GENERAL NOTES:

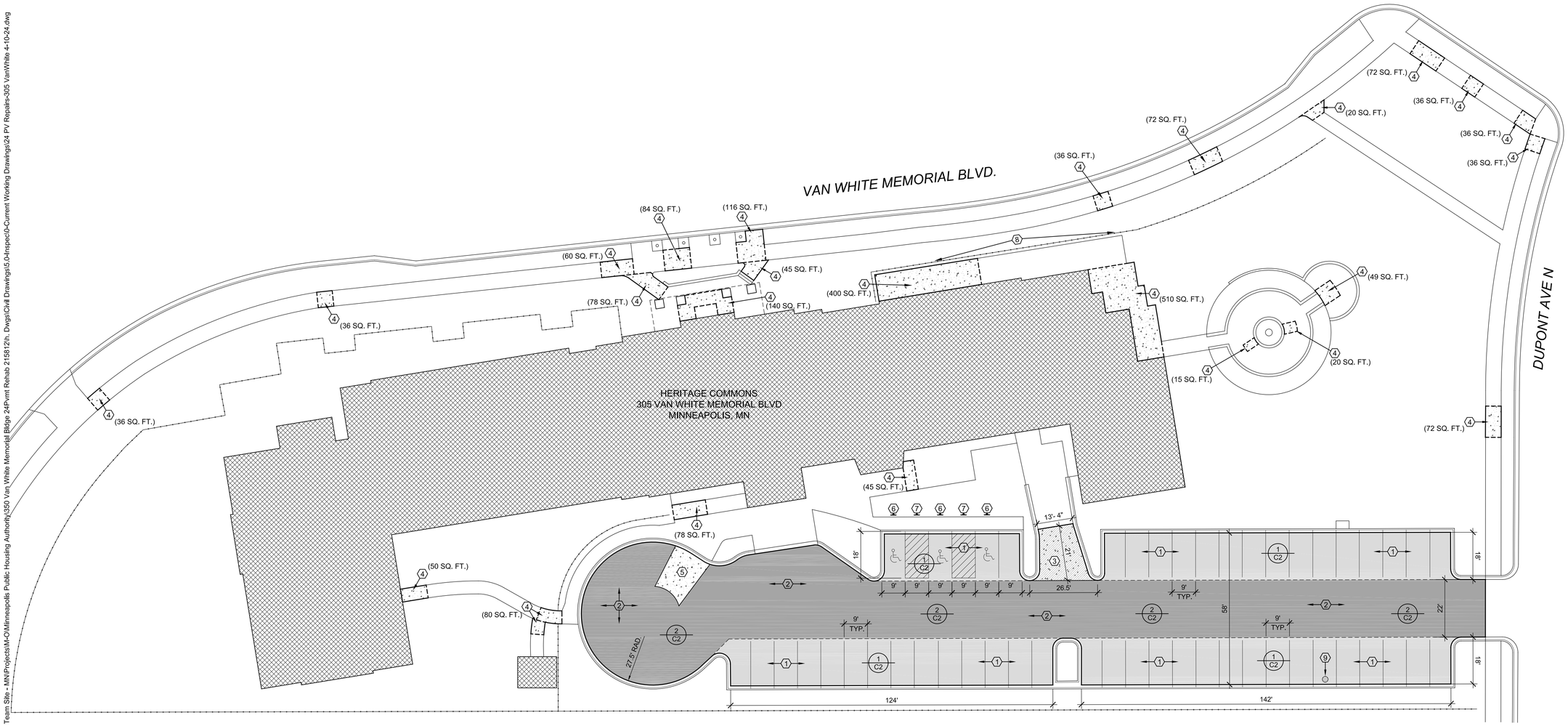
1. COORDINATE ALL WORK IN ADVANCE WITH OWNER.
2. CONTRACTOR RESPONSIBLE FOR LOCATING, VERIFYING, AND PROTECTING ALL SITE UTILITIES. CONTACT GOPHER STATE ONE CALL AND CONTRACT THE SERVICES OF A PRIVATE LOCATOR PRIOR TO ANY EXCAVATION. CONTRACTOR SHALL BE RESPONSIBLE FOR AND PAY FOR REPAIR OF ANY DAMAGED UNDERGROUND UTILITIES DAMAGED DURING CONSTRUCTION.
3. PROTECT EXISTING STORM SEWER INLETS AND SYSTEMS AGAINST SEDIMENTATION AS A RESULT OF CONSTRUCTION RELATED DIRT AND DEBRIS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
4. CONCRETE WASHOUT SHALL BE PERFORMED ON THE CONCRETE TRUCK. IN LIEU OF WASHING ON THE TRUCK, THE CONTRACTOR MAY ELECT TO PROVIDE AND MAINTAIN AN ON-SITE CONCRETE WASHOUT CONTAINER, COMPLIANT WITH REGULATORY AGENCY REQUIREMENTS, FOR ALL CONCRETE WASTE AND WASH WATER. CONTRACTOR SHALL PROVIDE SIGNAGE ADJACENT TO THE WASHOUT FACILITY AND OVERSEE AND ENFORCE CONCRETE WASTE MANAGEMENT PROCEDURES.
5. CONTRACTOR IS REQUIRED TO PROVIDE, PLACE, AND MAINTAIN VISIBLE BARRIERS AND SIGNAGE AS REQUIRED TO KEEP UNAUTHORIZED PERSONNEL OUT OF CONSTRUCTION AREAS AND ACTIVE WORK ZONES.
6. ALL CONSTRUCTION MUST COMPLY WITH APPLICABLE ORDINANCES.
7. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL CONSTRUCTION PERMITS.
8. MAINTAIN THE PROPERTY, ADJACENT PROPERTIES, AND ADJACENT STREETS CLEAN FROM CONSTRUCTION CAUSED DIRT AND DEBRIS. SITE PAVEMENTS AND ADJACENT STREETS MUST BE SWEPT ON A DAILY BASIS AND ADDITIONALLY AS DIRECTED BY THE ENGINEER, OWNER, OR CITY, WITH A PICK UP SWEEPER EQUIPPED WITH WATER OR EQUAL TO REMOVE ANY ACCUMULATED SOIL MATERIAL.
9. PROTECT EXISTING FACILITIES, PAVEMENT SYSTEMS, AND VEGETATION THAT ARE SCHEDULED TO REMAIN IN CONSTRUCTION ACCESS AND STAGING AREAS. RESTORE ALL DISTURBED AREAS, INCLUDING PAVEMENTS, LANDSCAPING, AND LAWN AREAS TO ORIGINAL CONDITION.

