

**SECTION 11 66 23.33
TENNIS EQUIPMENT**

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Provide all equipment and materials and do all work necessary to furnish and install the athletic equipment, as indicated on the drawings and as specified herein. Athletic equipment shall include, but not be limited to:
 - 1. Tennis net posts w/steel plated gears.
 - 2. Center hold down anchor.
 - 3. Tennis net cable and connectors.

1.02 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
 - 1. American Sports Builders Association (ASBA).
 - 2. United States Tennis Association (USTA).

1.03 SUBMITTALS

- A. Manufacturers Product Data
 - 1. Provide manufacturers product data prior to actual field installation work, for Engineers or Owners representatives' review.
- B. Shop Drawings
 - 1. Provide catalog cuts and drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work, for Engineers or Owners representatives' review.

1.04 RELATED SECTIONS

- A. Section 32 12 16 - Asphalt Pavement
- B. Section 32 13 13 - Concrete Pavement
- C. Section 32 18 23 - Tennis Court Surfacing System
- D. Section 32 31 00 - Fences and Gates
- E. Section 33 46 16 - Sub-Drainage Piping

1.05 QUALITY ASSURANCE

- A. Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to industry standards and inspection requirements.

1.06 PRODUCT DELIVERY AND STORAGE

- A. Materials delivered to the site shall be examined for damage or defects in shipping. Any defects shall be noted and reported to the Owners representative. Replacements, if necessary, shall be immediately re-ordered, so as to minimize any conflict with the construction schedule. Sound materials shall be stored above ground under protective cover or indoors so as to provide proper protection.

PART 2 - PRODUCTS

2.01 TENNIS EQUIPMENT

- A. Net posts shall have the following features.
 - 1. 3" OD Round 7 Gauge Galvanized Steel main post
 - 2. Verify net posts match existing tennis post sleeves.

3. Gear winding mechanism with all internal self-locking gears with a 30:1 ratio
 4. Welded lacing rods.
 5. Cast aluminum-alloy post caps and gear housings.
 6. Polyester powder coat finish, black.
 7. Aluminum ground sleeves.
 8. Include center anchor.
 9. Douglas DTP-37 Tennis Posts .
- B. Tennis nets shall be provided by owner.
- C. Pre-approved manufacturers include tennis posts, windscreen, and tennis nets as manufactured by:

Douglas Industries, Inc.

3441 S. 11th Ave.

Eldridge, IA 52748

Phone: 800-553-8907

Fax: 800-443-8907

www.douglas-sports.com

PART 3 EXECUTION

3.01 INSTALLATION OF EQUIPMENT

- A. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings.

END OF SECTION

**SECTION 31 10 00
SITE CLEARING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Removal of the North and West existing fencing, posts, post foundations, poles, gates, net posts and hold downs. All to become the contractor's property for recycle/reuse excepting items noted otherwise.
- B. Removal of net posts and net hold downs.
- C. Removal of topsoil, subsoil, existing base as needed, rough grading, and site contouring for the new sidewalk.

1.02 RELATED SECTIONS

- A. Section 31 22 00 Earthwork - Grading
- B. Section 31 23 00 Earthwork - Excavation and Fill
- C. Section 31 25 00 Earthwork - Erosion and Sediment Control

1.03 REGULATORY REQUIREMENTS

- A. Conform to applicable local and state code for disposal of debris.
- B. Coordinate clearing work with utility companies.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 PREPARATION

- A. Identify and protect utilities to remain from damage.
- B. Identify, tag, and protect trees, plant growth, and features designated to remain, as final landscaping.
- C. Verify that survey benchmark and intended elevations for the Work are as indicated.

3.02 CLEARING

- A. Clear areas required for access to site and execution of work to a minimum depth of 6 inches or as indicated on the drawings.
- B. Areas of pavement removal shall be sawcut to full depth of pavement prior to removal. Protect edge of pavements to remain.
- C. Remove trees and shrubs indicated. Remove stumps, main root ball and root system to a depth of 24 inches. Dispose of trees offsite per local ordinances.

3.03 CLEAN UP

- A. Dispose of all debris from site according to all State and Federal solid waste disposal laws and regulations and solid waste determinations of the EPA at the Contractor's expense.
- B. Remove demolished materials from site as work progresses.

END OF SECTION

**SECTION 31 22 00
GRADING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Compliance with erosion control requirements.
- B. Grading for aggregate bases and subgrades.
- C. Rough grading the site for ground water and storm water management, electrical utilities, and pavement.
- D. Finish grading.

1.02 RELATED SECTIONS

- A. Section 31 23 00 – Excavation & Fill.
- B. Section 31 25 00 – Erosion and Sediment Control
- C. Section 32 12 16 – Asphalt Pavement
- D. Section 32 13 13 – Concrete Pavement
- E. Section 33 46 16 – Sub-Drainage Piping

1.03 REFERENCES

- A. Illinois Department of Transportation (IDOT): Standard Specifications for Road and Bridge Construction, Adopted January 1, 2012

1.04 PROJECT CONDITIONS

- A. Contractor shall provide private utility locates of existing utilities prior to beginning earthwork operations.
- B. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs to remain from grading equipment and vehicular traffic.
- C. Protect above- and below-grade utilities that remain.
- D. Promptly repair damage to adjacent facilities caused by earthwork operations. Cost of repairs at Contractor's expense.
- E. Promptly notify Owner of unexpected sub-surface conditions.

1.05 QUALITY ASSURANCE

- A. Installer's qualifications: General Contractor shall demonstrate at least 3 years of successful installation experience on projects with work similar to that required for this project or be preapproved by the Rockford Public School District.
- B. Record drawings: At project close-out, submit record drawings of installed work. Especially note located utilities, areas of over-excavation, removal of unsuitable soils, and backfill.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that survey benchmark and intended elevations for the work are as indicated.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect utilities that remain, from damage.

- D. Notify utility company to remove and relocate utilities as necessary.
- E. Protect plant life, lawns, and other features remaining as a portion of the finish landscaping.
- F. Provide separate stockpiles for different soils material types as required.
- G. Protect benchmarks, and survey control point.

