CHEROKEE NATION
ON-SITE SEWAGE TREATMENT SYSTEMS
SECTION 02315
EXCAVATION, TRENCHING AND BACKFILL

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Excavation, trenching, and backfill necessary for the construction of the facilities as indicated on the plans including, but not limited to water mains and service lines, sewer mains and service lines, concrete manholes, septic tanks, and other structures.

1.02 REFERENCES

A. Reference latest manual revision or ASTM standard.

B. Manual on Uniform Traffic Control Devices.

C. ASTM D698 – Test Method for Laboratory Compaction Characteristic of Soil Using Standard Effort.

D. ASTM D1556 – Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

E. ASTM D1557 – Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.

F. ASTM D2922 – Test Method for Density of Soil and Soil Aggregate in Place by Nuclear Methods.

G. ASTM D2487 – Classification of Soils for Engineering.

H. ASTM D3017 – Test Method for Water Content of Soil and Rock in Place by Nuclear Methods.

1.03 SUBMITTALS (if required)

A. Barricades and lights
B. Shoring
C. Imported bedding material

1.04 DEFINITIONS

A. Soil Materials as summarized in the following table and defined in ASTM D2321 and ASTM D2487.

Description and Comparison of Soil Material Classifications			
ASTM D2321		ASTM D2487	
Class	Type	USCS Group Symbol	Description
IA	Manufactured aggregates: ¼ to 1 ½ inch open graded, clean.	* None	Closest to "Poorly graded gravel (GP)"
IB	Manufactured aggregates: ¼ to 1 ½ inch dense graded, clean.	* None	Closest to "Poorly graded gravel with sand (GP)"
II	Coarse sands and gravels with maximum particle size of 1 ½ inch clean.	GW	Well-graded gravels and gravel-sand mixtures; little or no fines.
		GP	Poorly graded gravels and gravel sand mixtures little or no fines.
		SW	Well-graded sands and gravelly sands; little or no fines.
		SP	Poorly graded sands and gravelly sands; little or no fines
	Coarse sands and gravels with maximum particle size of 1 ½ inch, borderline clean.	GW-GC SP-SM Etc.	Sands and gravels which are borderline between clean and with fines
III	Fine sand and clayey gravels.	GM	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravels, gravel-sand-clay mixtures
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
IV	Fine grained soils (inorganic)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays
		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays.
V	Organic soils	OL	Organic silts and organic silty clays of low plasticity
		OH	Organic clays of medium to high plasticity, organic silts

	PT	Peat and other high organic soils
* USCS system is limited to naturally occurring soils. Manufactured aggregates not covered.		

PART 2 - PRODUCTS

2.01 BEDDING, HAUNCHING AND INITIAL BACKFILL MATERIAL

A. Class I, Class II or Class III, utilized in accordance with restrictions described in Part 3 - Execution.

PART 3 - EXECUTION

3.01 GENERAL

A. Conform to recommended safety standards, identified, but not limited to, OSHA 1910 and 1926.

B. No workers may enter any trench or excavation without the prior approval of the Competent Person on site.

C. Obtain all permits from appropriate road agency for construction within road right of way.

D. Repair damage resulting from settlement, slides, cave-ins, water pressure, and other causes.

E. Provide adequate signs, barricades, fences, and amber lights and take all necessary precautions to protect the work and the safety of the public in all construction areas.

1. Placement of construction signs and barricades shall conform to the “Manual on Uniform Traffic Control Devices.”

2. Protect barricades and obstructions at night by amber signal lights that burn from sunset to sunrise.

3. Barricades

a. White or with reflective paint to increase their visibility at night.

b. Commercial grade.

4. Minimize obstruction to traffic and inconvenience to the public and residents near the work.

F. Road, Driveway, and Sidewalk Crossing:

1. Comply with all construction and material requirements of roadway authorities having jurisdiction.

2. Maintain one open lane of traffic at all times.

3.02 PREPARATION

A. Layout and Staking:

1. Lines and building location sites established and staked by the Project Officer.

2. Notify the Project Inspector at least three business days in advance of the times and places that stakes and benchmarks will be required.

