

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Selective Site Demolition:

1. Demolition of designated site improvements including paving, pavement base materials, and fences.
2. Protection of adjacent structures and site improvements.
3. Removal and legal disposal of materials.

1.02 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Schedule: Submit for approval selective demolition schedule, including schedule and methods for capping utilities to be abandoned and maintaining existing utility service.

1.03 QUALITY ASSURANCE

- A. Codes and Regulations: Comply with governing codes and regulations. Use experienced workers.

1.04 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section.

1.05 SEQUENCING

- A. Immediate areas of work will not be occupied during selective demolition. The public, including children, may occupy adjacent areas.
- B. No responsibility structures and site improvements to be demolished will be assumed by the Owner.
- C. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS - Not applicable to this Section.

PART 3 EXECUTION

3.01 SELECTIVE DEMOLITION

- A. Demolition Operations: Do not damage building elements and improvements indicated to remain.
- B. Utilities: Locate, identify, and protect existing utilities.
- C. Operations: Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly.
- D. Security: Provide adequate protection against accidental trespassing. Secure project after work hours.
- E. Restoration: Restore disturbed areas outside of the work to pre-construction condition.

3.2 SCHEDULE

- A. Items for Protection During Demolition and Construction:
  - 1. Existing parking lots on and off site
  - 2. Existing skateboard park and playground.
  - 3. Existing recreation office building.
  - 4. Existing tree.

END OF SECTION 02 41 19

SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.01 SPECIAL CONDITIONS

- A. The CONTRACTOR shall notify "Dig-Safe" in Massachusetts at 1-800-322-4844 and the Wellfleet Department of Public Works prior to any excavation. The "Dig-Safe" approval number shall be provided to the ENGINEER.

1.02 RELATED DOCUMENTS

- A. Drawings and Division 1 Specification Sections apply to work of this section.

1.03 DESCRIPTION OF WORK

- A. Furnish all labor, equipment, and materials to complete the work of this section, which includes but is not necessarily limited to the following:
  - 1. Earthwork for pavement and parking areas, and adjacent landscaped areas, including:
    - a. Excavation
    - b. Backfill
    - c. Grading and compaction
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Section 31 11 00 "Site Preparation"
  - 2. Section 31 12 00 "Asphalt Paving"
  - 3. Section 32 90 00 "Loaming and Seeding"
  - 4. Section 33 41 00 "Stormwater Drainage Systems"

1.04 DEFINITIONS

- A. Pavement Area: Tennis courts, accessible parking space and aisle, accessible walkways/paths, and adjacent areas to a distance 6" outside the limits of pavement.
- B. Borrow: Soil material obtained off-site.

- C. Subgrade: The uppermost surface of an excavation, or the top surface of a fill or backfill, immediately below subbase, base, drainage fill, or topsoil materials.
- D. Subbase Course: The layer placed between the subgrade and base course in a paving system.
- E. Base Course: The layer placed between the subgrade or subbase and surface pavement in a paving system.
- F. Drainage Fill: Course of washed granular material supporting slab-on-grade placed to cut off upward capillary flow of pore water.
- G. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the ENGINEER. Unauthorized excavation, as well as remedial work directed by the ENGINEER, shall be at the CONTRACTOR's expense.
- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

#### 1.05 SUBMITTALS

- A. Comply with the pertinent provisions of Section 01 33 00 "Submittal Procedures"
- B. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- C. Test Reports: Submit for approval test reports, list of materials and gradations proposed for use.
- D. Photographs of existing adjacent structures and site improvements.

#### 1.06 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.
- B. Comply with applicable requirements of NFPA 495--Explosive Materials Code.
- C. Testing and Inspection Service: OWNER will employ a qualified independent geotechnical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.

- D. Materials placed and compacted which do not conform to project specifications for the application shall be removed and replaced with suitable material as directed by the ENGINEER at no additional cost to the OWNER.

#### 1.07 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the OWNER or others except when permitted in writing by the ENGINEER and then only after acceptable temporary utility services have been provided.
1. Provide a minimum 72-hours' notice to the ENGINEER and receive written notice to proceed before interrupting any utility.

### PART 2 – PRODUCTS

#### 2.01 MATERIALS

- A. Granular fill below the base course under pavement shall meet the following gradation requirements:

SIEVE SIZE	PERCENT FINER BY WEIGHT
3 inch	100
No. 10	30-95
No. 40	10-70
No. 200	0-8

- B. Leaching Stone:

Crushed stone shall be double-washed, shall conform to Massachusetts DPW standard specifications, Section M2.01.0 and shall meet the following gradation requirements:

SIEVE SIZE	PERCENT FINER BY WEIGHT
2 inch	100
1½ inch	95-100
1 inch	35-70
¾ inch	0-10
No. 200	0-0.5

C. Processed Gravel Base Course:

1. Processed gravel shall conform to Massachusetts DPW standard specifications, Section M1.03.1 and shall meet the following gradation requirements:

SIEVE SIZE	PERCENT FINER BY WEIGHT
2 inch	100
1 1/2 inch	70-100
3/4 inch	50-85
No. 4	30-60
No. 200	0-10