3.03 ROUGH GRADING

- A. Remove topsoil from areas to be further excavated or areas to receive structures, or pavement.
- B. Identify required lines, levels, contours, and datum.
- C. Cut and fill to transform site to indicated elevations and contours. Elevations listed on the plans are to top of pavement or top of finished grade for landscape areas. Establish rough grades at proper elevations to receive indicated thicknesses of topsoil, base fill material, slabs, surfacing and other finished materials.
- D. Smooth and level the surface of the existing soil and compact using heavy vibratory equipment until there is no loss of elevation.
- E. When excavating through roots, perform work by hand and cut roots with sharp axe.
- F. Prepare subgrade in accordance with Illinois Department of Transportation (IDOT): Standard Specifications for Highway and Bridge Construction, 2012, unless exceeded herein.
- G. Stability: Site is unstable and requires aggregate and geotechnical fabric to provide a working base. Refer to typical sections and soil report. Replace damaged or displaced subsoil to same requirements as for specified fill.
- H. Slope grades so as to provide positive drainage. Remove large stones, boulders and debris from the site. Rough grading shall be finished by blading to reasonably smooth contours with uniform transitions and slopes.

3.04 FINISH GRADING

- A. Before Finish Grading:
 - 1. Verify trench backfilling have been inspected.
 - 2. Verify subgrade has been contoured and compacted.
- B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size.

3.05 CLEANING AND PROTECTION

- A. Remove unused stockpiled topsoil. Grade stockpile area to prevent standing water.
- B. Remove all excess materials and debris from site to proper disposal location according to all state and local ordinances.
- C. Leave site clean and raked, ready to receive landscaping.

END OF SECTION

**SECTION 31 23 00
EXCAVATION AND BACKFILL**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Rough grading and filling the site for future base course and paving.
- B. Material for excavation and backfill of trenches for utilities.
- C. Final grading and shaping of site.

1.02 RELATED SECTIONS

- A. Section 31 25 00 – Erosion and Sediment Control
- B. Section 32 12 16 – Asphalt Pavement
- C. Section 32 31 00 – Fences and Gates
- D. Section 32 13 13 – Concrete Pavement
- E. Section 33 46 16 – Sub-Drainage Piping

1.03 REFERENCES

- A. Illinois Department of Transportation (IDOT): Standard Specifications for Road and Bridge Construction, Adopted January 1, 2012.
- B. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- C. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2000.
- D. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2000a.
- E. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 1994 (2001).
- F. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2000.
- G. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2001.
- H. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2001.
- I. ASTM D4253 - Standard test Method for Maximum Index Density and Unit Weight of Soils Using a vibratory Table.
- J. ASTM D4254 - Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

1.04 PROJECT CONDITIONS

- A. Contractor is to provide construction layout stakes for all necessary grading, lines, and control points for the work.
- B. Contractor to provide private utility location markings and protect above and below grade utilities that remain.
- C. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs to remain from grading equipment and vehicular traffic.
- D. Protect materials from tracking off site.

1.05 SUBMITTALS

- A. Submit catalog cut sheets for intended products,
- B. Submit sources for aggregates including gradations.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General Fill: Suitable Subsoil from on site, off-site borrow, or Contractor Furnished borrow.
 - 1. Free of organic soil lumps larger than 3 inches, rocks larger than 2 inches, and debris.
 - 2. Off Site Borrow: Conforming to ASTM D 2487 Group Symbol GC, GW, GM, SC, SM, SW, and SP or a combination of these groups. Soils classified with ASTM D 2487 Group Symbol CL, CL-ML, OR ML may also be used. When using soil classified as CL the liquid limit and plasticity index shall be less than 45 and 20 respectively.
 - 3. Soil conforming to ASTM D 2487 Group Symbol OL, OH, MH, CH, or PT shall not be used under paving, structures, or as backfill around foundations.
- B. Stabilization Backfill Material – Illinois CA-1 or approved equal conforming to Illinois Department of Transportation (IDOT): Standard Specifications for Road and Bridge Construction, Adopted January 1, 2012. Recycled concrete is acceptable providing it meets the gradation and quality requirements of this section.
- C. Granular base and sub-base: Illinois CA-6 (non-free draining) or approved equal conforming to Illinois Department of Transportation (IDOT): Standard Specifications for Road and Bridge Construction, Adopted January 1, 2012. Recycled concrete is acceptable providing it meets the gradation and quality requirements of this section.
- D. Topsoil - Per Illinois DOT Standard Specifications. Topsoil furnished by the Contractor shall consist of a natural friable surface soil without admixtures of undesirable subsoil, refuse, or foreign materials. It shall be shredded and free from roots, hard clay, rocks larger than one inch (1") in any dimension, noxious weeds, tall grass, brush, sticks, stubble, or other litter, and shall have indicated by a healthy growth of crops, grasses, trees, or other vegetation that it is free-draining and non-toxic. Topsoil shall contain not more than ten percent (10%) gravel by dry weight of total sample. For the purposes of this specification gravel is defined per ASTM D422 modified to include only material passing one inch (1") and retained on the No. 4 sieve.
- E. Geotechnical Fabric for Ground Stabilization: Material shall be a woven Polypropylene fabric with an ASTM D4632 grab strength not less than 200 psi, ASTM D 4355 500 hour UV resistance not less than 70%, ASTM D4731 AOS of 30. Approved fabric: Mirafi 500X, or equal.
- F. Geotechnical Filter Fabric: Material shall be a geotextile composed of high-tenacity monofilament polypropylene yarns (or equal) and exhibit the following properties.

