
SECTION 5
SPECIFICATIONS

SECTION 011100 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 LOCATION OF THE PROJECT

- A. The 2023 Pavement Repair Program is located on the following Streets:
 - 1. Fern Drive: From E. 300th Street to E. 305th Street
 - 2. E. 317th Street: From Vine Street to East 317th Street
 - 3. Glenhurst Road: From Royalview Drive to Ronald Drive
 - 4. E. 328th Street: From Lakeshore Boulevard to Willowick Drive
 - 5. Bunker Road: From Fairway Boulevard to Clarmont Road – *Alternate A*
 - 6. Manry Park: Parking lot and drive to Arnold Drive - *Alternate B*

1.2 PROJECT DESCRIPTION

- A. The project consists of a base bid and two alternates. ***The bidder must bid all alternates.***
- B. Base Bid:
 - 1. Repair of existing asphalt pavement (*Fern Drive, East 317th Street, Glenhurst Road and E. 328th Street*) consists of pavement planing, ODOT 253 base repairs (CY, depth as directed but a minimum of 3”), misc. curb and drive apron replacement, curb ramp removal and replacement, casting adjustments, single chip seal, asphalt concrete intermediate course, tack (trackless), void reducing asphalt membrane (VRAM), and asphalt concrete surface course.
- C. Alternate A – Repair of existing asphalt pavement (*Bunker Road*) as described in the base bid description above.
- D. Alternate B – Repair of existing asphalt pavement (*Manry Park Asphalt Parking Lot*) as described in the base bid description above.

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 the Contractor 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 the Contractor and all 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 this Contract is shown on the following drawings.

<u>Title</u>	<u>Sheet No.</u>
Cover Sheet	1
General Notes	2
Typical Sections	3
Fern Drive	4
Gilchrist Drive	5
E. 317 th Street	6
E. 328 th Street	7
Bunker Road (Alt 1)	8
Manry Park Parking Lot (Alt 2)	9
Details	10-12

1.5 QUANTITY WORKSHEET

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

END OF SECTION 011100

City of Willowick
2023 Road Program
BID QUANTITIES

LENGTH (FT)
APPROX WIDTH (FT)
PAVE. AREA (S.Y.)

