SECTION 02070 - SELECTIVE DEMOLITION

PART 1 - GENERAL

RELATED DOCUMENTS:

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

DESCRIPTION OF WORK:

Extent of selective demolition work is indicated on drawings or noted in the specification.

Types of Selective Demolition Work: Demolition requires the selective removal and subsequent offsite disposal of the following:

Portions of building structure indicated on drawings and as required to accommodate new construction.

Removal of doors, windows and frames as indicated on drawings and as required to accommodate new construction.

Removal of concrete sidewalks and roof overhangs as required to accommodate new construction.

Removal of exterior walls and window elements as indicated on drawings and as required to accommodate new construction.

Removal of interior finishes adjacent to demolition to the extent of nearest "natural break" (i.e. floor tile, material seams, room corners, doorways, etc.) which allow for installation of new finishes.

Temporarily pipe away downspout drainage leaders away from new construction area.

Removal work specified elsewhere:

Cutting non-structural concrete floors and masonry walls for underground piping and ducts, and for above grade piping, ducts, and conduit is included with the work of the respective mechanical and electrical Divisions 15 and 16 specification sections.

Related work specified elsewhere:

Relocation of pipes, conduits, ducts, other mechanical and electrical work are specified by respective trades on the construction drawings.

SUBMITTALS:

Schedule: Submit schedule indicating proposed methods and sequence of operations for selective demolition work to Owner's Representative for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.

Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

JOB CONDITIONS:

Occupancy: Owner will be continuously occupying areas of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities which will severely impact Owner's normal operations. See Division 1 for other related scheduling requirements and restrictions.

Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.

Conditions existing at time of commencement of contract will be maintained by Owner insofar as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.

Partial Demolition and Removal: Items indicated to be removed but of salvable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.

Storage or sale of removed items on site will not be permitted.

The Owner shall be allowed to review any demolished, salvageable equipment or articles and remove such items to their storage facility prior to the contractor's disposal.

Protections: Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.

Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of building.

Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished, and adjacent facilities or work to remain.

Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.

Protect floors with suitable coverings when necessary.

Construct temporary insulated solid dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks if required.

Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces, and installation of new construction to insure that no water leakage or damage occurs to structure or interior areas of existing building.

Protect the roof membrane adjacent to demolition work performed on the roof from damage. Use only roof installers that can maintain existing warranties on the existing roof modifications.

Provide security measures suitable to the Owner to protect against unauthorized entry into building during unoccupied or unmanned times during construction. Coordinate with Owner's personnel to utilize building security system to protect building. Always secure renovation area against unauthorized use or entry by non construction personnel.

Remove protections at completion of work.

Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner.

Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

Explosives: Use of explosives is not permitted.

Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

Environmental Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

INSPECTION:

Prior to commencement of selective demolition work, inspect areas in which work will be performed. Photograph existing conditions to structure surfaces, equipment or to surrounding properties which could be misconstrued as damage resulting from selective demolition work; file with Owner's Representative prior to starting work.

PREPARATION:

Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse of structures to be demolished and adjacent facilities to remain.

Cease operations and notify the Owner's Representative immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

Cease operations and notify the Owner's Representative if hazardous materials are encountered or suspected.

Cover and protect furniture, equipment and fixtures to remain from soiling or damage when demolition work is performed in rooms or areas from which such items have not been removed.

Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.

Where selective demolition occurs immediately adjacent to occupied portions of the building, construct dust-proof partitions of minimum 4" studs, 5/8" drywall (joints taped) on occupied side, 1/2" fire-retardant plywood on demolition side, and fill partition cavity with sound-deadening insulation.

Provide weatherproof closures for exterior openings resulting from demolition work.

Locate, identify, stub off and disconnect utility services that are not indicated to remain.

Provide by-pass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shut-down of service is necessary during change-over.

DEMOLITION:

Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.

Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.

Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors or framing.

Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

Demolish foundation walls to a depth of not less than 12" below existing ground surface. Demolish and remove below-grade wood or metal construction. Break up below-grade concrete slabs.

For interior slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.