<u>Mechanical Properties</u>	<u>Test Method</u>	<u>Unit</u>	<u>Minimum Average</u>	
			<u>Roll Value</u>	<u>MD - CD</u>
Wide Width Tensile Strength	ASTM D4595	lbs./in (kN/m)	200 (35.0)	140 - (24.5)
Grab Tensile Strength	ASTM D4632	lbs. (N)	365 (1624)	200 - (890)
Grab Tensile Elongation	ASTM D4632	%	24	10
Trapezoid Tear Strength	ASTM D4533	lbs./in (N)	115 (512)	75 - (334)
CBR Puncture Strength	ASTM D6241	lbs./in (N)		675 - (3004)
Apparent Opening Size (AOS) ¹	ASTM D4751	U.S. Sieve		40
Percent Open Area	COE-02215	(mm)		(0.43)
Permittivity	ASTM D4491	%		10
Permeability	ASTM D4491	sec-1		2.1
Flow Rate	ASTM D4491	cm/sec		0.14
		gal/min/ft ²		145
		(l/min/m ²)		(5907)

<u>Mechanical Properties</u>	<u>Test Method</u>	<u>Unit</u>	<u>Minimum Average</u> <u>Roll Value</u>
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	MD - CD 90
<u>Physical Properties</u>		<u>Unit</u>	<u>Typical Value</u>
Mass/Unit Area (ASTM D5261)		oz./yd ² (g/m ²)	5.6 (207)
Thickness (ASTM D5199)		mils (mm)	24 (0.7)
Roll Dimensions (width x length)		ft. (m)	12.5 x 300 (3.8 x 91)
Roll Area		yd ² (m ²)	417 (348)
Estimated Roll Weight		lbs. (Kg)	169 (77)

Suggested products include Mirafi FW402, US Fabrics US 1540, Propex/Geotex 111F, and WinFab 2197. Geotechnical filter fabric shall be placed in accordance with the manufacturers specifications including preparation, edge lap and handling procedures.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that survey benchmarks and intended elevations for the work are as indicated.
- B. Fill areas in the order shown on the drawings. Other fill sources: Excavations from on-site provided they meet the requirements of 2.01 Materials above.
- C. Topsoil – Salvage from on-site sources unless off site sources are approved.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect utilities that remain, from damage.
- D. Notify utility company to remove and relocate utilities as necessary.
- E. Mark and verify removal items and limits.
- F. Protect plant life, lawns, and other features remaining as a portion of the finish landscaping.
- G. Provide separate stockpiles for different soil material types as required.
- H. Comply with the site erosion control plan and permit requirements.
- I. Clean and maintain a tire cleaning area at the entrance to the site during operations.
- J. Protect benchmarks, survey control points, fences, paving, and curbs to remain from excavating equipment and vehicular traffic. Prevent fill materials from tracking off site.

3.03 ROUGH GRADING

- A. Identify required lines, levels, contours, and datum. Remove any debris, vegetation, or organic material.
- B. Before placing aggregate stabilization fill, smooth and level the surface of the existing soil and compact as reasonable. Do not over compact.
- C. Do not remove wet subsoil unless it is subsequently processed to obtain optimum moisture content.
- D. Install geotechnical fabric for ground stabilization and stabilizing aggregate per cross section.
- E. Provide allowance for 6" of topsoil in non-paved areas. Topsoil must be left smooth, uniform, without debris, lumps, or rocks larger than 1" and ready to be fertilized and seeded.
- F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

- G. Remove large stones, boulders and debris from the site. Rough grading shall be finished by blading to reasonably smooth contours with uniform transitions and slopes.
- H. Place and maintain silt fence and other erosion control items to prevent silt from entering adjacent properties or ROW. Comply with erosion control requirements and permit.

3.04 SOIL REMOVAL

- A. In areas to receive new construction and where grades are changed, remove all organic soils (topsoil) and fill materials placed without adequate compaction. Store materials for reuse.
- B. Stockpiles: Use areas designated on site or as agreed to; pile depth not to exceed 8 feet; protect from erosion. Grade stockpile area to prevent standing water.

3.05 FINAL GRADING

- A. Before Final Grading:
 - 1. Verify subgrade backfilling has been inspected.
 - 2. Verify subgrade has been contoured and compacted.
 - 3. Verify utility excavation is complete, utilities are installed, tested, and are ready for use.
- B. Remove any subgrade debris, roots, branches, stones, in excess of 3 inch in size.
- C. Verify landscape locations and depths to receive topsoil.

3.06 TOLERANCES

- A. Top Surface of Subgrade areas: Plus or minus 0.08 foot from required elevation.
- B. Grading around pavements, between curbs, adjacent to sidewalks as final surfaces, slope to drain and plus or minus .05 foot.

3.07 TESTING

- A. Verify soil materials comply with Section 2.1 above.
- B. Spread soils in loose lifts not to exceed 6" in depth. Disk or dry soils to optimum moisture plus or minus 2% prior to applying compactive effort. Roll as required to obtain density. Adjust moisture content by adding water or diking as needed to reach moisture required. No additional pay allowance will be made for moisture adjustment.
- C. Shape fills such that water does not pond.
- D. Additional lifts may not be made unless the density requirements are met on the in-place lift.
- E. Density testing will be performed once areas have been cleared and ready to receive fills or specified surfaces, including sidewalks. Initially testing will be required until the required densities are achieved and a workable process is in place over a fill area.

3.08 CLEANING AND PROTECTION

- A. Leave site clean uniform, ready to receive future work or temporary seeding. Clean mud from the tire cleaning area and the access way periodically during the work.
- B. Rake and clean entire disturbed areas for seeding.

PART 4 - TESTING SCHEDULE

4.01 EARTHWORK

- A. Owner furnished testing at subgrade areas, and prior to final court subgrade acceptance if instability is exhibited.

END OF SECTION

**SECTION 31 25 00
EROSION AND SEDIMENT CONTROL**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation of soils, collection and management of surface water and erosion.
- B. Implementation of Construction Storm Water Pollution Prevention Plan (SWPPP) in compliance with site permitting.
- C. Permanent Fertilizer, Seeding and Mulching.

1.02 RELATED SECTIONS

- A. Section 31 10 00 – Site Clearing
- B. Section 31 22 00 – Grading
- C. Section 31 23 00 – Excavation and Fill
- D. Section 32 12 16 – Asphalt Pavement
- E. Section 32 13 13 – Concrete Pavement
- F. Section 33 46 16 – Sub-Drainage Piping

1.03 REFERENCES

- A. Illinois Department of Transportation (IDOT): Standard Specifications for Highway and Bridge Construction, Series 2012.
- B. Illinois Procedures and Standards for Urban Soil Erosion and Sedimentation Control.
- C. City of Rockford regulations.
- D. Storm Water Pollution Prevention Plan and Erosion Control Plan.
- E. Erosion Control Testing Council (ECTC).