3. Preserve stakes and benchmarks when set. Re-staking for disturbed or displaced stakes shall be at the Contractor's expense.

B. Close no road or street without permission of the proper authority.

C. Keep fire hydrants accessible.

D. Insure that gutters, sewer inlets, drainage, and irrigation ditches are kept functional.

3.03 PROTECTION OF EXCAVATION

A. Provide suitable sheathing, shoring, and/or bracing to:

1. Prevent excavation from caving.
2. Provide safe working conditions to protect workers and property.

B. Repair damage resulting from settlement, slides, cave-ins, and water infiltration at Contractor's expense.

3.04 GENERAL EXCAVATION

A. Excavate by open cut method unless otherwise approved by the Project Inspector or as required by applicable encroachment permits.

B. Remove trees and stumps from excavation and site according to Section 02230 – Clearing and Grubbing.

C. Remove and stockpile existing topsoil and suitable backfill.

D. Dispose of unsuitable backfill at the location shown in the Drawings or as approved by the Project Inspector.

E. Dispose of excess material, including rock, broken concrete and bituminous materials, debris, at the location shown in the Drawings or as approved by the Project Inspector.

3.05 PIPE LINE EXCAVATION

A. Install facilities as staked unless otherwise approved by Project Inspector.

B. Maintain surface drainage away from trenching or excavation.

3.06 STRUCTURE EXCAVATION

A. Install facilities as staked unless otherwise approved by Project Inspector.

B. Maintain surface drainage away from excavation.

C. Maintain a minimum 1-foot clearance between outer surface of structure being installed and wall of excavation unless concrete for walls, floors, and footings are authorized to be placed directly against excavated surfaces.

D. Restore unauthorized over excavation at Contractor's expense.

1. Restore to proper elevation by filling with approved granular bedding material.

E. Conform to paragraph 3.08 for backfill around structures unless requirements that are more stringent are indicated in other sections of the specifications.

F. Compact in 12-inch, loose measure lifts, to a density not less than the density of the surrounding undisturbed soil unless more stringent requirements are indicated in other sections of the specifications.

3.07 TRENCHING

A. Bottom width: No less than 12 inches or more than 24 inches wider than the outside diameter of the pipe.

B. Remove large stones, ledge rock, and boulders to provide a 4-inch minimum clearance for all pipe.

C. Keep walls as nearly vertical as soil conditions permit below the top of pipe.

D. Trench width above pipe may be as wide as required for shoring and sheeting, and proper installation of work.

E. Ensure trench is on proper alignment and center pipe within the trench.

F. Depth: Provide minimum cover identified in the specifications, or to depths shown on plans.

G. Accurately shape bottom of trench to provide uniform bearing and support for pipe.

H. Excavate bell holes and depressions for joints after bottom of trench is graded.

1. Excavate bell holes and depressions to the minimum length, depth, and width required to make the particular joint.

3.08 BEDDING

A. If existing soil cannot provide uniform, stable bearing support, over-excavate 4 inches below bottom of pipe or structure.

B. Embedment and the backfill up to 6 inches above the pipe crown shall be done in the presence of the Project Officer or his/her representative.

1. Violation of this provision will require the removal and replacement of the backfill at Contractor's expense, even if backfill was correctly placed and compacted.

C. Compact in lifts not to exceed 6 inches in loose measure.

D. Utilize Class I, II, or III materials as appropriate for bedding as listed in the following table.

Use of Soils and Aggregate for Bedding				
	Class IA	Class IB	Class II	Class III
General	Excellent pipe support. Excellent drainage.	Excellent pipe support. Good drainage. Minimizes migration of adjacent material.	Good pipe support. Fair drainage.	Reasonable pipe support. Poor drainage
Compaction	Not required	Not required	Required 85% of Standard Proctor.	Required 90% of Standard Proctor.
Wet Conditions (below current or future water table). Rock Cuts	Acceptable. Must use same material for Haunching.	Acceptable. Must use same material for Haunching.	Acceptable. Clean groups only suitable for drainage blanket.	Not- Acceptable
Dry Conditions	Acceptable	Acceptable	Acceptable	Acceptable

3.09 HAUNCHING AND INITIAL BACKFILL

A. General

1. Provide imported backfill if native soil is unsuitable for haunching and initial backfill.
   a. Unsuitable native soil id defined as solid or loose rock, dry or frozen lumps greater than ¾ inches in diameter (in any dimension), or containing organic material, or any other material that could damage the pipe.