D. Bedding Sand:

1. Bedding sand shall be used for utility pipe bedding and initial backfill.
2. Bedding sand shall be free of silt, clay, loam, friable or soluble materials, organic matter, and frozen material, and shall meet the following gradation requirements:

SIEVE SIZE	PERCENT FINER BY WEIGHT
3/8 inch	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	2-10

3. On site sand may be used if tested and found to conform to the specifications above.

E. Common Fill

1. Common fill may be used for utility trench backfill above the bedding sand layer and for fills under pavements and pavers below the base material.
2. Common fill shall be clean sands and gravels free of silt, clay, loam, friable or soluble materials, frozen materials, and stones larger than 6" in maximum dimension, and shall conform to the following gradation requirements:

- a. It shall be of such nature and character that it can be placed in embankments and compacted to the specified density in a reasonable length of time.
- b. It shall be free from highly plastic clays, from all materials subject to decay, decomposition, or dissolution and from cinders or other materials which will corrode piping or other metals.
- c. It shall have a maximum dry density of not less than 100 lbs. per cubic foot.
- d. Material from excavation on the site may be used as common fill if it meets the above requirements, can be compacted to the specified densities, and is approved by the ENGINEER.

### PART 3 - EXECUTION

#### 3.01 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

#### 3.02 DEWATERING

- A. Prevent surface water, precipitation and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding project site and surrounding area.
- B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

#### 3.03 CUTTING PAVEMENT

- A. Excavations made on pavement shall be made in a careful manner so as to cause the least amount of damage to the pavement. Bituminous concrete pavement shall be cut prior to trench excavation. Pavement and/or cement concrete will be cut 12 inches either side of the maximum allowable trench width. Any damage to the cut line due to the excavations, backfilling or removal of temporary pavement shall be recut to neat lines at no additional cost to the OWNER, prior to replacement of the specified finished pavement. The width of pavement removed shall be kept as narrow as practicable. Existing pavement and base course disturbed or damaged

beyond the pavement lines indicated shall be replaced by the CONTRACTOR to match existing pavement and base course, at no additional cost to the OWNER.

- B. CONTRACTOR shall remove and dispose of existing bituminous concrete pavement off site as necessary to perform work of this contract as indicated. Removal of pavement shall be done in a neat manner by saw cutting a neat edge.
- C. Excavated pavement shall not be mixed with other excavated material which is to be used as backfill, and shall be removed immediately from the site of the work.

### 3.04 EXCAVATION

- A. Explosives: Do not use explosives.
- B. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered.

### 3.05 STABILITY OF EXCAVATIONS

- A. Comply with all codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.

### 3.06 APPROVAL OF SUBGRADE

- A. Notify ENGINEER when excavations have reached required subgrade.
- B. When ENGINEER determines that unforeseen unsatisfactory soil is present, continue excavation and replace with systematically placed and compacted backfill or fill material as directed.
  - 1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the ENGINEER at no cost to the OWNER.
- D. Soil Subgrades:
  - 1. The area shall be stripped of topsoil/loess and excavated to the subgrade elevation. During excavation, unsuitable materials exposed at subgrade level, such as trash, peat, wood, logs, tree stumps, construction/building

debris, topsoil, or other materials that may compress, decay, or collapse shall be removed.

2. The entire area shall be proof-rolled using compaction equipment. During proof-rolling, locations that appear soft, exhibit excessive weaving, or are otherwise unstable, shall be excavated to firm material or a maximum depth of 18 in. These local excavations shall be refilled with systematically placed and compacted Engineered Fill.

- E. Compacted Fill Surfaces: Compacted Fill, or other fill materials, which become disturbed, contaminated with clay or otherwise unacceptable to the ENGINEER shall be removed and replaced with acceptable Fill at no additional cost to the OWNER.

### 3.07 STORAGE OF SOIL MATERIALS

- A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Provide erosion control measures around perimeter of stockpiles. Cover to prevent wind-blown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
2. Establish soil and material stockpiles on site only at locations acceptable to the OWNER.

### 3.08 BACKFILL

- A. Backfill excavations promptly, but not before completing the following:

1. Acceptance of construction below finish grade.
2. Surveying locations of underground utilities for record documents.
3. Testing, inspecting, and approval of underground utilities.
4. Removal of trash and debris from excavation.
5. Removal of temporary shoring and bracing, and sheeting.

### 3.09 FILL

- A. Preparation: Remove vegetation, topsoil, debris, wet, and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills.

1. Plow, scarify, strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.

- B. When subgrade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil, and recompact to required density.
- C. Place and compact fill material in layers to required elevations.

### 3.10 MOISTURE CONTROL

- A. Uniformly moisten, moisture condition, or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
  - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to specified density.
    - a. Stockpile or spread and dry removed wet satisfactory soil material.
- B. Wet Weather: If fill material placement, spreading, rolling, or compaction operations are interrupted by heavy rain or other unfavorable conditions, do not resume such operations until ascertaining that the moisture content and density of the previously-placed soil are as required by these specifications.