		BASE BID						
		17+22	10+19	09+84	31+37			
		24	24	24	24			
		4,592.0	2,717.3	2,625.0	8365.0			
ITEM #	ITEM DESCRIPTION	UNIT	P-1	P-2	P-3	P-4	Extra	Base Bid
			Fern Dr	Glenhurst	E. 317	E. 328	Quantity	Total Quantity
SPC	PRECONSTRUCTION VIDEO DOCUMENTATION, AS PER PLAN	LS					1	1
SPC	BONDS AND INSURANCES, AS PER PLAN	LS					1	1
204	EXCAVATION OF SUBGRADE AND EMBANKMENT WITH GRANULAR MATERIAL, CCS, AS PER PLAN, CONTINGENCY, AS DIRECTED	CU YD	0.0	0.0	0.0	0.0		0
251	PARTIAL DEPTH PAVEMENT JOINT REPAIR, AS PER PLAN	CU YD	1.1	0.6	0.6	1.9		5
252	FULL DEPTH PAVEMENT SAWING , AS PER PLAN	FT						0
253	PAVEMENT REPAIR, AS PER PLAN	CU YD	76.5	43.8	22.6	69.7		213
254	PAVEMENT PLANING, ASPHALT CONCRETE, A.P.P.	SQ YD	4592.0	2625.0	2717.3	8365.0	1.0	18301
254	PAVEMENT PLANING, PCC, GUTTER GRINDING, AS PER PLAN	SQ YD					5.0	5
255	FULL DEPTH PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS QC MS, T=8", AS PER PLAN	SQ YD						0
407	TACK COAT, TRACKLESS TACK	GAL	459.2	262.5	271.7	836.5		1830
422	SINGLE CHIP SEAL , TYPE A	SQ YD	4592.0	2625.0	2717.3	8365.0	8.0	18308
441	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22, AS PER PLAN	CU YD	159.4	91.1	94.4	290.5	4.0	640
441	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448), AS PER PLAN	CU YD	223.2	127.6	132.1	406.6	1.0	891
452	6 INCH NON-REINFORCED CONCRETE DRIVES AND APRONS, CLASS QC MS, INCLUDING FIBER REINFORCING, INCLUDING REMOVAL, AS PER PLAN	SQ YD	20.0	40.0	80.0	10.0	20.0	170
608	4 INCH CONCRETE WALK, INCLUDING REMOVAL, AS PER PLAN	SQ FT	0.0				200.0	200
608	6 INCH CURB RAMP, INCLUDING FIBROUS REINFORCEMENT, INCLUDING REMOVAL, AS PER PLAN	SQ FT	100.0	100.0	100.0	120.0		420
609	CURB, TYPE 3-B, AS PER PLAN	FT					30.0	30
609	CURB, TYPE 4-C, INCLUDING REMOVAL, AS PER PLAN	FT	86.1	49.2	51.0	313.7		500
611	CATCH BASIN ADJUSTED TO GRADE, METHOD D.1 (brick), AS PER PLAN	EACH	12.0	8.0	8.0	13.0		41
611	CATCH BASIN PARTIALLY RECONSTRUCTED TO GRADE, AS PER PLAN	VERT FT.					10.0	10
611	MANHOLE ADJUSTED TO GRADE, METHOD D.1 (brick), AS PER PLAN	EACH	11.0	6.0	7.0	16.0		40
611	MANHOLE PARTIALLY RECONSTRUCTED TO GRADE, AS PER PLAN	VERT FT.					10.0	10
SPC	SPECIAL - MISCELLANEOUS METAL	POUND	1280.0	800.0	840.0	1550.0		4470
614	MAINTAINING TRAFFIC, AS PER PLAN	LS					1.0	1
621	SPEED BUMP, 72" L X 2" H	EA						
623	MONUMENT BOX ADJUSTED TO GRADE	EACH					4.0	4
638	VALVE BOX ADJUSTED TO GRADE, RISER RING, AS PER PLAN	EACH	7.0	7.0	4.0	4.0		22
642	TRAFFIC PAINT, AS PER PLAN	LS					1.0	1
SPC	LAWN RESTORATION INCL. LINEAL GRADING & TOPSOIL, AS PER PLAN	LS					1.0	1
SPC	SPECIAL - VOID REDUCING ASPHALT MEMBRANE (VRAM)	FT	1722.0	984.4	1019.0	3136.9		6863
SPC	CONTINGENCY/DISCRETIONARY ALLOWANCE	LS					1	1

		ALT A
		04+20
		24
		1210.0
P-5	Alternate 1	
Bunker	Total Quantity	
		0
		0
0.0	0	
0.1	0	
	0	
20.2	20	
1210.0	1210	
	0	
	0	
121.0	121	
1210.0	1210	
42.0	42	
58.8	59	
20.0	20	
0.0	0	
	0	
42.0	42	
2.0	2	
	0	
5.0	5	
	0	
300.0	300	
	0	
	0	
	4	
2.0	2	
	0	
	0	
420.0	420	
	0	

		ALT B
		N/A
		N/A
		7812.3
P-6	Alternate 2	
Manry Park	Total Quantity	
		0
		0
130.2	131	
	3	
	0	
130.2	131	
7812.3	7813	
	0	
	0	
781.2	782	
7812.3	7813	
	0	
	0	
271.3	272	
379.8	380	
	30	
200.0	200	
	200	
	0	
	0	
50.0	50	
	5	
	0	
4.0	4	
	0	
	0	
510.0	510	
	0	
	0	
4.0	4	
	0	
	0	
	0	
	0	
	0	
	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 CLOSING STREETS TO TRAFFIC

The Contractor may, with the approval of the Engineer, close streets, or parts of streets, to vehicular traffic. The streets are to remain closed as long as the construction work or the condition of the finished work requires or as determined by the Engineer. The Engineer shall be the judge of how many streets or parts of streets it is necessary for the Contractor to close at any time, and may refuse to permit the closing of additional streets to traffic until the majority of the work on the closed streets is completed and they are opened to traffic.

1.4 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.

1.5 EASEMENTS

- A. Where the work is to be constructed upon easements, such easements will be secured by the Owner without cost to the Contractor. The Contractor shall not enter upon or occupy any private property outside of the limits of the easements furnished.
- B. 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.

1.6 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.

1.7 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.

