers Association
ODOT	-	Ohio Department of Transportation
ORC	-	Ohio Revised Code
UL	-	Underwriters Laboratories, Inc.

1.2 REFERENCE TO OTHER SPECIFICATIONS

- A. Where reference is made to specifications such as ASTM, AWWA or AASHTO, the latest edition shall be used, unless otherwise noted on the plans or in the specifications.

1.3 CODES AND STANDARDS

- A. All work provided for by these specifications must be installed according to the provisions of the State and local building codes, subject to inspection and acceptance by the State and local inspectors.

END OF SECTION 014223

SECTION 014323 – QUALIFICATIONS OF TRADESMEN

PART 1 - GENERAL

1.1 CHARACTER OF WORKMEN AND EQUIPMENT

- A. The Contractor shall employ competent and efficient workmen for every kind of work. Any person employed on the work who shall refuse or neglect to obey directions of the Owner or his representative, or who shall be deemed incompetent or disorderly, or who shall commit trespass upon public or private property in the vicinity of the work, shall be dismissed when the Owner so orders, and shall not be re-employed unless express permission be given by the Owner. The methods, equipment and appliances used on the work and the labor employed shall be such as will produce a satisfactory quality of work, and shall be adequate to complete the contract within the specified time limit.

- B. In hiring of employees for the performance of work under this Contract, or any Subcontract hereunder, no Contractor or Subcontractor, nor any person acting on behalf of such Contractor or Subcontractor, shall, by reason of race, sex, creed or color, discriminate against any citizen of the State of Ohio in the work to which the employment relates. No Contractor, Subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, creed, sex or color.

END OF SECTION 014323

SECTION 015136 - TEMPORARY WATER AND DISTRIBUTION

PART 1 - GENERAL

1.1 WATER

- A. The Contractor shall be responsible for an adequate supply of water suitable for his use for construction and drinking. At his own expense, he shall provide and maintain adequate supplies and supply lines in such locations and installed in such a manner as may be satisfactory to the Engineer.
- B. All water mains within the project area belong to and fall under the control of the Lake County Department of Utilities (LCDU).
- C. Water for cleaning, flushing and hydraulic flow control is available from hydrants within the project area with the proper arrangements with the Lake County Department of Utilities. A \$200 deposit is required. Contact Grant Glazier of LCDU 440.350.2652 to arrange for hydrant meters and billing.

END OF SECTION 015136

SECTION 015213 - FIRST AID

PART 1 - GENERAL

1.1 AID TO THE INJURED

The Contractor shall keep in his office and on the work site, all articles necessary for giving "First Aid to the Injured." He shall also have standing arrangements for the immediate removal and hospital treatment of any employee or other person who may be injured on the work site.

END OF SECTION 015213

SECTION 015526 - TEMPORARY TRAFFIC CONTROL DEVICES

PART 1 - GENERAL

1.1 BARRICADES, SIGNS AND LIGHTS

- A. The Contractor shall employ watchmen on the work when and as necessary. The Contractor shall erect and maintain such strong and suitable barriers and such lights as will effectively prevent the occurrence of any accident to health, limb or property. Lights shall be maintained between the hours of one-half (1/2) hour after sunset and one-half (1/2) hour before sunrise.
- B. No manhole, trench, excavation will be left open awaiting connection or removal at a later date by the Contractor's forces or others but shall be temporarily backfilled and resurfaced if applicable with a temporary pavement passable to traffic at no additional cost to the Owner.
- C. In addition to other safety requirements, a minimum of four (4) foot high fence will be incorporated around any shaft or manhole or other excavation left open at the end of a day's work.

1.2 MAINTENANCE OF TRAFFIC

- A. The Contractor is required to provide maintenance of traffic in conformance with the Ohio Manual of Uniform Traffic Control Devices and Item 614 of the current Construction and Material Specifications of the Ohio Department of Transportation.
- B. This work shall include providing suitable and satisfactorily trained and properly attired flagmen for use at any location where existing roadway is narrowed to a width of less than 2 full lanes (18 feet).
- C. The Contractor is also responsible for maintaining local access to all residences and businesses along the route of the construction and to provide whatever temporary materials are necessary to provide a safe, adequate drive surface.

END OF SECTION 015526

SECTION 016600 - PRODUCT HANDLING AND PROTECTION

PART 1 - GENERAL

1.1 DELIVERY AND STORAGE OF MATERIALS

- A. The Contractor shall be responsible for delivery and storage of all materials.
- B. The Contractor shall coordinate with the Engineer on the arrangement for storing construction materials and equipment. Deliveries of all construction materials and equipment should be made at suitable times.
- C. The Contractor shall store all materials required for the performance of this contract at sites designated by the Engineer.
- D. All stockpiles shall be neat, compact, completely safe, and barricaded with warning lights if necessary.
- E. Precautions shall be taken so that no shade trees, shrubs, flowers, sidewalks, driveways or other facilities will be damaged by the storage of materials. The Contractor shall be responsible for the restoration of all stockpile sites to their original condition.
- F. Materials, tools and machinery shall not be piled or placed against shade trees, unless they shall be amply protected against injury therefrom. All materials, tools, machinery, etc. stored upon public thoroughfares must be provided with red lights at night time so as to warn the traffic of such obstruction.
- G. Materials shall be so stored as to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, shall again be inspected prior to their use in the work. Stored materials shall be located so as to facilitate their prompt inspection. Approved portions of the construction site may be used for storage purposes and for the placing of the Contractor's plant and equipment, but any additional space required therefore must be provided by the Contractor at his expense. Private property shall not be used for storage purposes without written permission of the property owner or lessee, and copies of such written permission shall be furnished the Engineer. All storage sites shall be restored to their original condition by the Contractor at his expense.