PART 2 PRODUCTS

2.01 MATERIALS

- A. Erosion Control Materials, Illinois Department of Transportation (IDOT): Standard Specifications for Road and Bridge Construction, Adopted January 1, 2012.
- B. Temporary Erosion Control Seeding: Table 4169.02-02, 65% Rye, 35% Oats.
- C. Permanent Seeding: Per City of Rockford Standards and Specifications.
- D. Silt Filter Fence: Section 4196.01,B. and I.M. 496.01.
- E. Netless Erosion Control Blanket: Futerra F4 Netless or Equivalent having the following characteristics:
 - 1. Mass per Unit Area: 5 oz/yd²
 - 2. Thickness: 0.2 in.
 - 3. Tensile Strength: 4.3 lb/ft
 - 4. % Ground Cover: 79%
 - 5. Flexural Rigidity: 0.006 oz-in
 - 6. Water Absorption: 395%
 - 7. Shear Stress: 1 lb/ft²
 - 8. Functional Longevity: ≤ 12 months

PART 3 EXECUTION

3.01 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

- A. Erosion Control Plan Sheets: A general approach is included in the project plan sheets and SWPPP binder. A narrative is included on the plan sheets to provide a description for the work. This description is furnished to establish a level of effort needed to achieve permit compliance. It is understood and expected that actual conditions during construction will require ongoing adjustments to the Erosion Control Plan (ECP) and ultimately the Storm Water Pollution Prevention Plan (SWPPP) for this project.
- B. Responsibility: The City of Rockford, is the jurisdictional control for this project. All persons performing surface disturbing activities on the site to take responsibility for their actions by conforming with the plan as permitted, or by adjusting the plan to accommodate schedule and method changes. Persons performing work on site are required to log in to the plan and log out when they have completed their activities. Changes to the plan are permitted, and various controls are shown in the ECP to allow flexibility of the plan without violating the permit.
- C. Plan Modifications: Changes to the ECP must be in compliance with the conditions of the prevailing permit. These changes, along with periodic inspection reports mandated by time and rainfall events during construction are subject to inspection by the City of Rockford and the IEPA / EPA. Failure to keep the appropriate records and failure to comply with the permit are reasons for enforcement action involving all parties.

3.02 INSTALLATION

- A. Per Manufacturer's Instructions.

3.03 SCHEDULE

- A. Refer to the Erosion Control drawings for project details and schedule for seeding, silt filter fence locations, and temporary drainage provisions.
- B. Refer to plans for details on for utilities.
- C. All materials are to be installed in accordance with the manufacturer's guidelines.
- D. Temporary Seeding: 100 lbs per acre application and reseeded at 7-day intervals on bare areas regardless of weather conditions.

3.04 SUBMITTALS

- A. All seed material is to be certified as meeting the above criteria prior to incorporation in the project.
- B. Erosion Control items require product certification for their intended use.

END OF SECTION

**SECTION 32 13 13
CONCRETE PAVEMENT**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-structural concrete flatwork and/or sidewalks
- B. Compacted granular base.
- C. Backfilling form lines with appropriate material.
- D. Miscellaneous Concrete, fence and foundations.

1.02 RELATED SECTIONS

- A. Section 11 68 23.33 – Tennis Equipment
- B. Section 31 23 00 – Excavation and Fill
- C. Section 31 25 00 – Erosion and Sediment Control
- D. Section 32 12 16 – Asphalt Pavement
- E. Section 32 31 00 – Fences and Gates
- F. Section 33 46 16 – Sub-Drainage Piping

1.03 REFERENCES

- A. Illinois Department of Transportation (IDOT): Standard Specification for Highway and Bridge Construction, Series 2012.

1.04 PROJECT CONDITION

- A. Verify that subgrade elevations meet tolerances in Section 31 23 00 – Excavation and Fill.
- B. Provide sufficient paving operations to meet project schedule and requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. All products must meet or exceed the requirements of the Illinois Department of Transportation (IDOT): Standard Specifications for Highway and Bridge Construction, Series 2012.
- B. Portland Cement Concrete Pavements and Sidewalks as per the Illinois Department of Transportation (IDOT): Standard Specifications for Highway and Bridge Construction, Series 2012.
- C. Miscellaneous Concrete shall conform to the Illinois Department of Transportation (IDOT); Standard Specifications for Highway and Bridge construction, Series 2012.
- D. Aggregate Base: Illinois CA-6 as per Section 1004 (quality) of the Illinois Department of Transportation (IDOT) Standard Specifications for Highway and Bridge construction, Series 2012. Recycled concrete is acceptable providing it meets gradation and quality requirements. Use per drawings.
- E. Drainable Base or free draining Aggregate: Drainable base shall be clean crushed limestone to be free draining and having an air void content by volume $\geq 35\%$. Acceptable aggregate: Illinois CA-7. Use per drawings.
- F. Provide from an Illinois DOT certified source, P.C. concrete meeting all of the following characteristics:
 - Compressive Strength at 28 days: 4,000 psi.
 - Slump: 4 inches maximum.
 - Air Entrainment: 5 - 8 percent.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify gradients and elevations of base.
- B. Verify compacted sub-grade is dry and ready to support paving and imposed loads.
- C. Verify that all utilities within the work area have been installed, tested, and are ready to be paved over.

3.02 PREPARATION

- A. Scarify sub-grade surface to a depth of 6 inches in all areas compacted by construction activities prior to placing fill.
- B. Cut out soft areas of sub-grade not capable of compaction in place. Backfill with general fill.
- C. Compact sub-grade to density equal to or greater than the requirements for subsequent fill material.
- D. Moisten substrate to minimize absorption of water from fresh concrete.