### 3.11 COMPACTION

- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated compaction equipment.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.
- C. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM D1557:
  - 1. Under Pavements and parking areas: compact the top 12 inches below excavated subgrade and each layer of backfill or fill material to 95 percent maximum dry density.
  - 2. Under lawn or unpaved areas, compact the top 6 inches below subgrade and each layer of backfill or fill material at 90 percent maximum dry density.

- D. Materials which are placed and compacted to less than the specified density shall be:
  - 1. Recompact as required to achieve specified density.
  - 2. Removed and replaced with properly placed and acceptably compacted material.
- E. Compaction by puddling is prohibited.

### 3.12 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
  - 1. Provide a smooth transition between existing adjacent grades and new grades.
  - 2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.
- B. Site Grading: Slope grades to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  - 1. Lawn or Unpaved Areas: Plus or minus 0.10 foot.
  - 2. Pavements: Plus or minus 0.05 foot.

### 3.13 SUBBASE AND BASE COURSES

- A. Under pavements and parking areas, place base course material on prepared subgrades.
  - 1. Compact base courses at optimum moisture content to required grades, lines, cross sections and thickness to not less than 95 percent of ASTM D 4254 relative density (the density specified in paragraph 3.11).
  - 2. Shape base to required crown elevations and cross-slope grades.
  - 3. When thickness of compacted base course is 6 inches or less, place materials in a single layer.
  - 4. When thickness of compacted base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

- B. Pavement Shoulders: Place shoulders along edges of base course to prevent lateral movement. Construct shoulders at least 12 inches wide of acceptable soil materials and compact simultaneously with each subbase and base layer.

### 3.14 FIELD QUALITY CONTROL

- A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.
- B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

### 3.15 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.
  - 1. Scarify or remove and replace material to depth directed by the ENGINEER; reshape and recompact at optimum moisture content to the required density.
- C. Settling: Where settling occurs within 1 year after project completion, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

### 3.16 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. All unsuitable material, and suitable material not required for the proper completion of the contract, shall become the property of the CONTRACTOR, and shall be removed and properly disposed of off-site at no additional cost to the OWNER.

- B. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, debris, and pavement, and legally dispose of it off the OWNER's property, at no cost to the OWNER.

END OF SECTION 31 00 00

SECTION 32 12 00

ASPHALT PAVING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and Division 1 Specification Sections apply to work of this section.

1.02 DESCRIPTION OF WORK

- A. Furnish all materials, equipment, and labor to provide:
  - 1. Asphalt-aggregate, central-plant, hot-mix, bituminous pavement.
  - 2. Bituminous berm.
- B. Related Sections:
  - 1. Section 31 00 00 “Earthwork”

1.03 ENVIRONMENTAL CONDITIONS

- A. Bituminous paving shall not be placed when the ambient temperature is below 40 degrees F, or when there is frost in the base, or any other time when weather conditions are unsuitable for the type of material being placed.

1.04 PROTECTION

- A. After final rolling, no vehicular traffic of any kind shall be permitted on paving until it has cooled and hardened, and in no case less than 6 hours.
- B. Any damaged pavement resulting from work under this contract shall be repaired by the CONTRACTOR at no additional expense to the OWNER.

1.05 SUBMITTALS

- A. Product Data: Submit manufacturer’s product data and installation instructions for each material and product used.
- B. Test Reports: Submit for approval test reports, list of materials, and gradations proposed for use.

1.06 QUALITY ASSURANCE

A. Construction Tolerances:

1. Base Course Thickness: Within 1/4 inch.
2. Surface Course Thickness: Within 1/4 inch.
3. Base Course Surface Smoothness: Within 1/4 inch.
4. Surface Course Surface Smoothness: Within 3/16 inch. No ponding acceptable.
5. Crowned surfaces: Within 1/4 inch from template.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Bituminous Concrete Pavement shall be Class I, Type I-1 bituminous concrete pavement conforming to the Massachusetts DPW Standard Specifications Sections M3.11.01 through M3.11.08.

B. Asphalt:

1. The asphalt material shall conform to the requirements of the applicable table in "Specifications for Asphalt Cements and Liquid Asphalts", Specification Series No. 2, The Asphalt Institute. Paving asphalt shall be steam-refined paving asphalt with penetration grades of 85-100 for roads, and 60-70 for parking areas. The amount of asphalt to be mixed with the mineral aggregate shall be between 3-6 percent by weight for binder course and between 6.5-8 percent by weight for surface/finish course. The exact amount of asphalt to be mixed with the mineral aggregate shall be such that a hard, unyielding paving will be the result.