2. Provide complete and uniform bearing and support for the pipe, including allowance for bell holes, or structure.

3. Work material under and around the pipe to ensure full pipe support.

4. Hand-tamp to prevent movement of the pipe during placement of material.

5. Compact in lifts not to exceed 6 inches in loose measure.

6. Avoid contact between the pipe and compaction equipment.

B. Utilize Class I, II, or III materials as appropriate for haunching and initial backfill as listed in the following table. No frozen materials or frozen clods will be permitted.

Use of Soils and Aggregate for Haunching and Initial Backfill				
	Class IA	Class IB	Class II	Class III
General	Excellent pipe support. Excellent drainage. Install to a minimum of 6” above the pipe crown.	Excellent pipe support. Good drainage. Minimizes migration of adjacent material. Install to a minimum of 6” above the pipe crown.	Good pipe support. Fair drainage. Install and compact to a minimum of 6” above the pipe crown.	Reasonable pipe support. Poor drainage. Install and compact to a minimum of 6” above the pipe crown.
Compaction	Not required	Not required	Required 85% of Standard Proctor. 6-inch maximum lifts.	Required 90% of Standard Proctor. 6-inch maximum lifts.
Wet Conditions (below current or future water table). Rock Cuts	Acceptable. Must use same material for Bedding. Extend Haunching to the top crown of the	Acceptable. Must use same material for Bedding. Extend Haunching to the top crown of the pipe.	Acceptable. Clean groups only suitable for drainage.	Not- Acceptable

	pipe.			
Dry Conditions	Acceptable	Acceptable	Acceptable	Acceptable

3.10 FINAL BACKFILL

A. Provide imported backfill if native soil is unsuitable for final backfill.

1. Unsuitable native soil is defined as solid or loose rock, dry or frozen lumps greater than 6 inches in diameter (in any dimension) or containing organic material, or any other material that could damage the pipe.

B. Backfill remainder of excavation with native material, free from large clods, large stones, organic material or frost chunks.

C. Compact in 12-inch, loose measure, lifts to a density not less than the density of the surrounding undisturbed soil.

1. Provide 3 feet minimum of backfill over the pipe before wheel loading the trench.

2. Wheel roll and mound except as otherwise required by the applicable roadway authority or permits.

D. Backfill and compact around manholes, valve boxes, and other appurtenances in 12-inch, loose measure lifts.

1. Compact with a mechanical tamper to a density not less than 90% of the maximum dry density, determined by ASTM D 698.

E. Backfill around septic tanks in 18-inch lifts.

1. Compact in a manner that will not produce undue strain on the tank.

2. Compaction may be accomplished with the use of water, provided the material is thoroughly wetted from the bottom up, and the tank is filled with water to prevent floating.

F. Repair any trenches improperly backfilled or where settlement occurs, then refill and compact.

G. Restore surface to the required grade and compaction. Conform to Section 02310 – Grading.

H. Remove all surplus backfill materials to the location shown in the Drawings or as approved by the Project Inspector.

3.11 REMOVAL OF NUISANCE WATER

A. Remove nuisance water entering the trenches. Nuisance water that can be removed through the use of sump or trash pumps is not considered dewatering.

B. Keep trenches free from water until the facilities are in place, sealed against the entrance of water, and backfill has been placed and compacted above the water level.

3.12 LOCATE EXISTING UTILITIES

A. Field locate all existing underground utilities.

1. Utilize state “dig-safe,” “OKIE” or “one-call” hotlines.

2. Contact all other utility owners not covered by the state “dig safe” hotlines.

3.13 UTILITY CONFLICTS

A. Protect existing utilities from damage during excavation and backfilling operations.

B. Provide temporary support for existing water, gas, telephone, power, or other utility services that cross the trench, until backfilling operations have reached the elevation of the utility being crossed.