KEYED NOTES:

1. REMOVE AND DISPOSE OF EXISTING BITUMINOUS PAVEMENT (SHADED). GRADE AND COMPACT EXISTING BASE AGGREGATE TO PROVIDE POSITIVE SURFACE DRAINAGE AND ACCOMMODATE NEW PAVEMENT SECTION. PLACE NEW BITUMINOUS PAVEMENT IN TWO LIFTS AND IN ACCORDANCE WITH DETAIL 1/C2. STRIPE PARKING STALLS, DISABILITY PARKING INSIGNIAS, AND DISABILITY ACCESS AISLES AS SHOWN.
2. REMOVE AND DISPOSE OF EXISTING BITUMINOUS PAVEMENT (SHADED). GRADE AND COMPACT EXISTING BASE AGGREGATE TO PROVIDE POSITIVE SURFACE DRAINAGE AND ACCOMMODATE NEW PAVEMENT SECTION. PLACE NEW BITUMINOUS PAVEMENT IN TWO LIFTS AND IN ACCORDANCE WITH DETAIL 2/C2.
3. SAWCUT AND REMOVE EXISTING BITUMINOUS PAVEMENT. PLACE AND COMPACT NEW BASE AGGREGATE AND CONSTRUCT NEW PORTLAND CEMENT CONCRETE IN ACCORDANCE WITH DETAIL 3/C2.
4. SAWCUT, REMOVE, AND DISPOSE OF DAMAGED CONCRETE SIDEWALK PANELS MARKED IN THE FIELD. DRILL 6" INTO ABUTTING CONCRETE PANELS SCHEDULED TO REMAIN, MID-SLAB, AND INSERT 12" LONG, #4 EPOXY COATED SMOOTH DOWELS, SPACED 18" O.C. PLACE AND COMPACT NEW BASE AGGREGATE AND CONSTRUCT NEW PORTLAND CEMENT CONCRETE IN ACCORDANCE WITH DETAIL 4/C2.
5. REMOVE EXISTING CONCRETE SLAB AND CONSTRUCT NEW IN ACCORDANCE WITH DETAIL 3/2.
6. SALVAGE AND RELOCATE EXISTING DISABILITY PARKING SIGN AND POST (3 TOTAL) AND INSTALL IN LOCATION SHOWN AND IN ACCORDANCE WITH DETAIL 5/C2.
7. PROVIDE AND INSTALL (2 TOTAL) NEW "NO PARKING ACCESS AISLE" SIGN AND POST IN LOCATION SHOWN AND IN ACCORDANCE WITH DETAIL 5/C2.
8. CONTRACTOR TO DRIVE POSTS ON EXISTING BLACK ORNAMENTAL FENCE AS NEEDED TO LEVEL FENCE.
9. PROVIDE INLET PROTECTION AT EXISTING CATCH BASIN INLET TO PROTECT STORM DRAINAGE SYSTEMS AGAINST SEDIMENTATION AS A RESULT OF CONSTRUCTION RELATED DIRT AND DEBRIS. MONITOR AND REMOVE ACCUMULATED SEDIMENT/DEBRIS AS REQUIRED TO PREVENT PONDING OF WATER. REMOVE INLET PROTECTION FOLLOWING FINAL SITE STABILIZATION.

LEGEND:

- EXISTING BUILDING
- MEDIUM-DUTY BITUMINOUS PAVEMENT (REFER TO DETAILS AND KEYED NOTES)
- HEAVY-DUTY BITUMINOUS PAVEMENT (REFER TO DETAILS AND KEYED NOTES)
- EXISTING CONCRETE PAVEMENT TO BE REMOVED AND REPLACED (REFER TO KEYED NOTES)
- EXISTING BITUMINOUS PAVEMENT TO BE RECONSTRUCTED WITH CONCRETE PAVEMENT (REFER TO KEYED NOTES)



SITE PLAN

0 10' 20' 40'

SCALE: 1" = 20'-0"

NORTH

INSPEC

5801 Duluth Street
Minneapolis, MN
55422
Ph. 763-546-3434

MINNEAPOLIS | ROCHESTER | MILWAUKEE | CHICAGO

Consultants:

Signature:

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE: Brenton E. Boelter

TYPED OR PRINTED NAME: BRENTON E. BOELTER

DATE 4/10/24 REGISTRATION NO. 26877

Issues and revisions:

ISSUE LEVEL / REVISION:	DATE:	No.:

THIS LINE SCALES 1" ON FULL SIZE SHEETS

Client:

MINNEAPOLIS
PUBLIC HOUSING
AUTHORITY

1001 WASHINGTON AVENUE NORTH
MINNEAPOLIS, MINNESOTA 55401

HERITAGE COMMONS

350 VAN WHITE MEMORIAL BOULEVARD
MINNEAPOLIS, MINNESOTA 55401

Project title:

2024 PAVEMENT
REHABILITATION AND REPAIRS

350 VAN WHITE MEMORIAL BOULEVARD
MINNEAPOLIS, MINNESOTA 55401

Sheet content:

SITE PLAN

DATE:	04/10/24
CLIENT PROJECT No.:	
INSPEC PROJECT No.:	215812
PROJECT MGR:	MDR
DRAWN BY:	BJT
CHECKED BY:	BEB

Sheet No.:

C1

SHEET SIZE: 24x36

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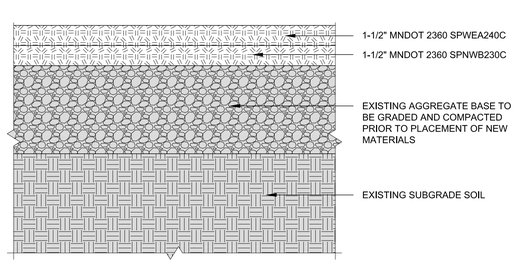