END OF SECTION 016600

SECTION 017800 - FINAL COMPLIANCE AND SUBMITTALS

PART 1 - GENERAL

- 1.1 The following forms and related sign-offs shall be documented in accordance with provisions of the contract. These forms shall be completed by the Contractor and approved by the Owner before final retainer is approved for release. Forms for Items A to E will be attached to the Contractor's executed copy of the contract.
- A. Certificate of Substantial Completion (To be submitted at time of Substantial Completion).
 - B. Contractor's Certification of Completion.
 - C. Contractor's Affidavit of Prevailing Wage.
 - D. Consent of Surety Company for Final Payment.
 - E. Affidavit of Final Acceptance Date and Correction Period.
 - F. Before the OWNER will approve and accept the work and release the retainer, the CONTRACTOR will furnish the OWNER a written report indicating the resolution of any and all property damage claims filed with the CONTRACTOR by any party during the construction period. The information to be supplied shall include, but not be limited to, name of claimant, date filed with CONTRATOR, name of insurance company and/or adjuster handling claim, how claim was resolved and if claim was not resolved for the full amount, a statement indicating the reason for such action.

END OF SECTION 017800

SECTION 017821 - CLEANING AND PROTECTION

PART 1 - GENERAL

1.1 GENERAL

- A. On or before the completion date for the work, the Contractor shall tear down and remove all temporary structures built by him, all construction plant used by him, and shall repair and replace all parts of existing embankments, fences or other structures which were removed or injured by his operations or by the employees of the Contractor. The Contractor shall thoroughly clean out all buildings, sewers, drains, pipes, manholes, inlets and miscellaneous and appurtenant structures, and shall remove all rubbish leaving the grounds in a neat and satisfactory condition.
- B. As circumstances require and when ordered by the Engineer, the Contractor shall broom sweep and/or hose-wash the hard surface of the road, or any driveway or sidewalk on which construction activity under this contract has resulted in dirt or any other foreign material being deposited.
- C. Failure to comply with this requirement when ordered by the Engineer or his representative, may serve as cause for the Engineer to stop the work and to withhold any monies due the Contractor until such order has been complied with to the satisfaction of the Engineer.
- D. As the work progresses, and as may be directed, the Contractor shall remove from the site and dispose of debris and waste material resulting from his work. Particular attention shall be given to minimizing any fire and safety hazard from form materials or from other combustibles as may be used in connection with the work, which should be removed daily.
- E. During and after installation, the Contractor shall furnish and maintain satisfactory protection to all equipment against injury by weather, flooding or breakage thereby permitting all work to be left in a new condition at the completion of the contract.

END OF SECTION 017821

SECTION 312323.13 – COMPACTED BACKFILL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. The Contractor shall furnish, place and compact all the materials needed from select excavated materials or furnish additional suitable material if the excavated material is deemed unsuitable or the moisture content is not or can not be made to be within acceptable tolerances of optimum moisture to achieve the specified compaction.
- B. This specification shall be used only where backfill is not under existing or proposed pavement or within the 1:1 zone of influence.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Suitable excavated material as specified in ODOT Item 203.

PART 3 - EXECUTION

3.1 PLACING

- A. Compacted backfill shall be properly placed in layers sufficient to meet the compaction requirement of 95% of maximum laboratory dry density per ASTM D 698 throughout the entire layer and thoroughly compacted with mechanical compaction equipment with moisture adjustment as needed. Should after settlement occur, the Contractor must add and compact additional material, and he must maintain the backfill at the required finished grade or sub-grade until the project is satisfactorily completed and during the correction period.
- B. Approved mechanical compaction equipment shall be used for tamping backfill. Flooding, jetting or puddling of backfill will not be permitted.

END OF SECTION 312323.13

SECTION 312323.14 – COMPACTED GRANULAR BACKFILL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. The Contractor shall furnish, place and compact all the materials needed.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. Aggregate shall be ODOT 304 crushed limestone. Crushed gravel or slag products are unacceptable.
- B. Contractor shall submit current test reports for the lot(s) of the material to be supplied.

PART 3 - EXECUTION

3.1 PLACING AND COMPACTING

- A. Compacted granular backfill shall be properly placed in layers sufficient to meet the compaction requirement of 100% of maximum laboratory dry density per ASTM D 698 throughout the entire layer and thoroughly compacted with mechanical compaction equipment with moisture adjustment as needed. Should after settlement occur, the Contractor must add and compact additional material, and he must maintain the backfill at the required finished grade or sub-grade until the project is satisfactorily completed and during the correction period.
- B. Approved mechanical compaction equipment shall be used for tamping backfill. Flooding, jetting or puddling of backfill will not be permitted.

END OF SECTION 312323.14

SECTION 312333 - UNDERGROUND CONDUIT INSTALLATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Construction Drawings and General Provisions of this Contract including the General and Supplementary Conditions, Specific Project Requirements, Proposal, and all referenced standard specifications apply to work defined in this section.

1.2 DESCRIPTION

- A. This work shall consist of the construction or reconstruction of underground pipe conduits in accordance with these specifications and in reasonable close conformance to the lines and grades shown on the detailed plans or as otherwise established by the Engineer.
- B. This work shall include excavating for the conduit, fittings, and appurtenances; clearing and grubbing and removal of all materials necessary for placement of the conduit except any items paid for separately; furnishing and placing bedding and backfill as required; constructing and subsequently removing all necessary cofferdams, cribs and sheeting; pumping and dewatering; making all conduit joints as required; installing all necessary conduit; joining to existing and proposed appurtenances as required; performing leakage tests as required; restoration of all disturbed facilities and surfaces. The work shall also include the maintenance of existing flow and service to facilities being modified. Procedures for such maintenance shall be as approved by the Engineer prior to any work commencing.