Completely fill below-grade areas and voids resulting from demolition work. Provide fill consisting of approved earth, gravel or sand, free of trash and debris, stones over 6" diameter, roots or other organic matter.

If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Architect in written, accurate detail. Pending receipt of directive from Architect of Owner's decisions, rearrange selective demolition schedule as necessary to continue overall job progress without delay.

SALVAGE MATERIALS:

Salvage Items: Where indicated on Drawings as "Salvage-Deliver to Owner," carefully remove indicated items, clean, store and turn over to Owner and obtain receipt.

Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance remain the property of the Owner. Notify Owner's Representative if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

Remove with care the white marble date stones built into the side exterior masonry wall. Reset the date stone into the new masonry wall where indicated by the new front door entrance.

Remove and reposition the existing steeple with lightning protection cables

DISPOSAL OF DEMOLISHED MATERIALS:

Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.

If hazardous materials are encountered during demolition operations, notify Architct immediately and comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.

Burning of removed materials is not permitted on project site.

CLEAN-UP AND REPAIR:

Upon completion of demolition work, remove tools, equipment and demolished materials from site. Remove protections and leave interior areas broom clean.

Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02070

SECTION 02110 - SITE CLEARING

PART 1 - GENERAL

RELATED DOCUMENTS:

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

DESCRIPTION OF WORK:

Extent of site clearing is shown on drawings.

Site clearing includes, but is not limited to:

- Protection of existing trees and site features.
- Removal of trees and other vegetation scheduled to be removed.
- Removal of paving and sidewalks.
- Topsoil stripping.
- Clearing and grubbing.
- Removing above-grade improvements.
  - Sidewalks and paving
- Removing below-grade improvements.
  - Buried utilities.

JOB CONDITIONS:

Traffic: Conduct site clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.

Protect improvements on adjoining properties and on Owner's property.

Protection of Existing Trees and Vegetation: Protect existing trees scheduled to remain:

- Outside the area 20'-0"± of the new building dimensions.
- 6'-0"± of curb lines around parking areas.
- Where final grade lines is within 6" of the existing grade line (and can be held the same with minor adjustments during construction).
- Indicated to remain in place.

Protect against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing.

Protection of Existing Site Features: Protect the following with barricades, fences, or other necessary measures to insure that they remain undisturbed:

- Existing asphalt parking lot paving scheduled to remain.
- Existing Concrete sidewalks scheduled to remain.
- Existing adjacent buildings and structures scheduled to remain.

PART 2 - PRODUCTS (Not applicable to work of this section.)

PART 3 - EXECUTION

SITE CLEARING:

General: Remove trees, shrubs, grass and other vegetation, improvements, or obstructions interfering with installation of new construction. Remove such items elsewhere on site or premises as specifically indicated. **Removal includes digging out stumps and roots**.

Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction.

Topsoil: Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4". Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2" in diameter, and without weeds, roots, and other objectionable material.

Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.

Remove heavy growths of grass from areas before stripping.

Where trees are indicated to be left standing, stop topsoil stripping a sufficient distance to prevent damage to main root system.

Stockpile topsoil in storage piles in areas shown, or where directed. Construct storage piles to freely drain surface water.

Dispose of unsuitable or excess topsoil same as waste material, herein specified.

Clearing and Grubbing: Clear site of trees, shrubs and other vegetation, except for those indicated to be left standing.

Completely remove stumps, roots, and other debris protruding through ground surface.

Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

Place fill material in horizontal layers not exceeding 6" loose depth, and thoroughly compact to a density equal to adjacent original ground.

Removal of Improvements: Remove existing above-grade and below-grade improvements necessary to permit construction, and other work as indicated (See other Division 1 section).

DISPOSAL OF WASTE MATERIALS:

Burning not permitted on Owner's Property:

Removal from Owner's Property: Remove waste materials and unsuitable and excess topsoil from Owner's property and dispose of off site in a legal manner.

END OF SECTION 02110

SECTION 02200 - EARTHWORK

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

SUMMARY

This Section includes the following:

Providing suitable structural fill soil from offsite or removal of soil offsite as necessary to create level building pad or other final gradelines as indicated on drawings.