3.03 BASE CONSTRUCTION

- A. Fill areas to contours and elevations using unfrozen materials.
- B. Place aggregate fill materials in continuous layers not exceeding 8" on top of geotechnical fabric (if specified).
- C. Compact aggregates in 8" deep lifts maximum, within 0 to +4% above optimum moisture content, and compact each lift by approved methods to not less than 95% of the maximum density given by ASTM D698 (Standard Proctor Density). Keep compacted lifts relatively smooth and level.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.

3.04 FORMING

- A. Place and secure forms to correct location, dimension, and profile.
- B. Place joint filler in joints, vertical in position, in straight lines. Secure to formwork.
- C. Place joint filler between paving components and other appurtenances.

3.05 PLACING CONCRETE

- A. Mixing and handling of fresh concrete, including transit time, shall be as per Section 420 of the Illinois Department of Transportation (IDOT): Standard Specifications for Highway and Bridge Construction, Series 2012.
- B. Place Portland Cement Concrete in accordance with Section 420 of the Illinois Department of Transportation (IDOT): Standard Specifications for Highway and Bridge Construction, Series 2012.
- C. Special scoring, architectural joint treatment, color, or special surface treatments as specified.

3.06 FINISHING

- A. Paving shall be finished according to the Illinois Department of Transportation (IDOT): Standard Specifications for Highway and Bridge Construction, Series 2012.
- B. Sidewalks: Standard, Light broom, radiused and trowel joint edges. Joint pattern shall be uniform and not exceeding the sidewalk width unless specified elsewhere.
- C. Curbs and Gutters: Broom finish.

3.07 TOLERANCES

- A. Flatness: Maximum variation of one-quarter inch in ten feet as measured with a ten-foot straight edge.
- B. Compacted Scheduled Thickness (sub-grades): Within one-quarter inch of design thickness.
- C. Variation from True Elevation: One half inch.

3.08 JOINTS

- A. Sidewalk joint spacing will be 5' or equal to the width of the walk unless specified elsewhere.

END OF SECTION

SECTION 32 18 23
ASPHALT TENNIS COURT SURFACE COLOR COATING SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Asphalt tennis court surface color coating system.
- B. All courts are to receive both standard singles and doubles markings. All per USTA guidelines, Court color to be red with grey outer areas.

1.02 RELATED REQUIREMENTS

- A. Section 11 68 23.33 – Tennis Equipment
- B. Section 32 12 16 – Asphalt Pavement
- C. Section 32 31 00 – Fences and Gates

1.03 REFERENCE STANDARDS

- A. American Sports Builders Association (ASBA).
- B. United States Tennis Association (USTA) Rules of Tennis.
- C. International Tennis Federation (ITF).

1.04 SUBMITTALS

- A. Comply with Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including surface and crack preparation and application instructions.
- C. Samples: Submit manufacturer's color samples of color coating.
- D. Test Reports:
 - 1. Submit independent test results for solar reflectance index.
 - 2. Submit independent test results for 2000 Hour ASTM G154, accelerated weathering UV test, to demonstrate long-term durability and fade resistance.
 - 3. Submit independent test results for 2000 Hour, accelerated weathering ASTM G155 Xenon Arc test, to demonstrate long-term fade resistance and quality of pigment.
- E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- F. Manufacturer's Project References: Submit manufacturer's list of successfully completed asphalt tennis court surface color coating system projects, including project name, location, and date of application.
- G. Applicator's Project References: Submit applicator's list of successfully completed asphalt tennis court surface color coating system projects, including project name, location, type and quantity of color coating system applied, and date of application.
- H. Warranty Documentation: Submit manufacturer's standard warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer's Qualifications
 - 1. Manufacturer regularly engaged, for past 5 years, in manufacture of asphalt tennis court surface color coating systems of similar type to that specified.
 - 2. United States owned company.
 - 3. Member: ASBA.
 - 4. Manufacturer has surfaces that are classified by the ITF's (International Tennis Federation) pace classification program.

- B. Applicator's Qualifications:
 - 1. Applicator regularly engaged, for past 3 years, in application of tennis court surface color coating systems of similar type to that specified.
 - 2. Employ persons trained for application of tennis court surface color coating systems.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.
 - 2. Keep materials in manufacturer's original, unopened containers and packaging until application.
 - 3. Store materials in clean, dry area indoors.
 - 4. Store materials out of direct sunlight.
 - 5. Keep materials from freezing.
 - 6. Protect materials during storage, handling, and application to prevent contamination or damage.
 - 7. Close containers when not in use.

1.07 AMBIENT CONDITIONS

- A. Do not apply asphalt tennis court surface color coating system when air or surface temperatures are below 50 degrees F during application or within 24 hours after application.
- B. Do not apply asphalt tennis court surface color coating system when rain is expected during application or within 24 hours after application.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. SportMaster Sport Surfaces, PO Box 2277, 2520 South Campbell Street, Sandusky, Ohio 44870. Toll Free 800-326-1994. Fax 877-825-9226. Website www.sportmaster.net. E-mail info@sportmaster.net or equivalent.
- B. Plexipave and DecoColor approved equivalent products to the material specifications below.
- C. Laykold approved equivalent products to the materials specifications below.

2.02 MATERIALS

- A. Asphalt Tennis Court Surface Color Coating System: SportMaster Color Coating System or equivalent.
- B. Crack Sealant: SportMaster "Crack Magic" or equivalent.
 - 1. 100 percent acrylic emulsion elastomeric crack sealant.
 - 2. Seals cracks up to 1/2 inch wide in asphalt pavement.
 - 3. Weight per Gallon at 77 Degrees F: 8.8 lbs., plus or minus 0.5 lbs.
 - 4. Non-Volatile Material: 61 percent, plus or minus 5 percent.
 - 5. Color: Neutral.
- C. Crack Filler: SportMaster "Acrylic Crack Patch" or equivalent.
 - 1. 100 percent acrylic emulsion trowel-grade crack filler.
 - 2. Fills cracks in asphalt pavement up to 1 inch wide.