PART 2 - MATERIALS

2.1 CONDUIT

- A. All conduit utilized shall be of one type and size specified in the proposal meeting the requirements of the detailed material specification.
- B. Shop drawings, catalog cuts, and test certifications may be required by the Engineer for all conduit, fittings, and appurtenances.
- C. Aggregate for the bedding and backfill shall conform to the requirements of the plan detail or as modified in writing by the Engineer. All aggregates shall conform to ODOT 703 for soundness and gradation.
- D. All other materials utilized as part of this work shall meet their respective ASTM requirements.

PART 3 - EXECUTION

3.1 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

A. Pavement, Sidewalks, and Curbing

1. Removal of existing pavements, sidewalks, curbing, and similar structures shall end at an existing joint or a sawed joint. Sawed joints shall be straight, neat, and free from chipped or damaged edges.
2. For non-reinforced concrete, the saw cut shall be completely through concrete.
3. For reinforced concrete, the saw cut shall be completely through the steel and concrete.
4. If the concrete is coated with a bituminous surface or other material, the saw cut shall be as specified above.

B. Manholes, Catch Basins, and Inlets

1. Existing drainage structures and sanitary manholes designated by the Engineer to be removed shall be completely removed.
2. Manholes designated to be abandoned shall be removed to an elevation of at least 3 ft. below the finished subgrade or ground surface. The remaining void shall be filled with backfill material in accordance with Section 312323.13 - Compacted Backfill.
3. Live sewers connected to structures removed or abandoned shall be rebuilt through the area with new conduit. Sewer flow shall be maintained between removal and replacement operations. Abandoned sewers shall be sealed and made watertight with approved precast stoppers or masonry bulkheads.
4. All castings salvaged from abandoned or removed structures shall remain the property of the Owner and shall be cleaned and transported by the Contractor to a nearby site designated by the Owner or incorporated in the work where called for on the drawings.

C. Guardrail and Fence

1. Where necessary, existing guardrail and fence shall be carefully dismantled and stored for reuse or for salvage by the Owner.
2. Posts and other materials not considered salvageable by the Engineer shall be disposed of by the Contractor.
3. The Contractor will be required to replace, at no cost to the Owner, material lost or damaged by negligence or by the use of improper methods.

3.2 METHOD OF EXCAVATION

- A. All excavation shall be in open cut unless otherwise permitted by the Engineer. Loosening of material by blasting will not be permitted without written authorization by the Owner specifying both the extent and location of the blasting to be done. If permission is granted the Contractor shall submit in writing his means and methods of blasting to the Owner for

approval. Blasting shall not begin until the Owner issues written approval of the means and method of blasting.

- B. Excavation shall be made to undisturbed finish subgrade to the depth below the bottom of the conduit or structure as shown on the Contract Drawings details.
- C. Trenches shall be excavated with vertical sides from the bottom of the trench to one (1') foot above the top of the conduit from which point sides may slope to ground surface, except that, in streets or roadways, trenches shall be excavated with near vertical sides to the top of the trench. Width of trench in the vertical section shall be excavated only as wide as necessary to accommodate a safety box and to provide free working space on each side of the conduit or structure according to the size of the conduit or structure and the character of the ground. In every case there shall be sufficient space between the conduit or structure and the sides of the trench to make it possible to thoroughly ram the bedding around the conduit or structure and to secure tight conduit joints, but in no case more than twelve inches on either side of conduit. In no case, however, shall the width of the trench at the top of the conduit exceed the dimensions as shown on the contract drawings. In no case will it be permitted to excavate conduit trenches with sides sloping to the bottom.
- D. The trench bottom shall be firm and uniform for its full length. Should unstable material be encountered below plan subgrade, it shall be removed to a depth directed by the Engineer. Replacement of the additional excavation shall be with the specified bedding material or as otherwise directed by the Engineer.
- E. In the case the flow line is changed not to exceed one (1) foot or it becomes necessary to remove unstable material in an amount not to exceed one (1) foot, the same shall be done at one contract bid price or amount. When the flow line is lowered more than (1 foot) or if it becomes necessary to remove more than (1 foot) of unsuitable material below the bottom of the trench, compensation will be provide therefore in a supplemental agreement for the excavation and backfill beyond (1 foot).

3.3 UNAUTHORIZED EXCAVATIONS

- A. All excavations carried outside of the lines and grades given or specified, together with the disposal of such material, and all excavations and other work resulting from slides, cave-ins, swellings or upheavals shall be at the Contractor's own cost and expense. All spaces resulting from unauthorized excavations or from slides or cave-ins shall be refilled at the Contractor's expense with suitable material as specified in ODOT Item 203, "Roadway Excavation and Embankment" or Section 312323.13, "Compacted Backfill" in designated areas shown on the contract drawings or specified under this Section. Compaction requirements shall be in accordance with these specifications.

3.4 SHEETING AND SHORING

- A. The Contractor shall be responsible for supporting and maintaining all excavations required even to the extent of sheeting or shoring the sides and ends of excavations with timber or other satisfactory supports. If the sheeting, braces, shores, stringers, waling timbers, or other supports are not properly placed or are insufficient, the Contractor shall provide

additional or stronger supports. The requirements of sheeting or shoring or of the addition of supports shall not relieve the Contractor of his responsibility for their sufficiency. All trench protection and sheeting and shoring must conform to the regulations of both the Ohio State Industrial Commission (OSIC) and the Federal Occupational Safety and Health Act (OSHA) and will be subject to their respective inspections. All orders of OSIC and OSHA representatives must be complied with by the Contractor.

- B. All sheeting and shoring shall be removed where and when required and, upon its removal, all voids filled. If any sheeting or shoring is ordered to be left in place, it shall be cut-off as directed. In compensation for the sheeting and shoring left in place, if any, shall be by prior written change order.