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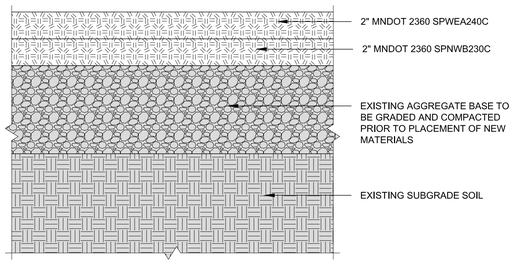

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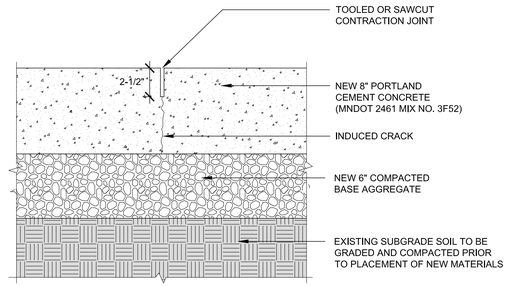
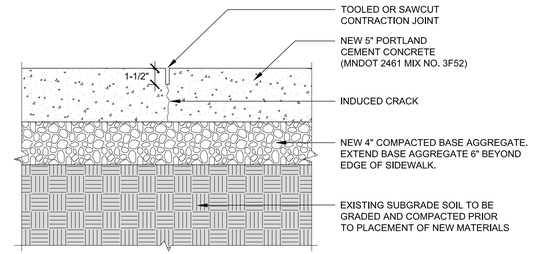


3 C2 CONCRETE PAVEMENT DETAIL
NO SCALE

NOTE:
IN LOCATIONS WHERE NEW CONCRETE ABUTS EXISTING CONCRETE PAVEMENT SCHEDULED TO REMAIN, DRILL 6" INTO EXISTING CONCRETE PAVEMENT, MID-SLAB, AND INSERT 12" LONG, #4 EPOXY COATED SMOOTH DOWELS, SPACED 18" O.C.



4 C2 CONCRETE SIDEWALK DETAIL
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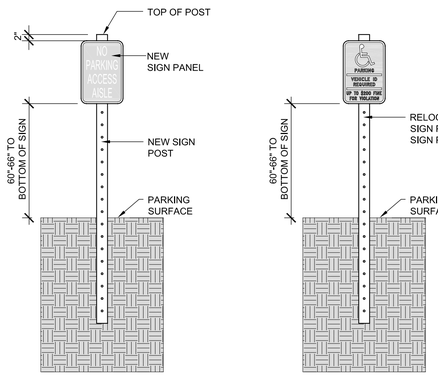

ACCESS AISLE

DISABILITY PARKING

5 C2 PARKING SIGN DETAILS
NO SCALE

INSPEC
5801 Duluth Street
Minneapolis, MN
55422
Ph. 763-546-3434

MINNEAPOLIS | ROCHESTER | MILWAUKEE | CHICAGO

Consultants:

Signature:

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Sheet content:

DETAILS

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PROJECT MGR:	MDR
DRAWN BY:	BJT
CHECKED BY:	BEB

Sheet No.:

C2

SHEET SIZE: 24x36

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SECTION 10 14 53
TRAFFIC SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Traffic sign panels

PART 2 - PRODUCTS

2.1 FABRICATION, COLOR, AND MATERIALS

A. Fabrication of traffic signs and markers: Conform to the Minnesota Manual for Uniform Traffic Control Devices for Streets and Highways.

B. Colors: Conform to color tolerance charts available from the Federal Highway Administration, Department of Transportation, Washington D.C., unless otherwise permitted or specified herein.

C. Sign base material: Steel or aluminum, showing no wind or twist, and when mounted, the finished sign will lay flat against the post or mounting structure.

D. Steel post: Galvanized flanged channel, bars, or rectangular hot rolled tube of structural quality with a minimum weight of 3 pounds per foot.

2.2 REGULATORY SIGNS

A. Regulatory signs shall meet the following criteria for "R" series:

Sign No.	Name	Size	Color
---	No Parking Access Aisle	12" x 18"	White on Blue

PART 3 - EXECUTION

3.1 EXECUTION

A. Perform no work on the job site until all underground utilities are located. Replace damaged electrical cable between hand holes. Do not splice underground. Damage to underground utilities shall be repaired at Contractor's expense.

B. Sign locations on the Drawings are approximate only. Final determination of sign locations will be made in the field by the Engineer.

C. Posts shall be plumb above ground. Posts that are bent or otherwise damaged, as determined by the Engineer, shall be removed from the site and replaced at Contractor's expense.

D. Posts shall be firm in the ground. After driving, the top of the post shall have substantially the same cross-sectional dimensions as the body of the post. No battered heads will be accepted. No additional compensation will be made for setting posts that cannot be driven.

END OF SECTION

SECTION 31 23 16
EXCAVATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Excavation for site pavements and site amenities

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 UTILITIES

A. Locate existing public and private underground utilities in areas of Work. The utilities shown, if any, on the Drawings are approximate locations only. Provide adequate means of protection during excavation operations. Properly cap, raise, or lower to grade existing valve covers, cleanouts, manholes, drop inlets, or other utilities in areas of work.

B. Consult utility owner immediately for directions if uncharted, or incorrectly charted piping or other utilities are encountered during excavation. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. The Contractor shall repair damaged utilities to the satisfaction of the utility owner at no expense to the Owner.

C. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, except when permitted in writing by Engineer.

3.2 USE OF EXPLOSIVES

A. The use of explosives is not permitted.

3.3 EXCAVATION

A. Remove topsoil, sod, grass, organic materials, or other unsuitable soil from areas to receive new materials.

B. Sawcut existing pavement to be removed full depth to form a smooth vertical edge and without cracking or distress to the pavement to remain. Remove where indicated on the Drawings or as marked in the field by the Engineer.

1. Pavement face shall be intact and unraveled.
2. Protect edge from damage from traffic.

C. Excavate areas to the depth shown on the Drawings. After the required excavation has been completed, thoroughly clean the exposed vertical and bottom surfaces of all loose materials. The excavation bottom shall be firm and dry.