1. Compact backfill to 95% of Standard Proctor Density under disturbed utilities.

2. Repair or replace any damaged existing utilities at Contractor’s expense.

C. Pipe separation.

1. Horizontal Separation from existing or proposed mains:

a. Maintain a 10-foot horizontal separation (O.D. to O.D.) for the following:

(1) Water mains
(2) Sewer mains
(3) Storm sewers
(4) Raw water lines
(5) Oil and gas lines
(6) Buried electric cables

b. Maintain a 15-foot horizontal separation for the following:

(1) All parts of septic tanks
(2) Absorption fields
(3) Any other sewage treatment and disposal systems.

c. Maintain a 50-foot horizontal separation from any gas storage tank.

d. Any deviation must be approved in advance by the Project Officer and permitting authority.

2. Vertical Separation

a. Vertical crossing with the water main above the sewer main:

(1) Maintain a minimum 24-inch vertical separation (O.D. to O.D.) for crossing mains.

(2) Lay pipe with joints equidistant from the point of crossing.

b. Vertical crossing with the water main below the sewer main.

(1) Maintain a minimum 24-inch vertical separation (O.D. to O.D.) for crossing mains.

(2) No sewer line joint closer than 9 feet from the water line.

(3) Provide adequate support to prevent damage to the water main.

c. If it is impossible to meet any of the above separation distances and deviations, the following method shall be adhered to:

(1) Sewer main shall be constructed to water main pressure pipe standards, and successfully pass a 150-psi pressure test prior to backfilling.

D. Water and sewer service crossing and parallel installation.

1. Maintain a 30-inch horizontal separation from water and sewer services.

2. Maintain a 12-inch vertical separation for crossing water and sewer services.

3. Water service line splices or joints will not be permitted within 10 feet of a sewer line crossing.

3.14 MOVING FENCES AND MINOR STRUCTURES

A. Remove and reset culverts, drainage pipes, or other minor structures that fall within the alignment of the new construction. Restore to their original location and grade.

B. Visit the project site and determine actual conditions with regard to the existence of old car bodies, abandoned houses, fences, driveways, trees, stumps, brush, sidewalks, approaches, and other miscellaneous obstacles to construction.

1. No separate payment will be made for the removal or replacement of these items.

END OF SECTION

CHEROKEE NATION
ON-SITE SEWAGE TREATEMENT SYSTMES
SECTION 02316
ROCK EXCAVATION

PART 1 - GENERAL

1.01 SUMMARY

A. This section pertains to the rock excavation necessary for the construction of the facilities as indicated on the plans including:

1.02 RELATED WORK

A. Section 01330 – Submittal Procedures

B. Section 02315 – Excavation, Trenching and Backfill

1.03 SUBMITTALS

A. Contractors blasting license and/ or blasting permit (if applicable).

1.04 DEFINITION

A. Solid Rock

1. Large masses of rock which, in the opinion of the Project Inspector, cannot be excavated without drilling, blasting, ripping equipment or other specialized equipment.

B. Loose Rock

1. Boulders and other detached stones each having a volume of 1-cubic yard or more.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 METHODS OF EXCAVATION

A. Rock excavation may be accomplished by any or all of the following methods depending on the rock type:

1. Excavation with earthmoving equipment including ripping with a dozer.

2. Jack-hammering

3. Blasting

3.02 RESPONSIBILITIES

A. Comply with laws, ordinances, applicable safety code requirements, and regulations relative to the handling, storage, and use of explosives.

B. Current Oklahoma blasting license required.

C. Secure necessary permits and submit to Project Inspector.

D. Protect adjacent utilities lines, property, and structures from blasting operation.

E. Repair damage caused by rock excavation operations.

F. Remove excavated rock from site unless otherwise directed by the Project Engineer.

3.03 ROCK MEASUREMENT

A. Determine rock profile by one of three methods:

1. Excavating and exposing the rock, prior to blasting.

2. Drilling prior to excavating and blasting.

3. Blasting and excavating, then measuring rock. Note: 20% reduction in rock volume shall be factored in to account for expansion.

4. Measure solid rock to the nearest 0.1 foot from the surface and no less than every ten feet along the rock profile.

B. Trenches

1. Take measurements from the top of the rock to a point 6 inches below the invert of the pipe and 12 inches from each side of the pipe or appurtenance with a maximum 30-inch trench width allowed.