3.5 REMOVAL OF WATER

- A. All conduit shall be installed in a dry and stable trench. The Contractor may pump or otherwise remove any water, sewage, or other liquid that may be found or may accumulate in the trench.
- B. If, in the opinion of the Contractor, dewatering pumps and equipment are required to maintain a dry and stable trench, suitably sized pumps shall be provided to meet the requirements. The manner and spacing of well points shall be at the Contractor's discretion.
- C. Excess water shall not be considered reason for undercut of trench bottom.
- D. The Contractor shall maintain the pumps for the duration of their need including a satisfactory discharge outlet. Power for the pumps shall be electric unless otherwise approved by the Engineer. Noise abatement may be required for any on-site generators in residential areas.

3.6 BEDDING FOR LAYING CONDUIT

- A. Bedding shall conform to the requirements of the plan detail unless otherwise modified by the Engineer.
- B. All granular bedding material shall be compacted to 95 percent of maximum laboratory dry density.
- C. All pipe bedding shall be of the gradation(s) specified and be limestone. Slag may not be used and gravel may be used with permission of the Engineer.

3.7 LAYING CONDUIT

- A. Except as otherwise permitted by the Engineer, all conduit shall be laid starting at the outlet end. Pressure conduits may be laid from either direction however the joints shall be such that the bell is upgrade or toward normal pressure.

- B. Line and grade for gravity conduits shall be established by the use of sufficient means to maintain acceptable installation tolerances and allow for reasonable checking observation by the Engineer.
- C. Line and grade shall be established and maintained over a length of fifty (50) feet minimum. Cut sheets establishing grade at fifty (50) foot intervals shall be provided to the Engineer prior to beginning work.
- D. The Contractor shall provide sufficient equipment and workers to safely handle and lay all conduit included as part of this work. All storage of materials shall be in a manner as to avoid damage to either surface prior to placement.
- E. The Contractor shall inspect each piece of conduit prior to placement in the trench and any unsatisfactory conduit shall be rejected.
- F. Conduit shall not be laid in water, mud, or any otherwise unsuitable trench. The conduit shall not be pushed into or allowed to fall to the bottom of the trench. Handling of the conduit shall be in conformance to the manufacturer's recommendations.
- G. The conduit shall be kept clean and any open ends of installed conduit shall be closed when work is not in progress.
- H. Jointing of the conduit shall be in accordance to the requirements of the manufacturers and as required by the specification material type. Any deviation from these acceptable methods requires approval of the Engineer.
- I. Testing of joints, where required, shall be done in accordance with the Specification for Testing. Should any section fail to meet test requirements, the Contractor shall make suitable corrections, at their cost, until the requirements are met.

3.8 SERVICE CONNECTIONS

- A. In general, and as called for on the drawings, as required or as ordered, provision shall be made in the sewers for service connections by inserting a wye branch for each service connection with a branch size called for by the contract drawings but never less than six (6) inch, in the sewer at location shown, where required or ordered, for sewers to ten (10) feet in depth. For sewers exceeding ten (10) feet in depth, or indicated on the plans, the Contractor shall construct a riser, as per detail, in such manner, that the top of the riser shall be not less than seven (7) feet below grade or at such elevation as to properly receive the required service connection, with full regard to elevation of service sewer and slope from building or structure to the sewer which shall not be less than one percent (1%). Risers are to be encased in sonotube filled with No. 57 Limestone as shown on the contract drawings.
- B. The location of service connections is shown in a general way on the contract drawings. The Owner may also increase the number of connections or delete some connections as the sewer is being built, or increase the size of connections when it deems such advisable.

3.9 FINAL BACKFILL

- A. Final backfill shall be installed from the top of the Pipe Embedment to the final grade. Final backfill of all conduit trenches shall conform to the requirements of the plans and details, Section 312323.13 "Compacted Backfill", and Section 312323.14 "Compacted Granular Backfill". All final backfill under existing or proposed pavement or structures or within the 1:1 zone of influence of existing or proposed pavement or structures shall be "Compacted Granular Backfill". All final backfill not under existing or proposed pavement or structures or within the 1:1 zone of influence of proposed pavement or structures shall be "Compacted Backfill".
- B. Unless otherwise directed, all forms, bracing and lumber shall be removed during backfilling and the cavities and voids resulting from the removal shall be backfilled and compacted to 100% of Standard Proctor.
- C. The Contractor must use special care in placing backfill so as to avoid injuring or moving the conduit or structure when compacting the backfill.
- D. In areas used for temporary maintenance of traffic the top layer of final backfill from the elevation of the existing subbase base interface to the existing or proposed surface(s), shall be ODOT Item 304 Aggregate Base to provide a temporary surface traffic course.
- E. Should after settlement occur, the Contractor must add and compact additional material.
- F. Machine mounted mechanical tamper shall be used for backfill compaction. Flooding, jetting or puddling of backfill will not be permitted.
- G. Excavated material in excess of that needed for backfilling and all unsuitable material shall be disposed of by the Contractor at his own expense and the cost of such disposal shall be included in the unit or lump sum prices bid.

3.10 TESTING AND ACCEPTANCE

- A. Prior to final acceptance of the conduit or the placing of the conduit into service, testing and/or televising may be required.
- B. For all sanitary, water, or other pressured conduits, pressure testing shall be required in accordance to the specifications contained herein. Televising shall be required for all sanitary sewer and may be required for storm sewers as outlined or required by plan note.
- C. Final television inspection of conduit shall be performed by an experienced company and in a format satisfactory to the Owner. Televising shall be done in the presence of the Engineer unless so waived. The Engineer shall be provided with unedited video tapes and two (2) copies of the video log.
- D. Televising shall not be done until all known repairs are completed and the line has been suitably flushed.

3.11 SITE RESTORATION

- A. Restoration of the disturbed project area shall begin immediately after backfilling has been completed. All excess material, debris, and excavation shall be disposed of by the Contractor.
- B. Restoration of paved surfaces and of seeded areas shall be done as soon as conditions permit. The manner in which this work shall be done is defined in other specifications or the contract plans.
- C. While payment for site restoration may be included in other items, final acceptance of the underground conduit shall not occur until all work is complete. Where no separate pay items exist for restoration work, the Engineer may determine an appropriate value for this work to be retained until its completion.