C. Mineral Aggregate:

1. Coarse and fine mineral aggregate shall consist of broken stone, crushed gravel, natural material having sufficient roughness when combined within the specified limits for grading, or a mixture thereof. If gravel is used, not less than 15 percent nor more than 30 percent limestone screenings by weight shall be added to the gravel as a separate ingredient so as to meet the gradation limits. If crushed stone is used, not less than 15 percent nor more than 30 percent sand by weight shall be added to the crushed stone as a separate ingredient to meet the gradation limits. The material shall be tough, durable, and sound, and shall be free from organic matter and other deleterious substances, and shall conform to the following gradation:

a. BINDER COURSE

BINDER COURSE	PERCENT PASSING
1 inch	100
3/4 inch	80-100
1/2 inch	55-75
No. 4	28-50
No. 8	20-38
No. 30	8-22
No. 50	5-15
No. 200	0-5
Bitumen	4.5-5.5

b. SURFACE/FINISH COURSE

SURFACE/FINISH COURSE	PERCENT PASSING
5/8 inch	100
1/2 inch	95-100
3/8 inch	80-100
No. 4	50-76
No. 8	37-54
No. 16	26-40
No. 30	17-29
No 50	10-21
No. 100	5-16
No. 200	2-7
Bitumen	5.5-7.0

- D. Prime Coat: Cut-back asphalt, ASTM D 2027.
- E. Tack Coat: Emulsified asphalt, ASTM D 977.
- F. Herbicide Treatment: commercial chemical for weed control registered by Environmental Protection Agency and acceptable to authorities having jurisdiction.
- G. Marking Paint: Alkyd-resin type, lead and chromate free, ready-mixed AASHTO M 248, Type \*, white or yellow.

2.02 MIXING

- A. Bituminous pavement shall be mixed at a central mixing plant by either batch mixing or continuous mixing, at a temperature not exceeding 325 degrees F. The completed mixture, tested at any time or at any location, shall have a uniform distribution of asphalt

binder, as determined by the extraction test, as performed in accordance with ASTM test method D2172.82. The bitumen ratio (pounds of asphalt per 100 pounds of dry aggregate), computed from laboratory extraction analysis, shall not vary more than 5 percent above or 10 percent below the exact amount predetermined to obtain hard unyielding paving.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Immediately before applying binder course, the area to be surfaced shall be cleaned of all loose material. Binder course shall not be applied until base course preparation has been completed, and only so far in advance of placing the surfacing as may be permitted by the ENGINEER.
- B. Surface Preparation: In advance of placing asphalt concrete, and before placing adjacent to cold transverse construction joints, such joints shall be trimmed to a vertical face and to a neat line.
- C. Spreading: The surface shall be clean of all dirt, packed soil, or any other foreign material, and shall be dry when spreading the bituminous mixture. The mixture shall be spread in two courses and to the amount required to obtain the compacted thickness and cross section shown on the design drawings. The mixture shall be spread without disturbing the base course and struck off so that the surface is smooth and true to cross section, free from all irregularities, and of uniform density throughout. Care shall be used in handling the mixture to avoid segregation. Areas of segregated mixture shall be removed and replaced with suitable mixture.
- D. Initial Rolling: The initial rolling shall consist of one complete coverage of asphalt mixtures and shall be performed with 3 wheel rollers or 2 wheel tandem rollers. Such rollers shall weigh not less than 12 tons. Rolling shall commence at the lower edge and shall progress toward the highest portion. Under no circumstances shall the center be rolled first. Rolling shall be performed with the drive wheel of the tandem roller forward with respect to the direction of spreading operations, unless otherwise permitted.
- E. Intermediate Rolling: The initial rolling shall be followed by additional rolling consisting of three complete coverages with an oscillating type pneumatic-tired roller developing at least 80 psi contact pressure while the temperature of the mixture is at, or above, 150 degrees F.
- F. Final Rolling: The final rolling of the uppermost layer of asphalt concrete shall be performed with either 2 or 3 wheel tandem rollers weighing not less than 10 tons. Rollers shall be operated at a speed of not more than 3 miles per hour and in a manner that will avoid cracking, pushing, or displacing the mixture during the compacting period. Rolling shall be continued until further compaction is obtained. All compacted

mixtures shall have a density of not less than 95 percent of that obtained by a laboratory compaction of an identical mixture. The use of any equipment that leaves ridges, indentations, or other objectionable marks in the asphalt concrete shall be discontinued.

- G. Finish Surface: The complete surfacing shall be thoroughly compacted, smooth, and true to grade and cross section, and free from ruts, humps, depressions, or irregularities. When a straightedge 10 feet long is laid on the finished surface and parallel with the center line of the road, the surface shall not vary more than 3/16 of an inch from the lower edge of the straightedge. Any ridges, indentations or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated either by rolling or other means.
- H. Construct berms to dimensions indicated or, if not indicated, to standard shapes.
- I. Provide 4" lane and striping paint in uniform, straight lines.

### 3.02 SPECIAL INSTRUCTIONS

- A. In addition to the requirements of this specification, paving shall conform to all state and local regulations and specifications.

END OF SECTION 32 12 00

SECTION 32 18 23

TENNIS COURT SURFACING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and Division 1 Specification Sections apply to work of this section.

1.02 DESCRIPTION OF WORK

- A. Furnish all materials, equipment, and labor to provide:

- 1. Color coating surface system.
- 2. Court Lines.

- B. Related Sections:

- 1. Section 32 12 00 “Asphalt Paving”

1.03 ENVIRONMENTAL CONDITIONS

- A. No color coating work, including filler course and court lines, shall be performed when rain is imminent or the temperature is below 55 degrees.

1.04 PROTECTION

- A. Color coating system and court lines shall be allowed to cure for length of time specified by the system manufacturer before being walked on or used.