C. Structures

1. Take measurements starting at 24 inches from the edge of the structure.

2. Measure quantity of loose rock in cubic yards.

3.04 EXCAVATION AND JACK-HAMMERING

A. Excavate a minimum 4 inches deeper than the pipe invert.

B. Refill trench to the required elevation with material in accordance with Section 02315 – Excavation, Trenching, and Backfill.

3.05 BLASTING

A. Blast in accordance with OSHA guidelines.

B. Comply with conditions of blasting permit.

END OF SECTION

CHEROKEE NATION
SANITARY SEWER CONSTRUCTION SPECIFICATIONS
SECTION 02531
SANITARY SEWER SERVICE LINES

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes sewer service lines, connection to sewer mains, wyes, cleanouts, and appurtenances.

1.02 RELATED WORK

A. Section 01330 – Submittal Procedures

B. Section 01770 – Closeout Procedures

C. Section 01780 – Closeout Submittals

D. Section 02230 - Clearing And Grubbing

E. Section 02310 – Grading

F. Section 02315 – Excavation, Trenching and Backfill

G. Section 02531 – Sewer Service Lines

H. Section 02532 – Sanitary Sewer Manholes

I. Section 02920 – Topsoiling, Seeding, Fertilizing, and Mulching

1.03 REFERENCES

A. ANSI/AWWA C110 / A21.10 – Ductile-Iron and Gray-Iron Fittings, 3 Inch Through 48 Inch, for Water and Other Liquids

B. ANSI / AWWA C111 / A21.11 – Rubber Gasket Joints for Ductile Iron and Gray-Iron Pressure Pipe and Fittings

C. ANSI / AWWA C151 / A21.51 – Ductile Iron Pipe, Centrifugally Cast, for Water or Other Liquids

D. ASTM D 1248 – Polyethylene Plastics Molding and Extrusion Materials

E. ASTM D 2321 – Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

F. ASTM D2487 – Classification of Soils for Engineering

G. ASTM D 3034 – Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings

H. ASTM D 3212 – Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

I. ASTM F 477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe

J. ASTM F1336 – PVC Gasketed Sewer Fittings

K. ASTM F 1417 – Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air

L. Oklahoma Department of Environmental Quality 252-656-5 Sanitary Sewer Standards

1.04 SUBMITTALS

A. Submit in accordance with Section 01330 – Submittal Procedures

B. Pipe

C. Fittings

D. Sewer Wyes

E. Saddles

F. Service Line Cleanout Plugs

PART 2 - PRODUCTS

2.01 SEWER SERVICE LINE MATERIALS

A. Polyvinyl Chloride (PVC) Pipe and Fittings

B. Conform to ASTM D 3034

C. Pipe Class: SDR 35 or Schedule 40

D. Bell ended joints conforming to ASTM D 3212

E. Elastomeric gaskets conforming to ASTM F 477

F. Material: 4-inch nominal diameter unless otherwise indicated except as follows:

1. As required by the roadway authority or permit.

G. Each length of pipe shall be clearly marked with the following:

1. Manufacturer

2. Nominal Pipe Size

3. The PVC Cell Classification

4. Type PSM PVC Sewer Pipe

5. ASTM Designation

6. Pipe Class

H. Ductile Iron Sewer Pipe and Fittings

1. Conform to AWWA C151.

2. Pipe Thickness Class: 52

3. Exterior Coating: asphaltic coating, 1 mil thick, minimum

4. Rubber gasket, push on joints conforming to ASTM C111

5. Interior Lining: Polyethylene meeting ASTM D 1248, fusion bonded

6. Each length of pipe shall be clearly marked with the following:

a. Manufacturer

b. Nominal Pipe Size

c. ASTM Designation

d. Pipe Class

I. Service Line Cleanout Plug: Cast iron or PVC as shown on the Drawings.

J. Sewer Wyes

1. Connection to New Sewers

a. In-line fittings conforming to ASTM F1336.

2. Connection to Existing Sewers

    a. PVC Sewer Mains

        (1) PVC conforming to ASTM 3034, watertight with gasket.