END OF SECTION 312333

SECTION 321000 - PAVEMENT REPLACEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. The Contractor shall furnish all of the equipment, labor and materials necessary to install, replace, and/or restore existing pavement structures together with their respective appurtenances as shown on the plans and as specified herein. This work shall include all of the subgrade preparation, subbase, base, intermediate pavement course(s), and finish pavement courses together with curbing, guttering, tack and/or prime coating, sealing and other pertinent work as necessary to meet the conditions of this contract.

1.3 QUALITY ASSURANCE

- A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work.

1.4 REPAIR OR REPLACEMENT WORK

- A. For the repair and/or replacement of all existing pavement structures and their respective appurtenances that are removed and destroyed or otherwise damaged by the Contractor in the course of his performance of the work required under this contract, the Contractor shall furnish all equipment, labor, and materials as necessary to properly restore to a condition equal to that at his entry, and to the satisfaction of the Engineer, the Ohio Department of Transportation, the County Engineer, City Engineer, all cinder, slag, gravel, water-bound macadam, bituminous macadam, asphalt and brick or concrete driveways, curbs, sidewalks and roadways in strict accordance with the drawings and as specified herein.
- B. In general, this item will include concrete, steel reinforcement, brick, stone, slag, cinders, gravel, asphalt and other bituminous materials and curbs, gutters, driveway culverts, road and curb drains and the demolition, excavation and removal of existing driveways, sidewalks and roadways.

1.5 REFERENCE TO OTHER PARTS

- A. Other sections of these specifications shall apply, as and where applicable to this section and such sections will be the same as though they were included in this section.

- B. For all old work where pavement is being repaired and/or replaced as a result of damages occurring thereto during the course of the work of this contract, all clearing and grubbing, removal and storage of topsoil, excavation and/or placing of compacted fill and granular backfill, shall be done as required under other parts of these specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Generally, for all repair and replacement work, all new materials shall match the existing and adjoining work in both composition and quality unless otherwise ordered, specified herein, and/or shown on the drawings. In any stone driveway or roadway, the material used for stone fill shall conform to the existing material.

PART 3 - EXECUTION

3.1 CONSTRUCTION

- A. All pavement work shall be done in strict accordance with the specifications of the governmental body concerned and the latest ODOT specifications as applicable or at the direction of the Engineer.
- B. All pavements disturbed by the Contractor's operations shall be relaid to the thickness of the adjoining pavement and, in all cases, the restoring of pavements, shall apply both to foundation courses and to the wearing surface.
- C. Should cracks or settlements appear in adjoining pavements, the paving shall be removed to the extent necessary to secure firm and undisturbed bearing and shall be replaced in a satisfactory manner.
- D. No permanent pavement shall be installed, repaired, and/or restored unless, or until, in the opinion of the Engineer, the condition of the backfill is such as to properly support the pavement.
- E. Where new or replacement concrete pavement or base is placed adjacent to existing concrete pavement or base, contraction joints shall be provided in the new or replacement pavement so as to form a continuous joint with that in the existing pavement.

3.2 ROADWAY SUBGRADE

- A. The entire area to be occupied by the roadways and parking areas shall be cleared, topsoil removed and stored, and the excavation or compacted fill made as required and brought to the proper cross-sections. Pipe trenches and other excavations shall be backfilled as required, and thoroughly compacted within the limits of the roadways or parking areas.

- B. After the surface of the subgrade has been properly shaped and before any stone or slag is placed, the entire subgrade shall be thoroughly rolled and compacted to a depth of 12 inches under this section. Rolling shall be done with an approved type of self-propelled roller, weighing not less than ten (10) tons. All hollows and depressions which develop during the rolling shall be filled with acceptable materials, and the subgrade rerolled. The process of filling and rolling shall be repeated until no depressions develop, and the entire subgrade has been brought to a uniform condition of stability.
- C. All places which, in the opinion of the Engineer cannot be properly rolled, shall be tamped with handheld mechanically or pneumatically powered tampers.
- D. In making the compacted fill and in doing the final subgrade rolling, the Contractor shall see that the material to be compacted and/or rolled has the proper moisture content to secure maximum compaction. When, in the opinion of the Engineer, the material is too wet, the compacting shall be delayed until the material has dried sufficiently. When, in the opinion of the Engineer, the material is too dry, the material shall be sprinkled with water in an amount to secure the proper moisture content.

3.3 TRAFFIC PAINT

It shall be the responsibility of the Contractor to replace all existing pavement markings in the style and at the locations that existed prior to this work. The Contractor shall make records of these markings as they exist and will supply these records to the Engineer prior to the start of any work. In the absence of such documentation, the Owner's discretion shall prevail. Unless specifically paid for in other items, the cost of pavement marking replacement shall be included in the Contractor's bid price of pavement.

END OF SECTION 321000

SECTION 321313.33 - PORTLAND CEMENT CONCRETE SEALING

PART 1 - SUBMITTALS

1.1 SUBMITTALS

- A. The Contractor shall submit technical information and a certified statement stating that the material to be furnished conforms to the material requirements of this section of the specifications.
- B. Copies of waybills and delivery tickets shall be submitted to the Contracting Officer during the progress of the work. Before final payment is allowed, the Contractor shall file with the Contracting Officer certified waybills and delivery tickets for all concrete sealer used in the work.

1.2. PORTLAND CEMENT CONCRETE SEALING TREATMENT

- A. The concrete sealer shall be an approved non-epoxy, non-silicone, non-toxic, non-hydrophobic, non-solvent material, and shall meet the following qualifications and AASHTO and ASTM test performance criteria, based in accordance with the manufacturer's recommended rate of coverage.