1.05 SUBMITTALS

- A. Product Data: Submit manufacturer’s product data and installation instructions for each material and product used.
- B. Test Reports: Submit for approval test reports, list of materials, and gradations proposed for use.

1.06 QUALITY ASSURANCE

- A. Construction Tolerances:

1. No standing water (birdbaths) deeper than 1/16 inch after drainage of the area has ceased.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Filler: Compatible with and approved by selected color coating system manufacturer.
- B. Color Coating System:
  1. Durable, sanded coating, suitable for use in near-shore environment.
  2. Surface Color: green for 78' courts, blue for 36' and 60' tennis courts and pickle ball courts
  3. Court lines: Latex or acrylic line paint recommended by the manufacturer of the color coating system. White lines for tennis courts and yellow lines for pickle ball courts.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Inspect and clean asphalt surface.
- B. Apply filler as needed to remove minor surface irregularities and fill voids in the asphalt surface. Allow to cure. Re-apply as required.
- C. Apply color coating surface system in strict accordance with manufacturer's requirements and recommendations. Allow to cure. Re-apply as required.
- D. Paint court lines in conformance with the drawings and USTA standards.

END OF SECTION 32 18 23

SECTION 32 18 23.1

NETS AND POSTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and Division 1 Specification Sections apply to work of this section.

1.02 DESCRIPTION OF WORK

- A. Furnish all materials, equipment, and labor to provide:
  - 1. Net posts and net post sleeves.
  - 2. Net cables and center straps.
  - 3. Nets.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Net posts with screw-type, worm-gear, or ratchet-type internal winding mechanism to tighten the net. Posts shall be stainless steel, with a minimum tensile strength of 2,000 lbs.
- B. Net post sleeves with caps. Sleeves shall be stainless steel.
- C. Net cables with a minimum breaking strength of 3,000 pounds.
- D. Nets, constructed of polyethylene, and complying with USTA requirements.
- E. Center straps constructed of nylon or polyester, 2" wide, white, with stainless steel swivel hook at the bottom.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install net post sleeves and footings, and center strap anchor.

- B. Install net posts, net cables, nets, and center straps. Tighten net cables to recommended tension and install and adjust center straps to secure net to specified height.

END OF SECTION 32 18 23.1

SECTION 32 31 13  
CHAIN LINK FENCE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and Division 1 Specification Sections apply to work of this section.

1.02 DESCRIPTION OF WORK

- A. Provide vinyl coated chain link fence system and gates as shown on the Drawings, as specified herein and as needed for a complete and proper installation.

1.03 REFERENCES

- A. ASTM A491: Standard Specification for Aluminum-Coated Steel Chain Link Fence Fabric.
- B. ASTM A824: Standard Specification for Metallic-Coated Steel Marcellled Tension Wire.
- C. ASTM F552: Standard Definitions of Terms Relating to Chain Link Fencing.
- D. ASTM F567: Standard Practice for Installation of Chain Link Fence.
- E. ASTM F626: Standard Specification for Fence Fittings.

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.05 SUBMITTALS

- A. Submit under provisions of Section 01 30 00

PART 2 – PRODUCTS

2.01 CHAIN LINK FABRIC

- A. Wire Size: 9 GA
- B. Mesh Size: 1¾”
- C. Height: 10 feet
- D. Coating: Polyolefin-coated

E. Color: Black

F. Top and bottom of fence fabric to be bent double knuckled selvage

## 2.02 POSTS

A. Line and Corner Posts: 4 inch OD, (ASTM F1043) 50,000 psi galvanized steel pipe, polyolefin-coated to match fence fabric.

## 2.03 TOP AND BOTTOM RAILS

A. Top and bottom rail shall be 1.66-in. OD galvanized pipe, polyolefin-coated to match fence fabric.

## 2.04 GATES AND HARDWARE

A. Gate frames shall be of welded construction using 2 inch OD galvanized pipe, coated to match fence fabric.

B. Fence fabric to be attached to all four sides of gate frame by means of hook bolts and tension rods.

C. Gate hinges and latches shall be galvanized steel, coated to match fence fabric.

D. All hardware shall be galvanized steel, polyolefin-coated to match fence fabric

## 2.05 WINDSCREENS

A. Windscreens shall be open-mesh polypropylene, vinyl-coated polyester, or polyethylene

B. Height: 6 feet

C. Color: dark green

## PART 3 – EXECUTION

### 3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.02 INSTALLATION

A. Space posts no more than 10 ft. apart

- B. Set posts in 3,000 psi concrete footings, 24 inch diameter for corner posts and 18 inch diameter for line posts. Bottom of concrete footings shall be 6 in. deeper than bottom of posts in order to seal post ends.
- C. Install posts, rails, gates, hardware, and fence fabric in accordance with the Chain Link Fence Manufacturers Institute recommendations.
- D. Install windscreens on southern side of tennis court batteries. Set bottom of windscreens 2 feet above court surface.

END OF SECTION 32 31 13

SECTION 32 90 00

LOAMING AND SEEDING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and Division 1 Specifications and Sections apply to work of this Section.

1.02 DESCRIPTION OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and place loam, finish grade, apply lime and fertilizer, hydraulically apply seed and mulch and maintain all seeded areas as shown on the Drawings and as specified herein, including all disturbed areas.