        (2) Two stainless steel bands and connectors for securing to the main.

        (3) GPK Products, Fargo, ND, or approved equal.

    b. Asbestos-Cement, Concrete, or Vitrified Clay Sewers

        (1) Neoprene rubber boot with stainless steel bands for concrete, asbestos-cement or vitrified clay sewer main.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that all products are in new condition.

B. Inspect pipe and fittings for defects.

C. Remove materials from the site that are defective, damaged, used, unsound, or that otherwise do not meet the specifications.

3.02 PERMITS

A. Provide permits for roadway crossing, connections to existing sewer mains, construction, or any other permit or fee required to complete the service line unless otherwise directed, in writing, by the Project Inspector.

B. Notify the Project Inspector if this specification does not conform to the permit requirements.

C. Follow the requirements of the permit if they differ from this specification.

3.03 UTILITY CONFLICTS

A. Refer to Section 02315 – Excavation, Trenching and Backfill.

3.04 SEPARATION DISTANCE

A. Vertical: refer to Section 02315 – Excavation, Trenching and Backfill.

B. Horizontal

1. Water lines: Refer to Section 02315 – Excavation, Trenching and Backfill.
2. Public water supply wells: 300 feet.
3. Private water wells: 50 feet.
4. Oil tanks: 50 feet.
5. Petroleum and electrical lines 5 feet.

3.05 PIPE LENGTH

A. Use the longest standard pipe length available.

3.06 PIPE BEDDING

A. Refer to Section 02315 – Excavation, Trenching and Backfill.

3.07 COMPACTION

A. Refer to Section 02315 – Excavation, Trenching and Backfill.

3.08 SEWER SERVICE LINE INSTALLATION

A. Saddles

1. Install saddle wyes at the locations indicated by the Drawings or by the Project Officer.

2. Repair damage caused during the tapping process at no additional cost.

3. Rotate the branch or wye of the saddle no more than 45 degrees from horizontal.

B. Risers

1. Construct as shown on the standard details.

2. Extend riser from sanitary wye to an elevation that will allow a service line to be laid at specified grades.

3. Install riser at an angle equal to or less than 45 degrees measured from horizontal.

4. Risers in Rock Trenches

a. Install riser pipe in the sewer trench.

b. Install riser pipe approximately vertical.

5. Encase the bottom of riser, wye, and 45 degree bend in crushed rock or sand.

6. Extend bedding the full width of the trench as excavated and not less than 18 inches in length from either side of the center of the riser.

7. Place bedding material to a point 12 inches above centerline of the sewer main at the location of the wye.

8. No separate payment will be made for risers.

3.09 SERVICE LINES

A. Furnish and install sewer service lines at the locations on the Drawings or as directed by the Project Officer.

1. Connect to the existing home sewer stub out if present.

2. Cap sewer service, and stake if no connection is made.

a. Properly reference, record and stake wye locations to permit ready relocation, in accordance with Section 01780 – Closeout Submittals.

B. Follow general pipe installations requirements of Section 02315 – Excavation, Trenching and Backfill.

C. Minimum slope for sewer service lines is 1/8-inch per foot (1%).

D. Maximum slope for sewer service lines is ½-inch per foot (4%).

E. Ninety-degree bends are not allowed between the house and the sewer main.

3.10 CONNECTION OF SEWER SERVICE LINES TO MANHOLES

A. Connect to manholes only where permitted and approved by the Project Officer.

B. Conform to Section 02532 – Sanitary Sewer Manholes, concerning channel shape and radius.

3.11 SEWER SERVICE LINE CLEANOUTS

A. Construct as shown on the standard details.

B. Two-Way Cleanouts

1. Install two-way cleanouts at a spacing not to exceed 200 feet.

2. Install two-way cleanouts so that the service can be rodded or snaked in either direction.

C. One-Way Cleanouts

1. Install one-way cleanouts at a spacing not to exceed 100 feet.

2. Install one-way cleanouts so that the service can be rodded or snaked in the direction of flow.

D. Install a 4-inch sewer wye in the sewer service line and connect risers of the same material from the wye to the ground surface.