- 1. The penetrating sealer, after finished application, shall not darken, stain or discolor the treated concrete.
- 2. Application of the sealer shall not alter the surface texture or form a film or coating on the surface, and shall be compatible with the concrete pavement joint materials.
- 3. AASHTO T 259 Resistance of Concrete to Chloride Ion Penetration

Sealer-treated test specimens shall exhibit the following average values when an average of 0.125 inches of the treated concrete specimen has been abraded from the surface to simulate 10-12 years of traffic wear. Abrasion will be performed after treatment with sealer; and before ponding with chloride solution.

<u>Test</u>	<u>Duration</u>	<u>Average Absorbed CL</u>	<u>Method Used</u>
Salt water ponding	90 days	2.50 lbs. per cubic yard	AASHTO T259
	2160 hours	Depth of Measurement: 1/16" to 1/2" * 0.04 lbs. per cubic yard Depth of Measurement: 1/2" to 1.0"	AASHTO T260

* Based on abraded concrete specimens.

4. ASTM C672 Scaling Resistance of Concrete Surfaces

Sealer-treated test specimens shall exhibit a 0 (zero) scale reading, and an improvement over untreated specimens after completion of a minimum of 50 freeze-thaw cycles; or until a difference between treated and untreated specimens develops. Example after 50 cycles:

<u>Specimen</u>	<u>Scale Rating</u>
Untreated	2+ (light to moderate scaling)
Treated	0 (no scaling)

5. AASHTO T161/ASTM C666 Resistance of Concrete to Rapid Freezing and Thawing

Treated specimens shall demonstrate equal or better durability to surface scaling than the frost resistant concrete used as a control upon completion of the test after a minimum of 300 freeze-thaw cycles. Example:

<u>Cycles</u>	<u>Control</u>	<u>Treated</u>
146	Slight	None
237	Slight	Slight
480	Slight	Slight

6. ASTM C501 Relative Resistance to Wear

Treated test specimens shall meet or exceed the improvement percentages as specified below on nominal 3,000 psi concrete after 1,000 revolutions:

<u>Specimen</u>	<u>Average Abrasive Wear Index</u>	<u>Average Depth of Wear</u>	<u>Average Absolute Weight Loss</u>
Treated	27.4	.026	3.227 gm
Untreated	19.9	.033	4.525 gm
Improvement	37.7%	21.2%	28.7%

7. ASTM C882 Bond Strength of Epoxy-Resin Systems used with Concrete

Test results shall demonstrate bond strength of treated samples equal to untreated samples used as a control.

8. Depth of Penetration

Depth of Penetration shall be a minimum of 1/8 in. as demonstrated by successful testing in accordance with AASHTO T 2590 (based on abroad specimens).

- B. The concrete sealer to be used shall be SINAK Concrete Sealer or approved equivalent. To be considered equivalent, the Contractor must submit the following with his bid. Products submitted after the bid date will not be considered.
 - 1. Verifiable evidence from approved independent laboratory(s) confirming that the material proposed for consideration meets or exceeds the test criteria of each and every test set forth in this specification. Any product that does not meet or exceed the results of all tests will not be considered.
 - 2. A written certification from the manufacturer that the material proposed for consideration meets all of the other requirements of this specification as listed in Paragraph B. above.
 - 3. The manufacturer's application instructions and procedures, and rate of coverage shall be included with all submittals for consideration.

1.3 SURFACE PREPARATION

- A. The Contractor shall prepare surfaces to be sealed by thoroughly cleaning same with mechanical sweepers of an approved type and with wire brooms where necessary. All surfaces to be treated shall be power washed with a high pressure washer. To be clean, the surfaces shall be free of sand, clay, dust, salt, grease, oil, curing compound, and other foreign matter which might adversely affect the penetrating capability of the sealer.

1.4 APPLICATION OF CONCRETE SEALER

- A. Equipment to be used shall be as recommended by the manufacturer and shall include a low pressure airless or gravity type sprayer with an application pressure of approximately 40 psi, using a spray tip large enough to deliver an even fan spray without misting.
- B. Application of the concrete sealer shall be recommended by the manufacturer and in accordance with the following:
 - 1. The application shall consist of two coats minimum. Each coat shall be in a light, even coat which shall be allowed to dry completely before continuing application. If a light sheen is visible when the second coat is dry, stop sealer application, and proceed to the water spray application.

If no sheen is visible when the second coat is dry, repeat coats until a light sheen is apparent. Immediately after the final seal coat has been applied and allowed to dry, a light, even water-spray shall be applied to all treated surfaces to ensure complete penetration of the sealer. If a sheen is still visible after the water coat has dried, additional water coats shall be applied until the sheen is no longer evident and the concrete finish appears dull.

Coverage rate for SINAK Concrete Sealer S-102 will generally average 300-500 square feet per coat. The manufacturer or approved distributor will be present during the application of the first 1,000 square feet application to insure proper application procedures are followed. Based upon the first 1,000 square feet application, the manufacturer (or distributor) and the Project Engineer will agree upon a coverage rate to use for both coats within the range noted above.

2. Weather Limitations

Sealer should not be applied when temperatures are below 40°F or are expected to fall below 32°F within 24 hours or when rain is forecasted within 24 hours.

1.5. WARRANTY

- A. The Manufacturer shall provide a 5-year warranty that shall cover labor and material for damages from water, freeze/thaw, salt, acid rain, and from surface deterioration due to reinforcing steel corrosion or from ultra-violet exposure.
- B. The warranty shall be valid even if the treated surfaces is abraded off to a depth of up to 1/16-inch.
- C. The applicator shall be factory-trained and certified as competent, by the manufacturer with respect to the products specified herein. The applicator shall provide proof of certification.

Installation furnished by the factory certified applicator is required to qualify the project for the 5-year warranty.