D. Do not allow water to accumulate in excavations. Remove water to prevent softening of subgrade or foundation soils or to eliminate other changes detrimental to stability of subgrades. Provide and maintain surface drainage and other dewatering system components necessary to convey water away from excavations.

E. For excavation for subgrade, conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet.

F. All work specified in this Section shall be performed by the Contractor at his own expense unless ordered by the Engineer. Additional payment will be made under separate unit price bid items for over-excavation if such bid item has been established; otherwise payment will be made in accordance with a negotiated price.

G. Use all means necessary to prevent operations from producing dust. The Contractor shall be responsible for damage resulting from dust originating from his operation.

3.4 OVER-EXCAVATION NOT ORDERED, SPECIFIED OR SHOWN

A. Excavation carried below the grade not ordered, specified, or shown, shall be backfilled to the required grade with the specified material and compaction. Such work shall be performed by the Contractor at his own expense.

3.5 DISPOSAL OF EXCESS EXCAVATED MATERIAL

A. Contractor shall remove and dispose of excess excavated material off-site and at their expense.

3.6 FIELD QUALITY CONTROL

A. Inspections will be performed during excavation for verification of excavation cross-section.

END OF SECTION

SECTION 31 25 13
EROSION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Inlet protection
   2. Sediment control logs
   3. Dust control
   4. Municipal (local regulating authority) permits

1.2 SUBMITTALS

A. Submit to the Engineer certification from the manufacturers and/or producers that materials used in the Work meet the minimum requirements listed below.

PART 2 - PRODUCTS

2.1 INLET PROTECTION

A. Provide inlet protection in accordance with MN/DOT 3891.

B. Products shall be sized for the specific structures being protected.

C. Approved Products:
   1. Road Drain Top Slab, manufactured by WIMCO
   2. Road Drain Curb & Gutter, manufactured by WIMCO
   3. Dandy Bag, manufactured by Dandy Products
   4. Dandy Sack, manufactured by Dandy Products
   5. Dandy Curb Sack, manufactured by Dandy Products
   6. InfraSafe Debris Collection Device, manufactured by Royal Environmental Systems, Inc.
   7. InfraSafe Sediment Control Barrier, manufactured by Royal Environmental Systems, Inc.
   8. Straw wattles
   9. Approved equal

D. Provide all required accessory materials recommended by the manufacturer for installation.

2.2 SEDIMENT CONTROL LOGS

A. Provide 12" to 18" diameter sediment control logs composed of 100% agricultural straw fiber wrapped in UV stabilized synthetic tubular netting.

2.3 DUST CONTROL

A. Dust control measures/products shall not contain asphalt based products or products that are environmentally incompatible.

B. Water that is applied to minimize dust from being generated shall be potable (or as otherwise approved) and suitable for plant growth.

PART 3 - EXECUTION

3.1 GENERAL

A. Provide all erosion control devices per the Drawings and as required by governing authorities prior to commencement of any earth disturbing activities.

B. When required, schedule erosion control device inspections and obtain approval from local authorities prior to commencing earthwork.

3.2 INLET PROTECTION

A. Install inlet protection where shown on the drawings and in accordance with MN/DOT 3891 prior to beginning construction activities.

B. At a minimum, inspect inlet protection weekly and within 24 hours after every precipitation event that produces 0.5" of rain or more during a 24 hour period.

C. Repair or correct damaged protection when observed or as directed by Engineer and/or Owner.

D. Properly dispose of sediment deposits that accumulate on the protection fabric at a minimum once a week and when the sediment deposits will not allow water to pass through. Removed sediment shall be deposited in a suitable area and stabilized or removed from site.

E. Exercise due care to ensure sediment does not enter storm sewer systems.

F. Remove and dispose of all inlet protection materials once the disturbed area is permanently stabilized with appropriate vegetation or impervious area and is no longer susceptible to erosion.

3.3 SEDIMENT CONTROL LOGS

A. For sediment control logs placed on asphalt pavement, concrete pavement, and other hardscape surfaces, lay sediment logs flat on hardscape surface. Secure in place with sandbags or other means.

B. For sediment control logs on graded slopes:

1. Spacing shall be as follows:
    a. 0 - 2% slopes Spacing 55'-0" on-center, maximum
    b. 2.1 - 5% slopes Spacing 40'-0" on-center, maximum
    c. 5.1 - 10% slopes Spacing 30'-0" on-center, maximum
    d. 10.1 - 33% slopes Spacing 15'-0" on-center, maximum
    e. >33% slopes Spacing 10'-0" on-center, maximum
2. Embed sediment control logs 2" minimum into graded slopes and stake in place.
3. Where sediment control logs are not installed perpendicular to the slope, install J-hooks at every 2 foot vertical drop.

C. Overlap sediment logs 24" minimum at each joint and J-hook location.

3.4 DUST CONTROL

A. Provide dust control measures, as necessary, to minimize and/or prevent the surface and air transport of dust during construction.

B. Unless specific dust control measures are specified herein, Contractor shall select and implement appropriate dust control measures.

C. At a minimum, water should be applied to dust generating soils, grades, subgrades, and base aggregate areas as necessary to minimize and/or prevent dust from being generated during construction activities.

3.5 MUNICIPAL (LOCAL REGULATING AUTHORITY) PERMITS

A. Apply and pay for all required municipal and/or local regulating authority permits including, but not, limited to Erosion Control Permits, Earthwork Permits, Grading Permits, Land Disturbance Permits, etc.

B. Notify Engineer if modifications to the erosion control plan are requested by the permit issuer.

C. Coordinate necessary inspections with permit issuer and adhere to procedures required by the permit and permit issuer.

END OF SECTION

SECTION 32 11 00
BASE COURSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Aggregate base for site pavements and site amenities
   2. Structural fill and backfill for site pavements and site amenities

1.2 SUBMITTALS

A. Submit laboratory test reports indicating the proposed aggregate grading meets the requirements specified herein.

B. Submit laboratory test results indicating the proposed aggregate base material meets the minimum percent crushed as specified herein.

C. The information must be current and represent the material to be supplied to the Project site. If test information is not available from the supplier, Contractor shall make arrangements and pay for required tests.

1.3 QUALITY ASSURANCE

A. Contractor shall be responsible for source quality control testing of Project materials proposed for use on the Project.