Preparing of subgrade for building slabs, walks, and pavements.

Drainage fill course for support of building slabs is included as part of this work.

Excavating and backfilling of trenches within building lines for piping, foundations, footings, etc.

Excavating and Backfilling for Mechanical/Electrical Work: Refer to Divisions 15 and 16 sections for excavation and backfill required in conjunction with underground mechanical and electrical utilities and buried mechanical and electrical appurtenances.

Final Grading, together with placement and preparation of topsoil for lawns, is specified in Division 2 Section, "Landscape Work."

DEFINITIONS

Excavation consists of removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed.

Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be at Contractor's expense.

Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Architect.

In locations other than those above, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Architect.

Additional Excavation: When excavation has reached required subgrade elevations, notify Geotechnical Engineer, who will make an inspection of conditions. If Geotechnical Engineer determines that bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated material as directed by Geotechnical Engineer. **Notify the Architect immediately** of any additional excavation subject to additional cost to the Owner.

Architect's Construction Administrator must review Geotechnical Engineer's recommendations prior to any excavation occurring. The Contract Sum may be adjusted by an appropriate Contract Modification.

PLEASE NOTE: Undercut and Fill Allowance: Architect's approval must be obtained prior to proceeding with undercut and fill work. Field measurements of undercut areas will be verified by the Architect's representative. Payment from Undercut and Fill Allowance will be based on the measured hole size after the removal of unsuitable soils. Truck volume counts will not be an approved method for quantifying undercut and fill.

Removal of unsuitable material and its replacement as directed will be paid on basis of Conditions of the Contract relative to changes in work.

Subgrade: The undisturbed earth or the compacted soil layer immediately below granular sub base and/or base, drainage fill, or topsoil materials.

Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.

SUBMITTALS

Test Reports: Submit the following reports directly and promptly to Architect from the testing services, with copy to Contractor:

Test reports on borrow material **(included in the contractor's base bid costs)**.

Proof roll observation of building pad and parking areas **(to be paid by testing allowance)**

Verification of suitability of each footing subgrade material, in accordance with specified requirements **(to be paid by testing allowance)**.

Field reports; in-place soil density tests **(to be paid by testing allowance).**

Test reports required for the removal of unsuitable material and additional verification of subgrade material below intended excavation lines. **(to be paid by testing allowance)**.

QUALITY ASSURANCE

Codes and Standards: Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.

Testing and Inspection Service: **The Contractor** will employ and pay (by testing allowance) for a qualified independent geotechnical testing and inspection laboratory **approved by the Owner** to perform soil testing and inspection service during earthwork operations. Contractor will coordinate scheduling and pay approved invoices. Should unsuitable soil be found at the footing or building pad excavation depth, additional Geotechnical testing will be paid on basis of Conditions of the contract relative to changes in work.

PROJECT CONDITIONS

Site Information: Data in subsurface investigation reports was used for the basis of the design and are available to the Contractor for information only. Conditions are not intended as representations or warranties of accuracy or continuity between soil borings. The Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor. Copies of this report are available for use in the Office of the Architect and at the office of the Owner.

NO soil boring investigations or report is available for this project.

Additional test borings and other exploratory operations may be performed by Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such additional exploration.

Existing Utilities: Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.

Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

Use of Explosives: Do not bring explosives onto site or use in work.

Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.

Operate warning lights as recommended by authorities having jurisdiction.

Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

Perform excavation by hand within drip line of large trees to remain. Protect root systems from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap.

PART 2 - PRODUCTS

SOIL MATERIALS

General: Provide borrow soil materials when sufficient satisfactory soil materials are not available due to quantities required by contour requirements.

Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups that are clean subsoil free from debris, roots, topsoil, frozen material, and rock larger than 1/3 cu. ft. **that can be compacted to the densities herein specified, under the conditions defined.**

Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups that are not capable of being compacted to the densities required or rock material larger than 1/3 cu. Ft. debris or consisting of debris or organic material.

Top soil: Fertile, friable, , natural soil of loamy character, free of clay clumps, stones in excess of 4” in greatest dimension, typical of project vicinity and containing no harmful chemicalsor toxins harmful to plant growth.