3. Chemical Characteristics, by Weight, Minimum:
 - a. Acrylic Emulsion: 10.0 percent.
 - b. Hiding Pigment: 0.2 percent.
 - c. Mineral Inert Fillers: 78.0 percent.
 - d. Film Formers, Additives: 1.8 percent.
 - e. Water: 8.5 percent.
 4. Weight per Gallon at 77 Degrees F: 15.2 lbs., plus or minus 1.0 lbs.
 5. Non-Volatile Material: 80 percent, plus or minus 5 percent.
 6. Color: Neutral.
- D. Patch Binder: SportMaster "Acrylic Patch Binder" or equivalent.
1. 100 percent acrylic emulsion liquid binder.
 2. Mix on-site with sand and cement.
 3. Levels and repairs low spots and depressions up to 3/4 inch deep in asphalt pavement.
 4. Fills Cracks in Asphalt up to 1" in width.
 5. Weight per Gallon at 77 Degrees F: 8.8 lbs., plus or minus 0.5 lbs.
- E. Filler Course: SportMaster "Acrylic Resurfacer" or equivalent.
1. 100 percent acrylic emulsion resurfacer.
 2. Mix on-site with silica sand.
 3. Apply to asphalt surfaces or previously colored acrylic surfaces in preparation of color coating system.
 4. Chemical Characteristics, by Weight, Minimum:
 - a. Acrylic Emulsion: 44.0 percent.
 - b. Hiding Pigment: 2.0 percent.
 - c. Mineral Inert Fillers: 5.0 percent.
 - d. Film Formers, Additives: 0.2 percent.
 - e. Water: 45.0 percent.
 5. Weight per Gallon at 77 Degrees F: 8.5 lbs., plus or minus 0.5 lbs.
 6. Non-Volatile Material: 27.5 percent, plus or minus 5.0 percent.
 7. Color: Neutral Color preferred.
- F. Color Coating: SportMaster "ColorPlus System" or equivalent.
1. 100 percent acrylic emulsion coating.
 2. Mix on-site with silica sand and water.
 3. Color coats tennis and multipurpose courts.
 4. Weight per Gallon at 77 Degrees F: 9.2 lbs., plus or minus 0.5 lbs.
- G. Line Markings Primer: SportMaster "Stripe-Rite" or equivalent.
1. 100 percent acrylic emulsion primer, clear drying.
 2. Primes line markings and prevents bleed-under for sharp lines.
 3. Chemical Characteristics, by Weight, Nominal:
 - a. Acrylic Emulsion: 38.0 percent.
 - b. Hiding Pigment: 0.0 percent.

- c. Mineral Inert Fillers: 7.0 percent.
 - d. Film Formers, Additives: 1.5 percent.
 - e. Water: 50.0 percent.
 - 4. Weight per Gallon at 77 Degrees F: 8.9 lbs., plus or minus 0.5 lbs.
 - 5. Non-Volatile Material: 29 percent, plus or minus 5 percent.
- H. Line Paint: SportMaster "Textured Line Paint" or equivalent.
 - 1. Pigmented, 100 percent acrylic emulsion line paint.
 - 2. Line marking on asphalt tennis courts.
 - 3. Chemical Characteristics, by Weight, Nominal:
 - a. Acrylic Emulsion: 25.89 percent.
 - b. Pigment: 14.90 percent.
 - c. Mineral Inert Fillers: 13.12 percent.
 - d. Additives: 4.73 percent.
 - e. Water: 41.36 percent.
 - 4. Weight per Gallon at 77 Degrees F: 10.65 lbs., plus or minus 0.75 lbs.
 - 5. Non-Volatile Material: 45.17 percent, plus or minus 5 percent.
 - 6. Color: White.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine asphalt tennis court surfaces to receive color coating system.
- B. Verify asphalt tennis courts meet ASBA requirements.
- C. Notify Engineer of conditions that would adversely affect application or subsequent use.
- D. Do not begin surface preparation or application until unacceptable conditions are corrected.

3.02 SURFACE PREPARATION

- A. Protection of In-Place Conditions: Protect adjacent surfaces and landscaping from contact with asphalt tennis court surface color coating system.
- B. Prepare surfaces in accordance with manufacturer's instructions.
- C. Cure new asphalt surfaces a minimum of 14 to 30 days before application of asphalt tennis court surface color coating system.
- D. Remove dirt, dust, debris, oil, grease, vegetation, loose materials, and other surface contaminants which could adversely affect application of asphalt tennis court surface color coating system. Pressure wash entire surface.
- E. Repair cracks, depressions, and surface defects in accordance with manufacturer's instructions before application of filler course and color coating.
- F. Level depressions 1/8 inch and deeper with patch binder in accordance with manufacturer's instructions.
- G. Apply 1 or 2 coats of filler course as required by surface roughness and porosity to provide smooth underlayment for application of color coating.
- H. Ensure surface repairs are flush and smooth to adjoining surfaces.

3.03 APPLICATION

- A. Apply asphalt tennis court surface color coating system in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Mix materials in accordance with manufacturer's instructions.
- C. Apply Filler Course and Color Coating with a 50-60 durometer, soft rubber squeegee.
- D. Filler Course:
 - 1. Apply 2 coats on new acrylic surfaces with extensive cracks or low spot repair.
 - 2. Apply 1 coat on existing acrylic surfaces with minimal repairs.
- E. Color Coating: Apply a minimum of 2 coats of color coating to prepared surfaces in accordance with manufacturer's instructions.
- F. Allow material drying times in accordance with manufacturer's instructions before applying other materials or opening completed surface to foot traffic.

3.04 LINE MARKINGS

- A. Lay out tennis court line markings in accordance with USTA Rules of Tennis.
- B. Apply line markings primer, after masking tape has been laid to seal voids between masking tape and tennis court surface to prevent bleed-under when line paint is applied.
- C. Apply a minimum of 1 coat of line paint in accordance with manufacturer's instructions.