B. In-place field density tests may be performed in accordance with ASTM D1556 or ASTM D2922.

C. Work of this Section occurring on public property shall be constructed in accordance with all laws, ordinances, rules, regulations, and orders of any public authority having jurisdiction. Where such work is required to be constructed in a manner differing from the Contract Documents, the Contractor shall notify the Architect/Engineer before proceeding with the work.

PART 2 - PRODUCTS

2.1 AGGREGATE BASE

A. Provide certified aggregate materials that have uniform appearance, texture, moisture content, and performance characteristics.

B. Imported aggregate base course materials shall meet all the quality requirements of MN/DOT 3138.
   1. Recycled materials used in base course product must meet the requirements of MN/DOT 3138.2.C and Table 3138-2.

C. Aggregate base shall be graded to conform to MN/DOT 3138 Class 5 designation and the applicable Table (Table 3138-3, Table 3138-4, or Table 3138-5) based on the percentage of recycled material in the product.

2.2 STRUCTURAL FILL AND BACKFILL

A. Processed clean, fine earth, rock, or sand, free from grass, roots, brush, or other vegetation.

B. ASTM D2487 soil classification SP, SP-SM, SM, SC, or CL with 100% material passing the 3-inch sieve, an organic content (OC) of less than 2%, and a plasticity index (PI) of less than 20%.

2.3 UNSUITABLE MATERIALS

A. Unsuitable soils include soils classified under ASTM D2487, which fall in the classification of PT, OH, CH, MH, OL, or ML.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare subgrade to provide required line and elevation.

B. Confirm that the subgrade has been prepared and is ready for fill placement.

C. Subgrade shall be in a moisture condition acceptable for fill placement.

D. Compact pavement subgrades with a minimum of three passes of compactor.

E. Confirm that there are no deficient or saturated subgrade soil conditions. Excavate, dry, and recompact saturated soils or excavate, remove, and replace at no additional cost to Owner and as approved by the Engineer

3.2 PLACEMENT

A. Deposit and spread in uniform 6" maximum thickness layers (after compaction) without segregation of size.

B. Compact each layer until there is no further evidence of consolidation using a sheep's foot roller, pneumatic tired roller, or vibratory steel roller as approved by the Engineer.

C. Mechanically compact each layer of material to the specified percentage of maximum dry density. Use equipment that is consistently capable of achieving the required degree of compaction. Compact each layer over its entire area while the material is at the required moisture content.

D. Apply water to the base material if moisture content is below optimum during the mixing, spreading, and compacting operations, when and in the amounts directed by the Engineer, as considered necessary for proper compaction.

E. Flooding, ponding, or jetting shall not be used for compaction.

F. Compact each layer of material to at least 100% of maximum dry density as determined in accordance with ASTM D698, the Standard Proctor Method.

3.3 FIELD QUALITY CONTROL

A. Quality control testing during construction: Owner's laboratory may test base course materials as construction work is performed.

1. The Contractor shall arrange for the laboratory to perform field density tests in accordance with ASTM D1556 (sand cone method) or ASTM D2922 (nuclear densometer method).
2. Laboratory shall make at least one random field density test of new materials for every 150 square yards of area for each 6" depth of material, but in no case less than one test per 12" depth.

B. Provide additional density testing if test results are below the specified density until passing test results are achieved at Contractor's expense.

C. Inspections will be performed during excavation for the following:
   1. Acceptability of natural subgrade material.
   2. Approval of fill soil, including thickness and compaction of fill layers.

END OF SECTION

SECTION 32 12 00
ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Plant mix bituminous pavement

1.2 SUBMITTALS

A. Submit a job mix formula to the Engineer at least seven days in advance of plant mix paving indicating conformance with specifications. It shall be prepared by the Minnesota Department of Transportation (MN/DOT) or a commercial laboratory and signed by a registered Professional Engineer verifying that the job mix and the mix aggregates meet the specifications contained herein.

1.3 QUALITY ASSURANCE

A. Quality assurance personnel shall remain at the Project site on a part-time basis during plant mix bituminous placement.

B. Compaction shall be by the Ordinary Compaction Method.

1.4 WARRANTY

A. Provide a warranty for paving work against failure or defects for a period of one year after final Project acceptance by the Owner. Repair or replace, to the satisfaction of the Owner, failed or defective work which occurs during the warranty period at no cost to the Owner.

PART 2 - PRODUCTS

2.1 MIXTURE DESIGNATION

A. MN/DOT 2360

1. Wear course: SPWEA240C
2. Base course: SPNWB230C

B. Refer to the Drawings

2.2 AGGREGATE FOR PLANT-MIXED BITUMINOUS PAVEMENT

A. Sound, angular stone meeting the requirements of MN/DOT 2360 and of acceptable quality and crushed to specification size.

B. The percentage of recycled asphaltic pavement materials (RAP) shall not exceed 20% for wearing and non-wearing courses.

1. RAP containing road tar, metal, glass, wood, plastic, brick, fabric, or any other objectionable material having similar characteristics will not be permitted for use in the asphalt pavement mixture.

2.3 ASPHALT BINDER MATERIAL

A. Asphalt binder material shall meet the requirements of PG asphalt binder testing tolerances, sampling rates, testing procedures, and acceptance criteria based on the most current MN/DOT Technical Memorandum, titled "Inspection, Sampling, and Acceptance of Bituminous Materials".

1. Asphalt binder grade shall be PG 58H-34

B. The percentage of asphalt binder shall conform to the job mix formula, plus or minus 0.3 percent.

2.4 ASPHALT - AGGREGATE MIXTURE (JOB MIX FORMULA)

A. The mixture shall meet the requirements listed in Table's 2360.3-B2B and 2360.3-B2C of the most current (MN/DOT 2360) plant mixed asphalt pavement gyratory design specification.

1. The job mix formula shall be approved by the Engineer.

B. The job mix formula shall be produced to conform within the parameters and limits identified in Table 2360.4-H of the most current MN/DOT Standard Specifications for Construction.

2.5 TACK COAT

A. Tack coat to be used where plant mix pavement will be in contact with previously constructed asphalt or portland cement concrete shall be CSS-1H or CRS-2 Cationic Emulsified Asphalt, diluted 50/50 with clean water as set forth in the MN/DOT 2357.