END OF SECTION 321313.33

SECTION 329200.19 – SEEDING AND MULCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Installation of seeded areas shall be to the extent shown on Contract Drawings and shall include supplying all seed, topsoil, soil conditioning materials, mulching materials and watering, and the incorporation of these materials into the work as specified.
- B. The Contractor shall place topsoil at the depths specified in those areas requiring seeding. Topsoil shall be furnished by the Contractor.

1.2 SUBMITTALS

- A. Product Data: For the following:
 - 1. Provide copies of soils tests for both new topsoil (provided) and onsite topsoil for review and approval. This applies to all areas that require seeding, including reconditioned areas.
 - 2. Provide location of properties from which topsoil is to be obtained, names and addresses of owners, depth to be stripped, and crops grown in the past 2 years.
 - 3. Provide the name of the seed supplier, name and phone number, list of the seed, including varieties of seed, labels, and an analysis of the seed for review, 4 weeks prior to the start of seeding.
 - 4. Provide soil amendments information based on soils test requirements.
 - 5. Hydroseed mixture, mulch and application rates prior to performing the work.

1.1 QUALITY ASSURANCE

- A. Any subcontracted restoration work shall be performed by a qualified firm specializing in landscape work.
- B. The Contractor shall have a soils test done at his expense and analyzed by a state approved testing agency. Soil tests shall be done on both the topsoil stockpiled from the site and new topsoil brought to the site. A minimum of two (2) tests shall be done. The tests shall include percent organic matter, pH, Buffer pH, Phosphorus, Exchangeable Potassium, Calcium, Magnesium, Cation Exchange Capacity and Percent Base Saturation with recommendations for nitrogen, phosphate, potash, magnesium and lime based on plant type and use.
- C. Seed: All seed specified shall meet O.D.O.T. specifications as to the percentage purity, weed seed, and germination. All seed shall be approved by the State of Ohio, Department

of Agriculture, Division of Plant Industry, and shall meet the requirements of these specifications.

- D. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

1.4 PROJECT CONDITIONS

- A. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, such conditions shall be rectified by the Contractor before planting, with approval from the Owner's Representative.
- C. Soil Stabilization: The Contractor shall provide permanent or temporary soil stabilization to denuded areas within fifteen (15) days after final grade is reached on any portion of the site. Any such area which will not be regraded for longer than fifteen (15) days shall also be stabilized. Soil stabilization includes any measures which protect the soil from the erosive forces of raindrop impact and flowing water. Applications include seeding and/or mulching, or the use of other erosion control measures as directed by the Owner's Representative. If necessary, the Contractor shall coordinate soil stabilization practices with the local Soil and Water Conservation District.
- D. Spring-sown work shall be installed between April 1st and May 30th and Fall-sown work shall be installed between September 1st and October 15th. No permanent seeding shall take place between May 30th and September 1st and between October 15th and April 1st. The dates for seeding may be changed at the discretion of the Owner's Representative.

PART 2 - PRODUCTS

2.1 TOPSOIL

- A. Topsoil shall be furnished by the Contractor. Stockpiled material, if any, shall be utilized prior to obtaining additional topsoil.
- B. All topsoil shall conform to the U.S. Department of Agriculture soil texturing triangle and shall contain between 3% to 8% organic matter. Topsoil shall be loamy and not consist of more than 38% clay. New topsoil shall be screened to remove clay lumps, brush, weeds, litter, roots, stumps, stones larger than ½" in any dimension and any other extraneous or toxic matter harmful to plant growth.

New topsoil shall be obtained only from naturally well drained sites where topsoil occurs in a depth of not less than 4". Do not obtain from bogs or marshes.

- C. Soil amendments shall be added according to the soils test requirements. Amendments can include, but are not limited to fertilizer, lime, compost, sand, and organic matter. Organic matter shall consist of composted leaves or other approved material.

2.2 SEED

- A. Seed shall be vendor mixed, delivered in original bags and shall be proportioned as follows:

<u>Common Name</u>	<u>Proportion by Weight</u>
Kentucky Blue Grass	50%
Perennial Rye	50%

2.3 MULCH

- A. Mulch shall be clean straw free of seed and weed seed.
 - 1. Anchoring for mulch shall be an ODOT specified SS-1 at 60 gal./ton non-toxic tackifier such as Hydro-stik, or equal, or by securing with a photo degradable netting.
- B. If hydroseeding is used, wood fiber mulching material shall be used and shall consist of virgin wood fibers manufactured expressly from whole wood chips and shall conform to the following specifications.

- Moisture content	10.0% ± 3.0%
- Organic content	99.2% ± 0.8% O.D. Basis
- pH	4.8 ± 0.5
- Water holding capacity, minimum (grams of water per 100 grams of fiber)	1,000

Wood fiber mulching material shall be processed in such a manner as to contain no growth or germination inhibiting factors, and must contain a biodegradable green dye to aid in visual metering during application.

PART 3 - EXECUTION

3.1 PREPARATION - GENERAL

- A. Rough grading to a depth necessary to accept the specified thickness of topsoil must be approved prior to placing topsoil.
- B. Loosen subgrade, remove any stones greater than ½” in any dimension. Remove sticks, roots, rubbish, and other extraneous matter.
- C. Spread topsoil to a minimum depth of 4 inches, to meet lines, grades, and elevations shown on plan, after light rolling and natural settlement. Remove sticks, roots, rubbish, stones greater than 1/2" in any dimension, and other extraneous matter. Topsoil shall be tilled

thoroughly by plowing, disking, harrowing, or other approved methods. Add specified soil amendments and mix thoroughly into the topsoil.