1.8 RESTORATION

- A. On all contract items that require and include surface restoration including repairs to driveways and roads outside trench limits, an amount equal to 10% of the unit price bid for sewer and/or waterline items will be considered the value of this work.
- B. As work is completed, the payment for each contract item will be reduced by the 10% until full performance of all contract requirements.
- C. Partial release of the 10% restoration money may be made by the Engineer commensurate with his determination of the value of said work.
- D. If, in the opinion of the Engineer, the value of the restoration exceeds 10% of the contract line item, he may require a greater amount to be held but not in excess of 25%.
- E. The amount held for restoration shall not be considered retainage of completed work but rather the value of work not yet performed and therefore not eligible for payment.
- F. On lump sum items or contracts, the value of the restoration work will be determined by the approved schedule of values submitted by the Contractor.

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 their 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.

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 AND STAKING

- 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 013223.02

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 DVD record of the surface features within the proposed construction zone of influence. This record shall include, but not be limited to, all audio-video DVDs, 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 video DVD 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 DVD 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 DVD format.

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 for testing and certification of same.
- 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. 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 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 Engineer 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 Engineer so orders, and shall not be re-employed unless express permission be given by the Engineer. 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 015213 - FIRST AID

PART 1 - GENERAL

1.1 AID TO THE INJURED

The Contractor shall keep in their office and on the work site, all articles necessary for giving "First Aid to the Injured." They 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 sewer and to provide whatever temporary materials are necessary to provide a safe, adequate drive surface.
- D. At all boring locations, Contractor shall provide suitable flashers, barricades, and traffic control devices as may be deemed necessary by the Engineer or the responsible authority in the case of the Department of Transportation, Turnpike Commission, or Conrail. This may extend to maintain facilities on a 24-hour basis until such time as the areas are completely backfilled.

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 CONTRACTOR, 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 320116.71 - PAVEMENT PLANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

- A. This work shall consist of planing the existing pavement and disposing of the cuttings in accordance with these specifications in areas designated on the plans or established by the Engineer. When provided for in the contract, the work shall also consist of patching the planed surface.

1.3 JOB CONDITIONS

- A. Existing Pavement Type

- 1. The item description indicates the predominate type of pavement. All pavement encountered in the areas designated on the plans shall be planed, measured, and paid for under the item unless a separate item is provided in the contract.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- A. Planing equipment shall be self-propelled with sufficient power and stability to consistently and efficiently produce the required results. The cutting element may be made of the grinding, sawing, or milling type. Bituminous surfaces also may be planed using the blade type cutter of the heater planer, unless otherwise specified.
- B. Planing cutters shall be mounted rigidly to the carrier and shall be adjustable and controllable as to depth of cut and cross-slope.

Longitudinal planing action may be produced either by means of a suitable carrier wheelbase or by means of an automatic control system having an external reference. Cross-slope adjustments or automatic controls shall be capable of producing either a variable or a constant cross-slope as required.

- C. Planing cutters shall be designed, maintained and operated so as to produce a surface free from grooves, ridges, gouges or other irregularities detrimental to the safe operation of vehicles in traffic routed onto the planed surface, temporarily or permanently.

- D. When heaters are used, adequate provisions shall be made for the safety of persons in the vicinity of the equipment and for preventing damage to adjacent property and facilities, public or private.
- E. Suitable supplemental equipment or methods, approved by the Engineer, may be used in small or confined areas.

PART 3 - EXECUTION

3.1 PLANING

- A. One or more planing passes shall be made over the designated area as necessary to remove such irregularities as bumps, corrugations, and wheel ruts, and when required, as necessary to establish a new pavement surface elevation or cross-slope.
- B. Cuttings shall be removed from the surface following each pass of the equipment. Before opening the completed area to traffic, the surface shall be cleaned thoroughly of all loose material that would create a hazard, a nuisance, or would be redeposited into the surface texture. Cuttings shall become the property of the Owner and shall be delivered to a site as directed by the Engineer.
- C. Effective measures shall be taken to control dust, smoke, contamination of the pavement, and the scattering of loose particles during planing and cleaning operations.
- D. Where sound pavement has been gouged, torn, or otherwise damaged during planing operations, the damaged area shall be repaired at no additional cost in a manner satisfactory to the Engineer to conform to the adjacent pavement in smoothness and durability.

3.2 SURFACE PATCHING

- A. Areas of the planed surface to be patched due to spalling or dislodgement of unsound pavement will be designated by the Engineer. The areas shall be cleaned of loose material, coated with ODOT 407.02 tack coat material, ODOT 702.02 or ODOT 702.04, and filled with asphalt concrete, ODOT 404, leveled and compacted to conform to the adjacent pavement.