PART 3 - EXECUTION

3.1 PREPARATION

A. Plan the work to prevent damage to existing pavement that will remain.

1. Inspect and confirm that the edge of existing bituminous pavement that will receive new bituminous pavement is solid and free of cracked or distressed pavement.
2. Sawcut existing pavement, remove, and prepare as required.

B. Pavement subgrade shall be free of wet or unstable soil conditions. Do not begin paving until deficient areas have been corrected and are ready to receive paving.

C. Pavement surfaces must be dry and completely free of dust, dirt, debris, loose materials, and vegetation.

D. Apply tack coat to clean vertical surface of previously constructed asphalt or portland cement concrete which will be in contact with plant mix pavement. Distribute emulsion at a rate of 0.20 gallon per square yard of surface.

E. When a successive lift of plant mix bituminous is to be placed, the existing surface shall receive a tack coat if application of a previous layer is dirty or over 48 hours old. If dirty, surfaces shall be thoroughly cleaned prior to tack coat application.

3.2 PLANT MIX

A. Mix: Aggregate grading shall conform to the specification limits. Asphalt cement content shall be within 0.3 percent of the job mix formula optimum asphalt content.

B. The trucks for hauling bituminous mixtures shall have tight, clean, and smooth beds that have been sprayed with a minimum amount of approved anti-adhesive agent to prevent mixture adherence to the beds. Provide each truck with a cover of suitable material and size to protect the mixture from weather.

3.3 MIXTURE TEMPERATURE CONTROL

A. The minimum laydown temperature in all courses (as measured behind the paver or spreading machine) of the bituminous mixture shall be in accordance with the temperature requirements specified herein:

	Compacted Lift Thickness			
Air Temp. F	**1 inch**	**1-1/2 inch**	**2 inch**	**3 inch or more**
32 - 40		265	255	250
41 - 50	270	260	250	245
51 - 60	260	255	245	240
61 - 70	250	245	240	235
71 - 80	245	240	235	235
81 - 90	235	230	230	230
91 -	230	230	230	225

B. Plant mix bituminous mixture shall not exceed 310 F or the load will be rejected at Contractor's expense.

3.4 PLACEMENT

A. Place plant mix paving on prepared surface, spread, and strike-off. Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness. The in-place compacted thickness shall be plus or minus 1/4" of the planned thickness. Area constructed to less than the required minimum thickness may be removed and replaced by the Contractor at the discretion of the Engineer.

B. Equipment furnished by the Contractor shall be well maintained and in a sound mechanical condition capable of performing the work.

C. Paver Placing: The mixture shall be delivered to, and spread by, the plant mix bituminous paver. The mixture shall be laid in strips to minimize the number of longitudinal joints required.

D. Paver:

1. Self-contained, power-propelled unit provided with adjustable activated screed or strike-off assembly, heated, and capable of spreading and finishing courses of bituminous plant mix material in laid width applicable to the specified typical section and thickness shown on the Drawings.
2. Equip paver with a control system capable of automatically maintaining elevation as specified. The control system shall be automatically actuated from either a reference line or surface through which a system of mechanical sensors will maintain the paver screed at a predetermined slope at the proper elevation to obtain required surface. When directed, the transfer slope control system shall be made inoperative and the screed shall be controlled by sensor directed automatic mechanisms which will independently control the screed elevation from the reference line or surface.

E. Joints: Make joints between old and new pavements, or between successive days work, to ensure continuous bond between adjoining work. Construction joints shall be vertical and have the same texture, density, and smoothness as other sections of asphalt concrete course. Contact surfaces shall be clean and a tack coat applied.

F. Wear course: Place top surface wear course in maximum 2" lifts unless otherwise specified by the Engineer.

3.5 COMPACTION/ROLLING

A. Compact the plant mix bituminous mixture as quickly as possible after placement. Breakdown rolling shall immediately follow the paver. Intermediate rolling shall follow behind breakdown rolling. Compaction of the pavement shall continue until in-place air voids are within the range of

3 to 4 percent. Finish rolling shall be performed at as high a temperature as practicable and shall eliminate marks from previous rolling. Rolling must be completed before the mixture cools below 180 F.

B. Rollers:

1. Steel-wheeled: Self-propelled and capable of reversing without backlash, weighing not less than eight tons, and exerting a pressure on the rear drum of not less than 250 pounds per linear inch. When vibratory rollers are used, they shall operate at frequency of 8 to 10 impacts per foot.
2. Pneumatic-tired: Self-propelled, with a minimum of seven tires, and exerting a pressure of not less than 200 pounds per inch of rolling width.
3. Trench: Self-propelled, exerting a pressure of not less than 250 pounds per linear inch of rear roll.

C. Rolling:

1. Unless otherwise directed, begin rolling at the side and proceed longitudinally parallel to the paving lane center line, overlapping each trip half the roller width, and gradually progressing to the crown of the parking lot or roadway.
2. When pavement abuts a previous placed lane, roll the longitudinal joint first followed by regular rolling procedures.
3. On sloped sections, begin rolling at the low side and progress to the high side, by overlapping of longitudinal trips parallel to the paving lanes center line.
4. Along forms, curbs, headers, walls, and other places not accessible to rollers, thoroughly compact the mixture with hot hand tampers or with mechanical tampers.
5. The pavement shall be rolled so that no roller marks, ridges, porous spots or impressions are visible and the resulting surface has the required grade and contour.

D. Compaction shall be obtained by the Ordinary Compaction Method. Uniformly compact each course until there is no further evidence of consolidation and roller marks are eliminated. A minimum of two rollers shall be on-site at all times. A vibratory steel roller shall be used for breakdown and finish rolling and a pneumatic roller shall be used after breakdown.

E. Patching: Remove and replace paving areas mixed with foreign materials and defective areas as directed by Engineer. Cut-out and fill with fresh, hot plant mix bituminous mixture. Compact by rolling to the air voids and smoothness specified. Removal and replacement of contaminated mix shall be done at no cost to the Owner.