1.03 RELATED WORK

- A. Section 31 00 00 "Earthwork".

1.04 SUBMITTALS

- A. Comply with the pertinent provisions of Division 1 "Submittals".
- B. Submit complete shop drawings, materials and equipment furnished under this Section including seed mixtures and product label information.
- C. Samples of all materials shall be submitted for inspection and acceptance upon OWNER's request.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Use of existing topsoil:
  - 1. Topsoil stripped from on-site areas may be reused as loam in all disturbed areas as shown on the Drawings, as amended as specified.
  - 2. Topsoil obtained from on-site areas shall be fertile, natural soil, screened to be free from large stones, roots, sticks, clay, peat, weeds and sod and shall be processed to create loam. It shall not be excessively acid or alkaline nor contain toxic material harmful to plant growth.

3. Contractor shall be responsible for screening topsoil and adding amendments to create suitable loam as specified below at his own expense. If necessary, Contractor shall also provide additional loam and amendments, as required to cover all disturbed areas as specified. Contractor shall screen existing topsoil with a 1-in screen and incorporate amendments prior to reuse or blending to create loam as specified herein.

B. Loam

1. Loam type must be consistent throughout the project and shall be obtained from the same approved source, matching approved samples. If source is changed at any time during construction, Contractor shall obtain new mechanical and nutrient tests of existing and all new source samples and submit them to the Owner for review and approval prior to ordering new material or amending existing soils.
2. Analysis:
  - a. Loam to be utilized for all disturbed areas shall be a mixture of sand, silt and clay particles as to exhibit sandy clayey properties in and about equal proportions and be considered a LOAM under SCS soils triangle. Loam shall be reasonably free of stumps, roots, heavy or stiff clay, stones equal or larger than 1-in. any dimension, lumps, coarse sand, noxious weeds, sticks, brush or other litter. It shall contain no toxic materials. Add soil amendments as specified and required at no additional cost to the Owner.
  - b. After loam has been stockpiled and prior to placing and fine grading, loam shall be sieve tested for particle size, for nutrient fertilizer requirements, pH requirements, and organic content requirements. Loam shall contain not less than 5% or more than 8% organic matter, as determined by the loss on ignition of oven dried samples. Test samples shall be oven dried to a constant temperature of 100 deg., Centigrade. The loam shall be amended, prior to placing and final grading, by the addition of leaf mold, yard waste compost or peat moss. Use of organic or other soil amendments is acceptable based on soil test results as approved by Owner. All amendments must be thoroughly mixed and incorporated with existing soils being reused.
  - c. The pH value of loam being spread shall be between pH 6.0 and 6.5.
  - d. Fertilizer and lime shall be spread and incorporated as per soil test recommendations after the loam is spread but prior to fine grading as approved by Conservation Agent.

- C. Fertilizer shall be a complete commercial fertilizer, starter type fertilizer for all seeded areas and nutrient mix shall be based on soil test recommendations as approved by Conservation Agent and Architect. Fertilizer shall minimum 50 percent slow release and be delivered to the site in the original unopened containers each showing the

manufacturer's guaranteed analysis. Store fertilizer so that when used it shall be dry and free flowing.

- D. Lime shall be ground limestone containing not less than 85 percent calcium and magnesium carbonates.
- E. Grass seed shall be from the same or previous year's crop; each variety of seed shall have a percentage of germination not less than 90, a percentage of purity not less than 85 and shall have not more than 1 percent weed content. The mixtures shall consist of seed proportioned by weight as follows:

Seed Mix:

"Turf-type Tall Fescue" .....	70%
<i>(3 of the following varieties: Falcon IV, Stetson II, Padre, Mojave II, Compete, Catalyst, Caesar)</i>	
"Notable or Double-time Turf-type Perennial Ryegrass" .....	20%
"Shamrock Kentucky Bluegrass" .....	10%

- F. The seed shall be furnished and delivered premixed in the proportions specified above. A manufacturer's certificate of compliance to the specified mixes shall be submitted by the manufacturer for each seed type. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed and also the net weight and date of shipment. No seed may be sown until the certificates have been submitted.
- G. Mulch shall be a specially processed cellulose fiber containing no growth or germination-inhibiting factors. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a homogeneous slurry. When sprayed on the ground, the material shall allow absorption and percolation of moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content.

### PART 3 - EXECUTION

#### 3.01 APPLICATION

- A. Unless otherwise shown on the Drawings, loam shall be placed to a minimum depth of 6-in on all disturbed areas for seeding.
- B. For all areas to be seeded:
  - 1. Lime shall be applied at the rate of 50 lbs./1,000 sq. ft. or as recommended by soil test and approved by OWNER.
  - 2. Fertilizer (10-10-10) shall be applied at the rate of 1 lb./1,000 sq. ft. or as

recommended by soil test and approved by OWNER.

3. Lawn seed shall be applied at the rate of 8 lbs./1,000 sq. ft
4. Fiber mulch shall be applied at the rate of 40 lbs./1,000 sq. ft.