3.3 SURFACE TOLERANCES

- A. When the contract provides for planing without resurfacing, the surface shall be planed to a smoothness of plus or minus 1/8 inch in 10 feet and the surfaces at the edges of adjacent passes shall be matched within plus or minus 1/8 inch. When the contract includes resurfacing, these tolerances shall be plus or minus 1/4 inch. The cross-slope of the planed surface shall conform to the specified cross-slope within plus or minus 3/8 inch in ten feet.

3.4 METHOD OF MEASUREMENT

- A. The quantity of pavement planing including the removal and disposal of cuttings shall be the number of square yards planed.
- B. The quantity of surface patching shall be the number of square yards patched including tack coat and asphalt concrete.

3.5 PAYMENT

- A. See "Basis of Payment."

END OF SECTION 320116.71

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

ITEM 407 TACK COAT, TRACKLESS TACK, INTERMEDIATE AND SURFACE COURSE

Description: This work consists of preparing and treating a paved surface with NTSS-1HM Trackless Tack produced by Blacklidge Emulsions, Inc. Meet all requirements of Construction and Material Specifications Item 407 Tack Coat except as noted below.

Material: Conform to the following typical physical properties:

Parameter	Test Method	MIN.	MAX.
Saybolt Furol Viscosity, SFS @ 25C	AASHTO T59	15	100
Storage Stability, 25 hours, %	AASHTO T59	---	1
Storage Stability, 5 days, %	AASHTO T59	---	5
Residue by Distillation, %	AASHTO T59	50	---
Oil Distillate, %	AASHTO T59	---	1
Sieve Test, %	AASHTO T59	---	0.30
Test on Residue:			
Penetration, @ 25C	AASHTO T49	---	20
Softening Point Range Deg. C	AASHTO T53	65	---
Solubility, %	AASHTO T44	97.5	---
Original Binder DSR @ 82C G*/SIN 8, 10 rad/sec	AASHTO T315	1.00	---

Note: Product should not contain filler such as clay, etc. Keep from freezing. Supply certified test data from an independent lab to the Engineer showing the material supplied was tested for and meets the above properties.

Equipment. All requirements of 407.03 apply. See manufacturer's representative for correct distributor settings. Thoroughly clean all equipment if cationic emulsion was previously used.

Weather Limitations. All requirements of 407.04 apply.

Preparation of Surface. All requirements of 407.05 apply.

Application of Asphalt Material. Uniformly apply the asphalt material with a distributor per the requirements of 407.06 except as noted. If product is stored for an extended period of time, prior to application, agitate or gently circulate the material. All nozzles and spray patterns shall be identical to one another along the distributor spray bar. The angle of the nozzle should be at a 15 to 30 degree angle to the spray bar axis to maximize overlap or as recommended by the nozzle manufacturer. Contact the manufacturer's representative for required spray nozzle size, and distributor and nozzle settings. Apply at a rate of 0.04 to 0.08 gallons per square yard. Recommended application temperature is 160°F. to 180°F. Do not exceed 180°F. Dilution is not allowed.

The Engineer and manufacturer's representative will approve rate of application, temperature, distributor settings, and areas to be treated before application of the tack coat. The Engineer will determine the actual application in gallons per square yard by a check on the project. The application is considered satisfactory when the material is applied uniformly with no visible evidence of streaking or ridging and the application rate is $\pm 10\%$ of the specified rate.

Contact Julia Miller, Office of Construction Administration if any placement or field performance issues exist.

Method of Measurement. All requirements of 407.07 apply.

Basis of Payment. All requirements of 407.08 apply.

Usage Guidelines

Trackless Tack

The Ohio Department of Transportation

August 2, 2010

Who:

The Ohio Department of Transportation (ODOT) is providing these guidelines for the use of a proprietary product for its tack coat used to bond bituminous asphalt pavement courses. This product will be used by ODOT Contractors on projects selected based on specified parameters. These guidelines are for use by designers/engineers who are preparing plans that include ODOT Construction and Materials Specification (C&MS) Item 407 Tack Coat. Although primarily to be used during plan preparation, these guidelines can be used for "already sold" projects when Trackless Tack is being considered to reduce tracking issues.