E. Attach a schedule 40 PVC adapter and threaded plug to the end of the riser.

F. The Project Inspector may specify that cleanouts be buried 3 to 6 inches below grade and be fit with a threaded cast iron plug.

G. Provide a 12-inch by 12-inch by 4-inch thick concrete pad for each PVC threaded plug.

1. Concrete to conform to Section 03300 – Cast-in-place Concrete (Non-Structural).

2. Provide wood or other forms for concrete placement.

3. Set top of pad to finished grade.

4. Provide a hard smooth finish to top of pad.

5. Remove forms after concrete has cured enough to retain its shape.

3.12 TESTING

A. Connection to new sewer main installation

1. Pressure test with sewer main, under provisions of Section 02530 – Sanitary Sewer.

B. Connection to existing sewer main

1. Visual inspect each joint for leakage.

2. Repair all leaks before backfilling.

3.13 SITE RESTORATION

A. Restore site to original condition.

B. Finish grade site in conformance with Section 02310 – Grading

C. Restore roadways in conformance with Section 02705 – Road Restoration.

D. Reseed the trench in conformance with Section 02920 – Topsoiling, Seeding, Fertilizing, and Mulching.

3.14 RECORD DRAWINGS

A. Provide as-built information on each system in accordance with Section 01780 – Closeout Submittals.

END OF SECTION

CHEROKEE NATION
ON-SITE SEWAGE TREATMENT SYSTEMS
SECTION 02920
TOPSOILING, SEEDING, FERTILIZING, AND MULCHING

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes topsoiling, seeding, fertilizing, and mulching areas disturbed by construction activities.

1.02 RELATED WORK

A. Section 02310 – Grading
B. Section 02315 – Excavation, Trenching, and Backfill

1.03 REFERENCES

A. U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act.

1.04 SUBMITTALS

A. Conform to the Section 01330 – Submittal Procedure.
B. Seed Mixture
C. Fertilizer

PART 2 - PRODUCTS

2.01 TOPSOIL

A. Natural loam, sandy loam, silt loam, silty clay loam, or clay loam humus-bearing soils adapted to the sustenance of plant life.

B. Use previously stockpiled topsoil.

2.02 FERTILIZER

A. 20-10-10 mixture of 20% Nitrogen, 10% Phosphorous, and 10% Pot Ash.

2.03 SEED MIXTURE

A. April through June: Bermuda grass seed.

B. July through March: blend of Kentucky 31, Fescue, and annual rye grass.

2.04 MULCHING MATERIAL

A. Prairie (native) hay, not more than 2 years old and free of noxious weeds.

PART 3 - EXECUTION

3.01 TOPSOIL

A. Place a minimum of 4 inches of topsoil over area to be seeded.

3.02 FERTILIZING

A. Apply using mechanical equipment.

B. Uniformly distribute.

C. Incorporate into soil using harrow or other suitable equipment.

D. Conform to recommendations of local county extension agent.

E. Fertilize the area at an application rate of 200 pounds per acre.

3.03 SEEDING

A. Sow seed using either equipment suited to that purpose or scatter seed uniformly over area with hand seeders when the weather is sufficiently quiet to prevent seeds from blowing away.

B. Plant when soil temperature is 60^{o} F or greater.

C. Application rate

1. 200 pounds per acre of the Kentucky 31, fescue and rye grass, 100 pounds per acre of the Bermuda seed.

D. Lightly rake soil to cover the seed with approximately ¼-inch of soil.

3.04 MULCHING

A. Place hay mulching on seeded area loose enough to allow some sunlight to penetrate and air to circulate but thick enough to shade the ground, conserve soil moisture, and prevent/reduce erosion.

B. Do not perform mulching activities during periods of excessively high winds, which would preclude the proper placing of the mulch.

C. Apply straw or hay uniformly over the disturbed area to a loose depth of ½ to 1½ inches using 2 to 2 ½ tons of mulch per acre.

D. Immediately after spreading, anchor mulch using a mulch tiller consisting of a series of dull flat discs with notched edges or other approved equipment.

E. Anchor mulch to a depth of approximately 1½ to 2½ inches in the soil.

3.05 WATERING

A. Follow seed supplier's recommendations.

B. Water supplied at Contractor's expense.

END OF SECTION