- C. The application of fertilizer and lime may be performed hydraulically in one operation with hydro-seeding and mulching. If lime is applied in this manner, clean all structures and paved areas of unwanted deposits.

### 3.02 INSTALLATION

- A. The subgrade of all areas to be loamed and seeded shall be raked and all rubbish, sticks, roots and stones larger than 1-in shall be removed. Subgrade surfaces shall be raked or otherwise loosened immediately prior to being covered with loam. Subgrade shall be inspected and approved by the Engineer before loam is placed.
- B. Loam shall be placed over approved areas to a depth sufficiently greater than required so that after natural settlement and light rolling, the complete work will conform to the lines, grades and elevations indicated. No loam shall be spread in water or while frozen or muddy.
- C. After loam has been spread, it shall be carefully prepared by scarifying or harrowing and hand raking. All large stiff clods, lumps, brush, roots, stumps, litter and other foreign material shall be removed from the loamed area and disposed of the areas shall also be free of smaller stones, in excessive quantities, as determined by the Owner. The whole surface shall then be rolled with a hand roller weighing not more than 100 lbs./ft. of width. During the rolling, all depressions caused by settlement of rolling shall be filled with additional loam and the surface shall be regraded and rolled until a smooth and even finished grade is created.
- D. Seeding, mulching and conditioning shall only be performed during those periods within the seasons which are normal for such work as determined by the weather and locally accepted practice, as approved by the Owner. Hydroseed only on a calm day.
- E. Seeded areas shall receive site preparation and be seeded according to the manufacturer's written instructions as approved by Owner.
- F. Schedules for seeding and fertilizing must be submitted to the Owner for approval prior to the work. Seeding must be done during normal seeding seasons between April 1 and June 1 or August 1 and October 31. Seeding outside these times will be at contractor's risk and may require additional conditions by Owner at no additional cost.
- G. If lime and fertilizer are to be spread mechanically rather than in one operation with the hydro-seeding, then:
  1. After the loam is placed and before it is raked to true lines and rolled,

- limestone shall be spread evenly over loam surface and thoroughly incorporated with loam by heavy raking to at least 1/2 the depth of loam.
2. Fertilizer shall be uniformly spread and immediately mixed with the upper 2-in of topsoil.
- H. Seeding shall be done within 48 hours following soil preparation. Seed shall be applied hydraulically at the rates and percentages indicated. The spraying equipment and mixture shall be so designed that when the mixture is sprayed over an area, the grass seed and mulch shall be equal in quantity to the specified rates. Prior to the start of work, the Owner shall be furnished with a certified statement for approval as to the number of pounds of materials to be used per 100 gallons of water. This statement shall also specify the number of square feet of seeding that can be covered with the quantity of solution in the Hydroseeder.
- I. In order to prevent unnecessary erosion of newly graded slopes and unnecessary siltation of drainageways, carry out seeding and mulching as soon as satisfactory completion of a unit or portion of the project. A unit of the work will be defined as not more than 10,000 sq. ft.
- J. When protection of newly graded areas is necessary at a time which is outside of the normal seeding season, protect those areas by whatever means necessary (such as straw applied with a tar tack) or by other measures as approved by the Owner.
- K. All disturbed areas not covered by mulch, pavement or structures shall be loamed and seeded as directed by Owner.

### 3.03 MAINTENANCE AND ACCEPTANCE

- A. Keep all seeded areas watered and in good condition, reseeding if and when necessary until a good, healthy, uniform growth is established over the entire area seeded and shall maintain these areas in an approved condition including a minimum of three mowings of the seeded areas until project acceptance. Seeded areas shall be maintained at a height of no taller than 3 inches during establishment maintenance period.
- B. Provide against washouts by an approved method. Any washout which occurs shall be regraded and reseeded at the Contractor's expense until a good turf surface is established.
- C. The Owner will inspect all work for project acceptance at the end of the 12 week grass maintenance period, upon the written request, received at least 10 days before the anticipated date of inspection. Maintenance period must be during active turf growing season between April 15 and October 30.

- D. A satisfactory stand will be defined as a section of grass of 10,000 sq. ft. or larger that has:
  - 1. No bare spots larger than 1 sq. ft.
  - 2. No more than 10 percent of total area with bare spots larger than 1 sq. ft.
  - 3. Not more than 15 percent of total area with bare spots larger than 6-in square.
  
- E. Furnish full and complete written instructions for maintenance of the seeded areas to the Owner at the time of project acceptance.
  
- F. The inspection by the Owner will determine whether maintenance shall continue in any area of manner.
  
- G. After all necessary corrective work and clean-up has been completed, and maintenance instructions have been received by the Owner, the Owner will certify in writing the acceptance of the seeded areas. Maintenance of seeded areas, or parts of seeded areas shall cease on receipt of Project Acceptance.

END OF SECTION 32 90 00

SECTION 33 41 00

STORMWATER DRAINAGE SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and Division 1 Specification Sections apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Furnish all labor, equipment, and materials necessary to complete the installation of the storm drainage systems as shown on the drawings and by requirements of this section.