What:

Trackless Tack, NTSS-1HM is a proprietary product produced by Blacklidge Emulsions. This product provides equal performance regarding bond strength as does ODOT's standard specified tack coat (Item 407). However, NTSS-1HM provides a trackless coating within approximately 10 minutes.

When:

NTSS-1M Trackless Tack will be used when the cure time of Item 407 Tack Coat is deemed problematic for construction sequencing and therefore tack pick up occurs.

Why:

NTSS-1M Trackless Tack provides a safer work zone by eliminating tracking of slippery emulsified asphalt material (tack) onto adjacent roadways.

Where:

NTSS-1M trackless Tack can be used on any project that may have safety-related issues with tracked tack material, particularly those with temporary lane closures. The use of Trackless Tack should be considered for project conditions that typically do not allow adequate time for proper cure of standard tack. Designers are required to evaluate each project on a case-by-case basis for potential safety-related concerns that would arise from tracking of tack onto adjacent roadways. Construction sequencing, roadway configuration, traffic volumes, and paving hour restrictions, among other factors, must be considered and evaluated before specifying Trackless Tack. The designer/engineer shall use best-engineering practices to decide whether Trackless Tack use on a specified project is warranted.

The following project conditions can be used as a guide to help determine applicability.

Short Construction Zones

Short construction zones do not allow sufficient tack cure time and perpetuate tack pick up and tracking. Temporary construction zones are often kept as short as possible by paving contractors to alleviate issues with multiple cross roads and intersections that must be utilized by the traveling public during paving operations. Traffic crossing and turning movements will pick up and track uncured tack to the adjacent roadways and therefore, contractors tend to keep zones shorter for better and safer traffic control.

Urban Paving

Paving in municipalities requires short construction zones in order to effectively control traffic due to high traffic counts, multiple cross streets, shopping areas, and driveways that create congested conditions. Tack pick up and tracking is exacerbated in urban areas. Additionally, many cities and towns have restricted paving hours that also necessitate short zones.

Night Paving

Many interstate and interstate look-alike projects are restricted to paving only during night time hours. Night time temperatures are typically lower and dew points are higher resulting in long tack cure times. Since penalties are often assessed for exceeding nightly closure times, Contractors will not apply tack too far in front of the paver. This allows the Contractor to manage risk associated with equipment and plant production issues. This type of sequencing often does not allow time for tack to sufficiently cure and delivery trucks track the material into the high speed lanes.

The use of Trackless Tack may be appropriate for project conditions other than those listed. The designer/engineer can best determine whether the use of trackless tack will improve safety on a subject project by examining all variables.

How:

The use of NTSS-1M Trackless Tack shall be incorporated into plans using a plan note.

The following separate pay items will be used:

- Item 407E20000, Tack Coat, Trackless Tack, Intermediate Course
- Item 407E20100, Tack Coat, Trackless Tack, Surface Course

Design application rate will be the same as standard C&MS Item 07 Track Coat.

The use of Trackless Tack will be monitored using these Item numbers. Information that will be collected includes project type, location and quantity.

SECTION 321216 - ASPHALT CONCRETE PAVING AND MATERIALS

SECTION 1 - MATERIALS

- 1.1 The asphalt concrete mixture and installation thereof shall meet Ohio Department of Transportation (ODOT) Specifications except as modified in these specifications.
- 1.2 In the ODOT Specifications substitute "Engineer" for "Department" (except as stated below in reference to ODOT 403 for Department VA testing and acceptance).
- 1.3 No steel slag shall be used as coarse or fine aggregate for any asphalt concrete.
- 1.4 All asphalt cement utilized on this project shall meet AASHTO Provisional Standard MP1 or any superseding AASHTO specification for performance graded asphalt cement binder in conformance with PG 64-22.
- 1.5 The following exceptions shall be made for the Asphalt Concrete Surface Course:
 - A. The coarse aggregate material shall be only limestone
 - B. Recycled Asphalt Product (R.A.P.) will be permitted per ODOT 401.04 with the following exception: Maximum 0% R.A.P. for all surface courses and 25% R.A.P. for all intermediate courses.
 - C. The contractor shall provide documentation and certification to verify the above.
- 1.6 Except where designated otherwise in the plans or specifications all asphalt concrete mixes shall be designed for medium traffic volumes. Where light or heavy traffic pavements are designated in the plan, the contractor shall use an asphalt concrete mix designed for such traffic conditions.
- 1.7 Acceptance of the mixture will be based upon the certification that the mixture was produced according to the approved JMF within the production control and composition tolerances of the specifications. The Contractor shall hire and pay for an independent testing lab approved by the Engineer to perform all sampling, testing, monitoring, analysis and certification required by the Laboratory, Monitoring Team or Department in ODOT 403 and 441. All work by the independent laboratory shall be performed by personnel with ODOT Level II Bituminous Concrete certification.
- 1.8 ODOT 401.20 - "Asphalt Binder Price Adjustment" shall not apply to this contract.
- 1.9 Monument box and valve box risers shall be East Jordan Iron Works No. 8626, No. 8631, or approved equal. The Contractor shall follow the manufacturer's recommended installation procedure. New manhole frames and grate or frame and cover shall be EJIW 1710.
- 1.10 Brick used for manhole, catch basin, or inlet basin castings adjusted to grade under ODOT 611.10 Method D.1. shall be red shale or clay sewer brick meeting the requirements of ASTM C32 sewer brick, grade SM.