3.05 PROTECTION

- A. Allow a minimum of 24 hours curing time before opening tennis courts for play.
- B. Protect applied asphalt tennis court surface color coating system to ensure that, except for normal weathering, coating system will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

**SECTION 32 31 00
FENCES AND GATES**

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Description of Work
- B. Chain Link Fencing Installation
- C. Removal and Replacement of Existing Fences

1.02 DESCRIPTION OF WORK

- A. This section shall include the furnishing of materials, erection, and installation of new chain link fencing and gates, the relocation of existing fences and gates, and all incidental work necessary for completed fencing work as specified in the contract documents. Fence fabric shall be galvanized with bonded black vinyl coating per requirements.
- B. Fence posts are to be set in pre-established holes set into the aggregate subbase, and recovered by core drilling after the bituminous surface has been constructed, prior to the vinyl application.
- C. Fencing contractor shall power wash the asphalt surface after core drilling and concrete operations are finished prior to vinyl applications.

1.03 SUBMITTALS

- A. Submit catalog cuts/certifications of fence products showing materials meet specifications.
- B. Submit operation sequence to predrill and recover post holes.

1.04 RELATED SECTIONS

- A. Section 11 68 23.33 – Tennis Equipment
- B. Section 26 06 00 – Schedule for Electrical
- C. Section 31 10 00 – Site Clearing
- D. Section 31 23 00 – Excavation and Fill
- E. Section 31 25 00 – Erosion and Sediment Control
- F. Section 32 13 13 – Exterior Concrete
- G. Section 32 13 16 – Asphalt Pavement
- H. Section 33 41 00 – Utility Storm Drainage Piping
- I. Section 33 46 16 – Sub-Drainage Piping

1.05 SPECIAL REQUIREMENTS

- A. Provide chain link fencing and gates as completed units constructed by a single source including necessary erection accessories, fittings, and fastenings.
- B. Similar parts with different shapes or protective coatings shall not be intermingled within the Project.
- C. Comply with the Voluntary Standard for Chain Link Fence Installation as per Chain Link Fence Manufacturer's Institute (CLFMI).

PART 2 - PRODUCTS

2.01 MATERIALS

- A. The Contractor shall provide all new fabric and framework with fittings, accessories, fasteners, wire, and gates to match, of the size and finish specified.
- B. Fabric
 - 1. Contractor shall provide 9 ga. galvanized steel wire in accordance with ASTM A

817, Class 2, Type 2. Knuckle –Knuckle selvage.

2. Product shall be 2 oz./sf. galvanized 9 gage wire fabric of the height specified, knuckle-barb selvage.

- C. Posts, Rails, And Braces: Either hot-rolled or cold-rolled posts, rails, and braces shall be used and be the lengths shown on the plans and/or details. The steel strip used in the manufacture of the pipe shall conform to ASTM A 1011.

Hot-Rolled Manufactured Posts, Rails, and Braces (Type I Pipe):

1. No used, rerolled or open seam material will be permitted in posts or rails.
2. Posts, rails, and braces shall be galvanized standard weight steel pipe meeting requirements of ASTM A 53 of the lengths shown on the plans and Standard Detail Plates.
3. Unless otherwise specified, the following nominal sizes for the respective uses are to be provided:

USE IN FENCE	HOT ROLLED (TYPE I PIPE) FENCE HEIGHT					
	48" & Under		Greater than 48" to 96"		Greater than 96"	
	Outside Diameter (inches)	Weight (lb/ft)	Outside Diameter (inches)	Weight (lb/ft)	Outside Diameter (inches)	Weight (lb/ft)
Line Post	2	2.74	2 1/2	3.65	3	5.79
*Terminal Post	2 1/2	3.65	3	5.79	4	9.11
Top/Intermediate/ Bottom Rail & Bracings	1 5/8	2.28	1 5/8	2.28	1 5/8	2.28
** Gate Post						
*Includes corner, angle, brace, and pull posts.						
**As shown on Standard Detail Plates.						

- D. Cold-Rolled Manufactured Posts, Rails, and Braces (Type II - Pipe):

1. The pipe shall be manufactured by cold rolling electric resistance welding and shall be given corrosion protection by in-line application of hot-dip galvanized zinc, followed by a chromate conversion coating and electrostatically sprayed thermoplastic acrylic coating on the outside surface.
 - a. Hot-dipped zinc coating per ASTM B 6 high grade and special high grade. The weight of the hot-dipped zinc coating shall be 1.0 ounce/foot² ± 0.1. The weight of zinc coating shall be determined in accordance with ASTM A 90.
 - b. Chromate conversion coating: The chromate coating weight shall be 30 micro-grams/square inch ± 10 micro-grams/inch². The coating weight shall be determined by a quantitative method.
2. The inside surface shall be given corrosion protection by in-line application of a full zinc base organic coating after fabrication.
3. Unless otherwise specified, the following nominal sizes for the respective uses are to be provided:

USE IN FENCE	COLD ROLLED (TYPE II PIPE) FENCE HEIGHT					
	48" & Under		Greater than 48" to 96"		Greater than 96"	
	Outside Diameter (inches)	Weight (lb/ft)	Outside Diameter (inches)	Weight (lb/ft)	Outside Diameter (inches)	Weight (lb/ft)
Line Post	2	2.28	2 1/2	3.11	3	4.64

	COLD ROLLED (TYPE II PIPE) FENCE HEIGHT					
	48" & Under		Greater than 48" to 96"		Greater than 96"	
*Terminal Post	2 1/2	3.11	3	4.64	4	6.56
Top/Intermediate/ Bottom* Rail & Bracings	1 5/8	1.84	1 5/8	1.84	1 5/8	1.84
*Includes corner, angle, brace, and pull posts.						

*Use Bottom rail on all fences.

2.02 FITTINGS

- A. All special fittings except aluminum fittings, shall have a galvanized coating applied by the hot-dip process of not less than 0.8 ounce per square foot.
- B. Braces shall be attached to posts by fittings that will hold both post and brace rigidly.
- C. Diagonal tension rods shall be 3/8-inch round steel rods with an appropriate commercial means for tightening.
- D. A locknut or other device shall be provided to hold the tightening device in place.
- E. A suitable sleeve or coupling device, recommended by the manufacturer, shall be provided to connect sections of top rail and shall provide for expansion and contraction.
- F. Posts shall be provided with a suitable cap which is secured. Stretcher bars not less than 3/8-inch diameter, or equivalent cross-section area, with suitable clamps shall be used for attaching fabric to corner, end, or gate posts.