F. Surface smoothness: The surface of the pavement when finished shall be of uniform texture, smooth, true to crown and grade, and free from defects to the satisfaction of the Engineer. When tested with a 10-foot straight edge in any direction, the maximum deviation of the surface shall not exceed 1/8 inch. Unsatisfactory joints as determined by the Engineer will be rejected and replaced at the Contractor's expense.

G. Protection: Erect barricades to prohibit vehicular traffic on pavement after final rolling until it has fully hardened and cooled to the same temperature as the surrounding soil or original asphalt pavement.

H. Restrictions: No bituminous mixture shall be placed after November 1.

3.6 FIELD QUALITY CONTROL

A. Testing the plant mix pavement for compliance with the following Project requirements will be provided by the Owner.

Asphalt Cement Content, by weight	Mix design optimum ± 0.30%; not less than specified min.
Thickness, In.	As specified, ±1/4 inch
Surface Smoothness	±1/8 inch in 10 feet measured in any direction

B. Test frequency: Plant mix bituminous pavement shall be tested for mat thickness and surface smoothness during laydown.

END OF SECTION

SECTION 32 13 00
CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Exterior portland cement pavement and curb and gutter

1.2 SUBMITTALS

A. Submit, at least seven days in advance of placement, a Portland cement concrete mix design meeting the requirements of MN/DOT specifications. The mix design shall show the source and type of aggregate and cement; scale weight of each aggregate, cement, and water; and volume and type of admixtures per cubic yard of concrete.

B. Coarse and fine aggregate reports indicating the source, grading, specific gravity, absorption, and fineness modulus shall be submitted along with the concrete mix design at least seven days prior to placement.

1.3 QUALITY ASSURANCE

A. Quality assurance personnel may perform a complete set of tests each day concrete is placed.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT

A. Type I, II, or III, meeting the requirements of AASHTO M 85.

2.2 AGGREGATE

A. Fine Aggregate: Natural washed sand or manufactured sand, consisting of particles of sound and durable rock, meeting the requirements of MN/DOT 3126.

1. When tested in accordance with ASTM C40, the fine aggregate shall produce a color in the supernatant liquid no darker than the reference standard color solution.
2. Fine aggregate shall be well graded from coarse to fine; and, when tested by means of laboratory sieves, shall conform to MN/DOT 3126 as listed below:

Sieve Size	Percent Passing By Weight
3/8 inch	100
No. 4	95 - 100
No. 8	80 - 100
No. 16	55 - 85
No. 30	30 - 60
No. 50	5 - 30
No. 100	0 - 10
No. 200	0 - 2.5

B. Coarse Aggregate: Clean, washed, sound, durable particles, uniform in quality, and free from wood, bark, roots, and other deleterious material.

1. Coarse aggregate shall meet the deleterious and quality requirements of MN/DOT 3137.

2. Coarse aggregate shall meet the following MN/DOT grading criteria:

Percent Passing By Weight

Sieve Size	ASTM #467	ASTM #67
2 inch	100	
1-1/2 inch	95-100	
1 Inch		100
3/4 Inch	35 - 70	90 - 100
3/8 Inch	10 - 30	20 – 55
No. 4	0 - 5	0 - 10

2.3 WATER

A. Potable, clean, and free from objectionable quantities of silty organic matter, alkali, salts, and other impurities.

2.4 AIR-ENTRAINING AGENT

A. ASTM C260. Use sufficient air-entraining agent to provide a total air content of 5 to 7 percent, add to the batch in a portion of the mixing water. Batch by means of a mechanical batcher capable of accurate measurement.

2.5 ADMIXTURES

A. Admixtures will be required at the Engineer's discretion or, if not required, may be added at the Contractor's option to control the set, effect water reduction, and increase workability. In either case, the addition of an admixture shall be at the Contractor's expense. The use of an admixture shall be subject to acceptance by the Engineer. Concrete containing an admixture shall be first placed at a location determined by the Engineer. If the use of an admixture is producing an inferior end result, the Contractor shall discontinue use of the admixture. Admixtures specified herein shall conform to the requirements of ASTM C494. The required quantity of cement shall be used in the mix regardless of whether or not an admixture is used.

2.6 CONCRETE MIX DESIGN

A. Materials and construction shall be in strict accordance with MN/DOT 2461.

B. Mix number 3F52:

1. Maximum water/cement ratio: 0.45; minimum water/cement ratio: 0.30
2. Maximum cementitious content: 750 lbs/yd^3
3. Minimum 28-day compressive strength: 4,500 psi
4. Slump range: 2 to 5 inches
5. Maximum %SCM (Fly ASH/Slag/Ternary): 15/30/0
6. Air entrainment: Compatible with concrete mix. Adjust concrete mix as required for a target air content of 6.5%.

2.7 READY-MIXED CONCRETE

A. Deliver to the site and completely discharge within one hour after the addition of the cement to the aggregates or before the drum has been revolved 250 revolutions, whichever is first. In hot weather, or under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 85 F or above, the time between the introduction of the cement to the aggregates and discharge shall not exceed 45 minutes.

2.8 PREFORMED JOINT MATERIAL

A. Closed cell foam conforming to applicable sections of ASTM D1752 and ASTM D3575. Furnish in a single piece for the full depth and width required for the joint. Minimum 1/2" thick unless specified otherwise by state or local agencies.

PART 3 - EXECUTION

3.1 PREPARATION OF SURFACES

A. Prior to placing concrete, thoroughly wet soil surfaces by sprinkling. Keep surfaces moist by frequent sprinkling up to the time of concrete placement but without saturation of the subgrade. The surface shall be free from standing water, mud, and debris at the time of concrete placement.

B. Subgrade soil material shall be recompacted as required immediately prior to placing formwork for pavement and curb and gutter systems to level the surface and consolidate the soil material to a firm and dense condition.

1. Surface compact soil material with a minimum of three passes of vibratory compactor equipment.
2. Soil subgrade shall be free of soil ruts and loose soil material at the time of concrete placement.
3. If the subgrade soil conditions are disturbed following formwork placement and prior to concrete system placement, the Contractor shall recompact soil subgrade as required to ensure that concrete is placed on dense, firm, and unrutted soil.