- 1.11 Risers used for manhole castings adjusted to grade under ODOT 611.10 Method D.2. shall be manufactured by Manhole Systems, Model MS-101TB, or approved equal.
- 1.12 All materials delivered to this project must have been weighed on a platform scale with electronic imprinter to show gross, tare, and net weights. No payment will be made for materials which are not correctly weighed as necessary. Material weight shall not exceed the current legal allowable limit.
- 1.13 Unless specified elsewhere in the specifications, material for berms shall be limestone only. Recycled concrete and asphalt concrete will not be permitted.

SECTION 2 - PAVING EQUIPMENT

- 2.1 All spreading equipment shall be self propelled. The Contractor shall identify the make and model of the paving machine that will be used for the intermediate and surface courses for approval prior to the pre-construction meeting.
- 2.2 All equipment, tools, and machines used in the performance of this work shall be maintained in satisfactory working order at all times. The Contractor shall be prepared to furnish proof of certification that all equipment to be used on the project has been calibrated within the past six (6) months.

SECTION 3 - GENERAL - PAVING

- 3.1 All paving shall be done on a single-lane basis.
- 3.2 If traffic loop detectors are encountered and broken, the Contractor is to repair as per local specifications. The cost for this work will be paid under the loop detector replacement bid item, if any; at negotiated unit prices; or by time and materials as directed by the Engineer.
- 3.3 Tack Coat, Item 407, shall be applied at the rate of from 0.05 to 0.15 gallons per square yard as appropriate for the surface conditions with sand cover if required.
- 3.4 Driveway aprons shall be matched to new pavement with 24" transition sections or as shown on the drawings or required by the Engineer. The Contractor shall install apron wedge as required in the detailed drawings.
- 3.5 Unless otherwise shown on the drawings, jointing of new to existing pavement shall be by milled butt joints six (6) feet in width (or as shown on the plans) from edge of pavement to edge of pavement. Depth of this milled area shall equal the total of subsequent intermediate course and surface course as specified.
- 3.6 One (1) copy of each hauled/weighed material truck load ticket (plant ticket) for materials incorporated in this project shall be provided to the project representative daily. If a partial load is used, the Contractor's foreman and the project representative shall confer and come to an agreement as to what portion of the product was used. The percent of material of this load, as reported by the project representative, is what shall be recorded as utilized.