1.03 QUALITY ASSURANCE

A. Installer's Qualifications: Firm with at least 5 years of successful installation experience on projects with storm drainage work similar to that required for project.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

C. Record Drawings: At project closeout, submit record drawings of installed storm drainage piping and products.

PART 2 - PRODUCTS

2.01 IDENTIFICATION

A. Underground-Type Plastic Line Marker: Manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide green tape with black printing reading "CAUTION DRAINAGE LINE BURIED BELOW".

1. Manufacturer: Subject to compliance with requirements, provide identification markers of one of the following, or equal:
  - a. Allen Systems Inc.
  - b. Emed Co., Inc.

c. Seton Name Plate Corp.

## 2.02 PIPES AND PIPE FITTINGS

A. High Density Corrugated Polyethylene Smooth Interior Pipe: ASTM D3350, AASHTO M294, AASHTO M252.

1. Fittings: HDPE, AASHTO M252 or AASHTO M294.
2. Coupling bands shall cover at least one full corrugation on each section of pipe. When gasketed coupling bands are required, the gasket shall be made of closed-cell synthetic expanded rubber meeting the requirements of ASTM D1056, Grade RE2. All gaskets shall be installed on the coupler by the pipe manufacturer prior to delivery to the job site all coupling bands shall meet or exceed the soil-tightness requirements of the AASHTO Standard Specifications for Highway Bridges, Section 23, paragraph 23.3.1.5.4 (e). Fittings shall conform to the requirements of AASHTO M294.

B. Schedule 40 PVC Pipe and Fittings: ASTM D2665, Solvent-welded fittings

## 2.03 DRAINAGE MANHOLES (DMHs)

A. General: Provide precast reinforced concrete drainage manholes as indicated.

1. Basin: Precast reinforced concrete, 48" inside diameter, with flat slab top, base riser section with integral floor.
2. Frame and Cover: Ductile-iron, 26" diameter cover, heavy-duty, indented top design, with lettering cast into top reading "DRAIN", as indicated on the drawings.
3. Pipe Connectors: Resilient, complying with ASTM C 923.
4. Risers: Precast concrete with mortared joints

## 2.04 LEACHING RECHARGE BASIN (LRB)

A. General: heavy-duty, arch-shaped, interconnecting plastic leaching basins. Height = 18.5 inches; Base Width = 33 inches

B. See drawings for layout

## PART 3 - EXECUTION

### 3.01 INSTALLATION OF IDENTIFICATION

A. General: During back-filling of storm drainage systems, install continuous underground-type plastic line marker, located directly over buried line at 24" above top of pipe.

### 3.02 INSTALLATION OF PIPE AND PIPE FITTINGS

- A. General: Install pipes in accordance with governing authorities having jurisdiction, except where more stringent requirements are indicated.
1. Inspect pipe before installation to detect apparent defects. Mark defective materials with white paint and promptly remove from site.
  2. Lay pipe beginning at low point of system, true to grades and alignment indicated, with unbroken continuity of invert.
  3. Place bell ends or groove ends of pipe facing upstream.
  4. Install gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements.
  5. Install pipe in accordance with manufacturer's installation recommendations unless otherwise directed by the ENGINEER.
  6. Cleaning Pipe: Clear interior of piping of dirt and other superfluous material as work progresses. Maintain swab or drag in line and pull past each joint as it is completed.
    - a. In large, accessible pipe, brushes and brooms may be used for cleaning.
    - b. Place plugs in ends of uncompleted conduit at end of day or whenever work stops.
    - c. Flush lines between manholes if required to remove collected debris.
  7. Joint Adapters: Make joints between different types of pipe with standard manufactured adapters and fittings intended for that purpose.
  8. Closing Abandoned Utilities: Close open ends of abandoned underground utilities which are indicated to remain in place. Provide sufficiently strong closures to withstand hydro-static or earth pressure which may result after ends of abandoned utilities have been closed.
    - a. Close open ends of concrete or masonry utilities with not less than 8" thick brick masonry bulkheads.
  9. Interior Inspection: Inspect pipe to determine whether line displacement or other damage has occurred.
    - a. Make inspections after lines between structures have been installed and approximately 2' of backfill is in place, and again at completion of project.
    - b. If inspection indicates poor alignment, debris, displaced pipe, infiltration or other defects, correct such defects, and reinspect.

### 3.03 PRECAST CONCRETE DRAIN MANHOLES

- A. General: Place precast concrete sections as indicated. Set tops of frames and covers flush with finish surface
- B. Install in accordance with ASTM C 891.
- C. Provide rubber joint gasket complying with ASTM C 443 at joints of sections.
- D. Apply bituminous mastic coating at joints of sections.

3.04 LEACHING RECHARGE BASINS

- A. Excavate to required depth
- B. Install crushed stone base
- C. Set plastic recharge basin units
- D. Place crushed stone around and between recharge basin units
- E. Connect inlet pipes

3.05 BACKFILLING

- A. General: Conduct backfill operations of open-cut trenches closely following laying, jointing, and bedding of pipe, and after initial inspection and testing are completed.

3.06 TESTING AND INSPECTION

- A. Provide personnel and equipment necessary, and perform tests required to demonstrate that the work of this Section has been completed in accordance with the specified requirements.

END OF SECTION 33 41 00