C. Forms:

1. Forms shall be of wood, metal, or other suitable material and shall extend for the full depth of the concrete. Forms shall be straight, free from warp, and of sufficient strength to resist the pressure of the concrete without displacement. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal. Clean and coat forms with an approved form release agent before concrete placement.
2. Mark off joints and provide with expansion joints approximately 20' on-center, or extend entirely through the slab.

D. Coordinate the placement of concrete with environmental weather conditions.

1. Protect concrete from contact with water until concrete has set or a minimum of three hours after completion of finishing.

3.2 PLACING CONCRETE

A. The proportioning, mixing, and placing of the concrete shall be in accordance with the requirements for the concrete specified herein. Deposit concrete in one course to prevent segregation.

1. Concrete shall not be less than the minimum concrete section specified.

B. Consolidate placed concrete by mechanical vibrating equipment supplemented by handspading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.

C. Finish surface with a magnesium float to remove visible voids and imperfections in the surface of the concrete.
   1. Light broom the surface of the concrete to provide a uniform texture.
   2. No plastering of the surface will be permitted.
   3. Do not use steel tools for finishing the concrete surface.

D. Outside edges of the slab and all joints shall be edged with a 1/4" radius edging tool.

3.3 CURING

A. Cure concrete by a resin base membrane curing compound complying with ASTM C309. The clear compound shall be transparent and free from permanent color to result in no change in color from the natural concrete. Apply curing compound at a rate of coverage not less than 150 square feet per gallon. The compound shall contain a fugitive color dye to render the film distinctly visible on the concrete for a period of at least four hours after application.

B. Protect concrete and prohibit traffic, both pedestrian and vehicular, from freshly placed concrete for a period of not less than 72 hours for pedestrian traffic and 10 days for vehicular traffic. Heavy equipment and other heavy vehicular traffic shall be excluded for such additional time as the Engineer may direct.

3.4 PAVEMENT JOINTS

A. Contraction joints may be formed by cutting the concrete through for not less than 1/3 the depth with a pointed trowel or other suitable tool. Edge-finish the joint.

B. Contraction joints at least 1/3 of slab thickness in depth and approximately 1/8" in width may be sawed.
   1. Sawing shall be done as soon as practicable after the concrete has set sufficiently to preclude raveling during the sawing and before any shrinkage cracking takes place in the concrete and within 24 hours after concrete placement.
   2. Concrete that cracks prior to sawing shall be removed and replaced at the Contractor's expense.

C. Joints spacing shall not exceed twice the concrete thickness (in inches) in feet and with a long to short ratio not exceeding 1.5.

D. Place preformed expansion joint filler through the pavement full depth as follows:
   1. Transverse joints (joints constructed at right angles to the centerline) at uniform intervals of not more than 70'.
   2. Between pavement and building, at interface of sidewalks with concrete curbs, and around fire hydrants or other rigid structures.

3.5 CURB AND GUTTER JOINTS

A. Expansion joints (joints extending through entire section filled with 3/4" preformed filler material) shall be located about 3' either side of every catch basin inlet, at locations where tangent and radial curb and gutter meet, at locations where curb abuts rigid structures, and at least every 300' in straight sections.

B. Provide contraction joints at 10' intervals. Form to the full depth of the concrete, using 1/8" thick removable inserts conforming to the cross sectional shape of the concrete. Where practicable, such as in driveway pavement or where a curb machine is used, the contraction joints may be formed or sawed as approved by the Engineer to a depth of at least 2" from all exposed surfaces.

C. Construct joints perpendicular to the subgrade and align with similar joints in adjoining work when practicable.

3.6 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Contractor shall remove and dispose of excess materials at their own expense and in accordance with regulatory agency requirements.

3.7 FIELD QUALITY CONTROL

A. Sampling and testing for quality control during placement of concrete may include the following, as directed by the Engineer.

1. Slump: ASTM C143; one test for each set of compressive strength test specimens.
2. Entrained air: ASTM C231; one test for each set of compressive strength specimens.
3. Casting and curing concrete test specimens: ASTM C31; cast one set of four 6" x 12" standard test cylinders for each 100 cubic yards or fraction thereof, of concrete placed in any one day or for each 5,000 square feet of surface area placed.
4. Compression strength tests specimen: ASTM C39; per set of four standard cylinders, test one specimen at seven days, two specimens at 28 days, and one specimen held in reserve for later testing, if required.
5. When total quantity of a given class of concrete is less than 50 cubic yards, strength test may be waived by the Engineer if, in his judgment, adequate evidence of satisfactory strength is provided.

B. Test results will be reported in writing to the Engineer and Contractor on the same day that tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportion and materials, compressive breaking strength, type of break for both seven-day tests and 28-day tests, and air content.

C. Additional tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Engineer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed. Contractor shall pay for such tests conducted, and any other additional testing as may be required when unacceptable concrete is verified.

3.8 REPAIRS

A. Remove and replace concrete that was not placed on subgrade conditions required by the Contract Documents, was exposed to moisture prior to the period allowed by the Contract Documents, or that was otherwise not compliant with the Contract Documents.

END OF SECTION

SECTION 32 17 00
PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Parking lot and drive striping

1.2 SUBMITTALS

A. Furnish Engineer with manufacturer's certification indicating the paint used meets the requirements specified herein.

PART 2 - PRODUCTS

2.1 PAINT

A. Lead-free low VOC acrylic copolymer traffic marking paint.
   1. Developed for use over concrete, asphalt, and brick on parking lot surfaces.
   2. Paint shall be 100% acrylic, conventional dry, acetone based paint.

B. Color shall be as follows:
   1. White for automobile parking stalls, crosswalks, directional arrows, same direction lane dividers, stop lines, disability parking insignias, disability access aisles and “No Parking” lettering.
   2. Yellow for marking crosshatched no parking areas, opposing traffic lane dividers, curbs and centerlines.

PART 3 - EXECUTION

3.1 APPLICATION

A. Review striping plan with Owner and obtain approval prior to painting.

B. Allow asphalt surface to cure before painting.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce uniform, straight edges.
   1. Apply in accordance with manufacturer's recommendations.
   2. Parking stall lines shall be 4" wide.

E. Protect the newly painted areas from traffic until the paint has thoroughly dried.

END OF SECTION