- 3.7 For variable depth courses where tonnage tickets are used for determining quantities for payment, the conversion to cubic yards shall be number of tons verified and approved by the Engineer divided by 2.00 regardless of the actual density of the mix.
- 3.8 Positive drainage is to exist subsequent to the completion of the surface course. The Contractor shall take any necessary measures to assure positive drainage of the surface course. It shall be the responsibility of the Contractor to repair any low/puddled areas at his own cost by milling out the affected areas to a minimum depth equal to the nominal depth of the course being repaired and replacing with the specified asphalt concrete to grades that will correct the drainage problem.
- 3.9 Surface tolerances for all completed surface courses shall be as noted in ODOT 401.19. This tolerance shall apply regardless of whether or not an intermediate course is installed.
- 3.10 At the direction of the Engineer, periodic weight checks of asphalt concrete in loaded trucks shall be made by the Contractor and verified by the Engineer.
- 3.11 All quality control testing data performed on material incorporated into this project shall be forwarded to the Engineer for review as soon as it is available.
- 3.12 Quantity verification (but not necessarily payment quantity) for all asphalt concrete incorporated into the work shall be by weight tickets as produced by the plant or supplier or other means approved by the Engineer. Tack coat shall be verified by a ticket filled out and signed by the Contractor's tack truck driver based on weights taken or observations of level indicators. All verification tickets are required to be submitted to the Engineer on the day the material is incorporated into the work; however, the Engineer may, at his sole discretion, accept verification tickets for any items up to seven (7) calendar days subsequent to the work being performed. **After that date additional verification tickets for material will not be accepted for consideration of payment.**
- 3.13 No work is to be performed without the presence of the Engineer or his designated Project Representative. Forty-eight (48) hour advance notice of work shall be given to the Engineer and Owner by the Contractor.
- 3.14 When any surface course or intermediate course is placed on a new intermediate course while that course is still clean and within ten (10) days of installation of that course, a tack coat will not be required. When any surface course or intermediate course is placed on a new intermediate course that is not clean or is not placed within ten (1) days after installation of that course, the Contractor shall provide a tack coat, Item 407, at his own expense, as directed by the Engineer.
- 3.15 All edges of surface courses abutting curbs or other appurtenances shall be sealed with hot AC-20.

END OF SECTION 321216

SECTION 321216.10 - VOID REDUCING ASPHALT MEMBRANE (VRAM)

PART 1 - GENERAL

As part of this project, the Contractor will be required to construct sections of cold longitudinal joints using Void Reducing Asphalt Membrane (VRAM) material at specified locations. Provide additional core samples, loose mix samples and liquid material samples as directed by the Engineer. Construct all surface course cold longitudinal joints per a typical section using VRAM material and conforming with the following requirements.

Materials. Provide J-bank produced by Asphalt Materials, Inc. or other approved asphalt material as follows:

Provide a base asphalt modified with styrene-butadiene diblock or triblock copolymer without oil extension, or a styrene-butadiene rubber elastomer. Do not use air-blown asphalt, acid modification, or other modifiers.

Test	Test Requirement	Test Method
Dynamic shear @ 82°C (unaged), G*/sin δ , kPa	1.00 min.	AASHTO T 315
Creep stiffness @ -18°C (unaged), Stiffness (S), MPa m-value	300 max. 0.300 min.	AASHTO T 313
Ash, %	6.0 max.	AASHTO T 111
Elastic Recovery, 100 mm elongation, cut immediately, 25°C, %	58 min.	AASHTO T301
Separation of Polymer, Difference in °C of the softening point (ring and ball)	3 max.	ASTM D7173, AASHTO T 53
Migration of VRAM, %	50-75	ITM XYZ

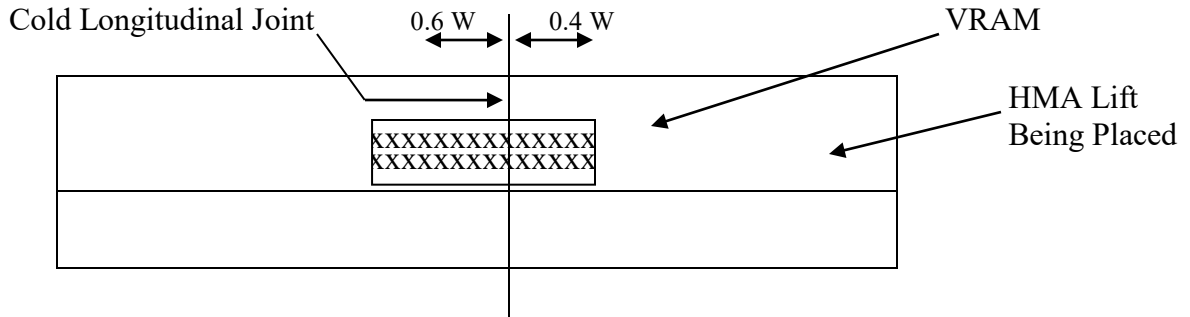
Equipment. When a pressure distributor is used to apply the VRAM, equip the distributor with a heating and recirculating system along with a functioning auger agitating system or vertical shaft mixer in the hauling tank to prevent localized overheating.