2.03 BOTTOM TENSION WIRE (Not Applicable)

- A. No. 7 gauge hot-dipped galvanized wire or aluminum-coated steel wire shall be used on fences 48" and lower. Coatings shall meet requirements of 64-2.1, Fabric Material.
 1. Minimum weight of galvanized coating shall be 0.40 ounce per square foot of wire surface.
 2. Minimum weight of aluminum coating shall be 0.25 ounce per square foot.

2.04 FASTENERS

- A. Fasteners to attach the fabric to braces and rails shall be aluminum 9-gauge tie wires. Each end of the tie wire will be secured to the fabric with a double turn.

2.05 GATES

- A. The type and width of gates shall be as specified on the plans, details or special provisions.
- B. Gates shall be double swing or single swing as shown on the plans and be erected in conformance with ASTM F-900, Standard Specification for Industrial and Commercial Swing Gates.
 1. All gates shall have sufficient hardware and durability to withstand repeated cycles, fit to open and close without binding with allowance for hot and cold temperatures, and be lockable with a commercial grade heavy duty pad lock.
 2. Hinges shall be heavy duty steel and adjustable to provide smooth swing operation.
 3. Double swing gates shall have a drop rod or plunger bar that locks with the gate and prevents movement of the gate when closed. The receiving device in the roadway shall not extend above the roadway surface.
 4. Double gates shall have gate keepers that secure the gates when open. Gate keepers shall be a mechanical device attached to a galvanized steel pipe or beam 42" long and set in concrete.

2.06 CONCRETE

- A. All concrete used shall have a minimum compressive strength of 4,000 psi at 28 days.

2.07 WINDSCREEN

- A. The exterior perimeter section of fencing, (6 courts) (the entire length of exterior perimeter fence shall have wind screen attached from the top to within 1 foot of the bottom (ten-foot width). Refer to Section 32 12 16 - Asphalt Pavement for Product requirements.

PART 3 - EXECUTION

3.01 CHAIN LINK FENCING INSTALLATION

- A. General:
 - 1. Construct fencing and gates at the location and height as shown on the plans and in accordance with the contract documents.
 - 2. Installation to conform to ASTM F 567.
 - 3. Construct all posts plumb in alignment, and with the top of fabric conforming to the proposed ground surface.
- B. Posts:
 - 1. Post Spacing: Place posts in the line of the fence with equal spacing not to exceed 10 feet on center.
 - 2. Post Setting:
 - a. Posts shall be set in a concrete foundation as specified on Standard Details.
 - b. All posts are to be set plumb and shall be set not less than 24 hours prior to stretching the fabric.
 - c. Top of footing to be 1 inch above grade and sloped to direct water away from posts. Footing to be uniform size full depth without flair at top of grade, to prevent frost heave.
 - d. Gate post foundation shall be as specified on the Standard Detail Plates.
 - e. All terminal, corner, angle, pull, and gate posts shall be set with the required brace-post assembly as shown on the Standard Detail Plates.
- C. Rails:
 - 1. Top Rail: The top rail shall pass through the base of the line post caps and form a continuous brace from end to end of each stretch of fence. The top rail shall be securely fastened to the terminal posts by pressed steel connectors.
 - 2. Intermediate Rail (When Specified): The intermediate rail (when specified) shall be securely fastened between all line posts and terminal posts with pressed steel fasteners.
- D. Braces:
 - 1. Braces shall be securely fastened to the post by means of malleable iron or pressed steel connections, then trussed from the line post back to the end, gate, or corner post.
 - 2. The diagonal tension rod (truss rod) shall be tightened to produce proper tension.
- E. Pull Posts:
 - 1. Pull posts shall be placed midway between end, angle, corner, and gate posts as necessary so that no section of fence longer than 300 feet shall be constructed with line posts only.
 - 2. Pull post sizes shall conform to sizes defined as terminal posts.

- F. Fabric
 - 1. Fabric shall be installed on the inside of the posts from the area being fenced.
 - 2. Pull fabric taut with bottom salvage a maximum of 1 inch above grade.
 - 3. Each end of each run of chain link fabric shall be tightened and secured by a stretcher bar inserted in the final link of the fabric.
 - 4. The length of the stretcher bar shall be the same as the width of the fabric. This bar and the tight fabric shall be secured to the end post by tension bands equally spaced not more than 15 inches apart.
 - 5. The chain link fabric shall be attached securely to the braces top rail, tension wire, and all intermediate posts at intervals of not more than 15 inches by wire ties or bands.
 - 6. The ground surface along the line of the fence shall be uniformly smoothed for a width of 2 feet so that the fabric will conform to the ground surface.
- G. Bottom Tension Wire (Not applicable):
 - 1. Bottom tension wire shall be stretched taut from terminal post to terminal post and securely fastened to each intermediate post 1 inch above the lower edge of fabric.
 - 2. Tension wire shall be attached to the fence fabric with approved wire ties or clamps every 12 inches.
- H. Gates: Gates shall be erected as shown on the plans and the Standard Detail Plates.
- I. Electrical Grounds
 - 1. Electrical grounds shall be constructed where a power line passes over the fence or at 500-foot intervals or at least one location, whichever is more restrictive.
 - 2. The ground shall be accomplished with a copper-clad rod 8 feet long and a minimum of 5/8 inch in diameter driven vertically until the top is 6 inches below the ground surface.
 - 3. A No. 6 solid copper conductor shall be clamped to the rod and to the fence in such a manner that each element of the fence is grounded.
 - 4. Installation of ground rods shall not constitute a pay item and shall be considered incidental to fence construction.

3.02 TEMPORARY FENCE (Not Required by Contract)

- A. Temporary fence is not required per the contract general conditions. At various locations it may be necessary to temporarily remove fences for access. These are to be replaced at the contractors' expense when work is complete. If these are security fences, a temporary fence will be required during non-work hours.

3.03 CLEANUP

- A. Perform cleanup operations during installation of work and upon completion of work.
- B. Remove from site all excess materials, debris, and equipment.
- C. Hose down and/or broom clean all paved surfaces.
- D. Repair any damage resulting from fencing operations.

END OF SECTION