- D. Preparation of Unchanged Grades: Where seed is to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for planting as follows: Till to a depth of not less than 6 inches. Apply soil amendments and initial fertilizers as specified. Remove high areas and fill in depressions. Till soil to a homogenous mixture of fine texture, free of lumps, clods, stones, roots and other extraneous matter. Soils test requirements apply here as well.
1. Prior to preparation of unchanged areas, remove existing grass, vegetation and turf. Dispose of such material outside of project limits. Do not turn existing vegetation over into soil being prepared for seed.

If necessary, supply and install topsoil in areas where there is no topsoil left after vegetation has been removed.
 2. Apply specified soil amendments at rates specified in the soils test and thoroughly mix into upper 2 inches of topsoil. Add topsoil if existing grade has less than 4" of topsoil. Delay application of amendments if planting will not follow within two (2) days.
- E. Fine grade areas to smooth, even surface with loose, uniformly fine texture. Roll, rake, and drag lawn areas, remove ridges and fill depressions, as required to meet finish grades. Remove sticks, roots, rubbish, stones greater than 1/2" in any dimension, and other extraneous matter. Limit fine grading to areas which can be planted immediately after grading.
- F. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
- G. Restore areas to specified condition, if eroded or otherwise disturbed, after fine grading and prior to planting.

3.2 SEEDING

- A. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage. Seed shall not be sown when the ground is frozen, muddy, or when weather conditions prevent proper soil preparation, interference with sowing and/or proper incorporation of seed into the soil.
- B. Sow seed using a spreader or hydroseeder. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing 3 lbs. per 1000 S.F. at right angles to each other. Total amount to equal a minimum of 6 lbs. per 1000 S.F.
- C. For seed sown with a spreader, mulch shall be spread uniformly to form a continuous blanket at a rate of 100 lbs. per 1,000 S.F. Mulch shall be 1 1/2" loose measurement over seeded areas and shall be anchored.

- D. Contractor has the option to hydroseed large lawn areas, using equipment specifically designed for such application. The rate of application of wood fiber mulching materials is 40 lbs./1,000 S.F. Contractor shall not hydroseed within close proximity to buildings and structures, or when unfavorable wind conditions may blow the hydroseed material onto the structure. Contractor shall clean all areas not to be seeded of overspray.
- E. The seeded area shall be watered, as soon as the seed is applied, at the rate of 120 gallons per 1000 square feet. The water shall be applied by means of a hydroseeder or a water tank under pressure with a nozzle that will produce a spray that will not dislodge the mulching material. Cost of this watering shall be included in the cost of seeding and mulching.

3.3 DORMANT SEEDING METHOD

- A. Seeding shall not take place from October 15 through November 20. During this period prepare the seed bed, add the required amounts of lime and fertilizer, and other amendments, then mulch and anchor.
- B. From November 20 through April 1, when soil conditions permit, prepare the seed bed, lime and fertilize, apply the selected seed mixture, mulch, and anchor. Increase the seeding rate by 50 percent.

3.4 RECONDITIONING EXISTING LAWNS

- A. A soils test shall be required for existing lawns prior to any reconditioning.
- B. Recondition all existing lawn areas damaged by Contractor's operations including storage of materials and equipment and movement of vehicles. Also recondition existing lawn areas where minor regrading is required.
- C. Provide soil amendments as called for in the soils test.
- D. Provide new topsoil, as required, to fill low spots and meet new finish grades.
- E. Cultivate bare and compacted areas according to the topsoil specifications.
- F. Remove diseased and unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from the Contractor's operations, including oil drippings, stone, gravel, and other loose building materials.
- G. All work shall be the same as for new seeding.
- H. Water newly planted seed areas. Maintenance of reconditioned lawns shall be the same as maintenance of new lawns.

3.5 ESTABLISHMENT

- A. Maintain work areas as long as necessary to establish a uniformly close stand of grass over the entire lawn area. A uniformly close stand of grass is defined as the seeded areas having

90%+ coverage of grass at 60 days after seeding. 90%+ coverage is defined as very little or no dirt showing when seeded area is viewed from directly overhead.

- B. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth acceptable lawn.
 - 1. Mowing
 - a. Mow lawn areas during the period of maintenance to a height of 2 inches whenever the height of the grass becomes 3 inches. A minimum of 3 mowings is required during the period of maintenance.
 - 2. Refertilizing
 - a. Distribute fertilizer on the seeded area between August 15 and October 15, during the period when grass is dry, and in accordance with the manufacturer's recommendations. The fertilizer shall be as specified in the soils test.
 - 3. Reseeding
 - a. Reseed with the seed specified for the original seeding, at the rate of 4 lbs. per 1,000 S.F. in a manner which will cause minimum disturbance to the existing stand of grass and at an angle of not less than 15 degrees from the direction of rows of prior seeding.
 - 4. Watering
 - a. The Contractor shall keep all work areas watered daily to achieve satisfactory growth. Water shall be applied at a rate of 120 gallons per 1,000 square feet. If water is listed as a pay item, it shall be separately paid for based on the actual amount of water used, measured in thousands of gallons.
 - 5. Any mulching which has been displaced shall be repaired immediately. Any seed work which has been disturbed or damaged from the displacement of mulch shall be repaired prior to remulching.

3.6 INSPECTION AND ACCEPTANCE

- A. When seeding work is complete and an acceptable stand of growth is attained, the Contractor shall request the Owner's Representative to make an inspection to determine final acceptance.
- B. Acceptance shall be based upon achieving a vigorous uniformly stand of the specified grasses. If some areas are satisfactory and some are not, acceptance may be made in blocks, provided they are definable or bounded by readily identified permanent surfaces, structures, or other reference means. Partial acceptance decisions may be made by the Owner's Representative. Excessive fragmentation into accepted and unaccepted areas shall not be allowed. Unaccepted areas shall be maintained by the Contractor until acceptable.
- C. No payment shall be made until areas are accepted.
- D. All seeded areas shall be guaranteed for one full growing season to commence upon final acceptance of the areas.

END OF SECTION 329200.19