When a melter kettle is used to transport and apply the VRAM, use only oil jacketed double-boiler melter kettles with agitating and recirculating systems. Material from the kettle may be dispensed through a pressure feed wand with an applicator shoe or through a pressure feed wand into a hand-operated “thermal push cart.”

Preparation of Surface. Prior to placing VRAM, clean the pavement surface area to be treated of all foreign materials deemed detrimental by the Engineer. Only apply VRAM to surfaces that are dry and cleaned of all dust, debris, and any substances that will prevent the VRAM from adhering. The VRAM may be placed before or after the tack coat placement. When placed after the tack coat, ensure the tack coat is fully cured prior to placement of the VRAM.

Application of VRAM. Apply VRAM to cold longitudinal joints under surface courses. Only apply VRAM when the pavement surface temperature and the ambient temperature are a minimum of 40°F and rising.

Apply VRAM material on the cold longitudinal joint as detailed below:



Apply VRAM at the width and application rate required according to the following table:

VRAM Application Rate Table		
Overlay Thickness, (in.)	VRAM Width, "W", (in.)	Application Rate ^[1] , (lb./ft.)
HMA Mixtures ^[2]		
1	15	0.95
1-1/4	15	1.09
1-1/2	15	1.22
1-3/4	15	1.36
2	15	1.49
2-1/4	15	1.62
2-1/2	15	1.76
2-3/4	15	1.89
3	15	2.03
3-1/4	15	2.16
3-1/2	15	2.30
3-3/4	15	2.43
4	15	2.57
SMA Mixtures ^[2]		
1-1/2	12	0.83
1-3/4	12	0.92
2	12	1.00

^[1] The application rate has a surface demand for liquid included within it. The nominal thickness of the VRAM may taper from the center of the application to a lesser thickness on the edge of the application. The width and weight/foot shall be maintained.

^[2] In the event of a joint between an SMA and HMA mixture, the SMA application rate will be used.

Apply VRAM in a single pass with a pressure distributor, melter kettle, or hand-applied from a roll, for asphalt courses up to 1 in. (50 mm) in thickness. Apply VRAM in two passes for asphalt courses between 2 and 4 in. (50 and 100 mm) in thickness. Ensure the applied width of VRAM is within ± 1.5 in. (38 mm) of the width specified. If the VRAM flows more than 2 in. (50 mm) from the initial placement width, immediately stop placement of VRAM and perform corrective actions. Coordinate the application of VRAM and placement of the asphalt mixture to ensure the center of the VRAM application is within ± 2.0 in. (50 mm) of the center of the asphalt pavement cold joint being constructed.

If the VRAM material will be exposed to traffic prior to closing the longitudinal joint, shift the location of the centerline of the VRAM material about the joint centerline such that no more than a nominal 6 in. (152 mm) of material is exposed. Do not open to traffic if width of exposed VRAM material is greater than 6 in. (152 mm).

If the paving operation only allows VRAM to be placed on one side of the cold longitudinal joint at a time, coat the vertical face of the cold longitudinal joint with VRAM material in addition to the requirements above. Do not seal the face of cold longitudinal joints as required per 401.17 when using VRAM for the cold longitudinal joint.

Furnish a bill of lading for each tanker supplying material to the project. Verify the application rate of VRAM within the first 1,000 ft. (305 m) of the day's scheduled application length and every 6,000 ft. (1,829 m) the remainder of the day. For projects less than 3,000 ft. (914 m), the rate will be verified once. Place a suitable paper or pan at a random location in the path of the placement for the VRAM. After application of the VRAM, pick up the paper or pan and obtain the weight of material. Calculate the weight per foot of VRAM. Ensure the actual weight per foot of VRAM is within ± 15 percent of the target weight/foot from the VRAM Application Rate Table. Replace the VRAM in the areas where the samples are taken.

When beginning placement of a run of VRAM, use a suitable release paper to cover previous VRAM application to prevent doubling up of thickness of VRAM.

The VRAM must be suitable for construction traffic to drive on without pickup or tracking within 30 minutes of placement. If pickup or tracking occurs, immediately stop placement of VRAM and repair damaged areas.

Prior to start of paving, ensure the paver end plate and any grade control devices are adequately raised above the finished height of the VRAM.

Immediately stop placement of asphalt mixture and VRAM if flushing is noted in the asphalt surface. Do not continue placement of the asphalt mixture until the issue is corrected.

END OF SECTION 321216.10