Base Material/Structural fill: Naturally or artificially graded mixture of natural or crushed granite gravel, crushed stone, crushed slag, and natural or crushed sand.

Drainage Fill: Washed, evenly graded mixture of crushed granite stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 4 sieve.

Uses: Typical under floor slabs
Typical around foundation drains
Typical backfill for Retaining walls

Backfill and Fill Materials: Satisfactory soil materials free of clay, rock or gravel larger than 4 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter. See drawing and subsurface investigation report for acceptable fill materials.

PART 3 - EXECUTION

EXCAVATION:

Excavation Classifications: The following classifications of excavation will be made when rock is encountered:

Earth Excavation includes excavation of pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.

Rock excavation for trenches and pits includes removal and disposal of materials and obstructions encountered that cannot be excavated with a track-mounted power excavator, equivalent to Caterpillar Model No. 215C LC, and rated at not less than 115 HP flywheel power and 32,000-pound drawbar pull and equipped with a short stick and a 42-inch wide, short tip radius rock bucket rated at 0.81 cubic yard (heaped) capacity. Trenches in excess of 10 feet in width and pits in excess of 30 feet in either length or width are classified as open excavation.

Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered that cannot be dislodged and excavated with a modern, track-mounted, heavy-duty excavating equipment without drilling, blasting, or ripping. Rock excavation equipment is defined as Caterpillar Model No. 973 or equivalent track-mounted loader, rated at not less than 210 HP flywheel power and developing minimum of 45,000-pound breakout force (measured in accordance with SAE J732).

Typical of materials classified as rock are boulders 1/2 cu. yd. or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits.

Intermittent drilling, blasting, or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.

Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by geotechnical engineer. Such excavation will be paid on basis of Contract Conditions relative to changes in work and based on unit costs and volumes determined by geotechnical engineer and approved architect/owner.

Rock payment lines are limited to the following:

Two feet outside of concrete work for which forms are required, except footing.

One foot outside perimeter of footings.

In pipe trenches, 6 inches below invert elevation of pipe and 2 feet wider than inside diameter of pipe, but not less than 3 feet minimum trench width.

Outside dimensions of concrete work where no forms are required.

Under slabs on grade, 6 inches below bottom of concrete slab.

Additional Excavation: When excavation has reached required subgrade elevations, notify Architect/Engineer who will make an inspection of conditions.

If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Architect/Engineer.

Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.

Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

Dispose of excess soil material and waste materials legally off site.

Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room.

Except as otherwise indicated, excavate for exterior water bearing piping (water, steam, condensate, drainage) so top of piping is not less than 2'-6" below finished grade.

Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

STABILITY OF EXCAVATIONS

General: Comply with local codes, ordinances, and requirements of agencies having jurisdiction.

Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.

DEWATERING

Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.

Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

STORAGE OF EXCAVATED MATERIALS

Stockpile excavated materials acceptable for backfill and fill where directed. Place, grade, and shape stockpiles for proper drainage.

Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.

Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill.

EXCAVATION FOR STRUCTURES

Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot.

Excavations for footings and foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.

EXCAVATION FOR PAVEMENTS

Cut surface under pavements to comply with cross-sections, elevations and grades as indicated.

TRENCH EXCAVATION FOR PIPES AND CONDUIT

Excavate trenches to uniform width, sufficiently wide to provide ample working room and a minimum of 6 to 9 inches of clearance on both sides of pipe or conduit.

Excavate trenches and conduit to depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil.

COLD WEATHER PROTECTION

Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

BACKFILL AND FILL

General: Place soil material in layers to required subgrade elevations, for each area classification listed below, using materials specified in Part 2 of this Section.

Under grassed areas, use satisfactory excavated or borrow material.

Under walks and pavements, use base material, satisfactory excavated or borrow material, or a combination.

Under steps, use base material.

Under building slabs, use drainage fill material.

Under piping and conduit and equipment, use base materials where required over rock bearing surface and for correction of unauthorized excavation. Shape excavation bottom to fit bottom 90 degrees of cylinder.

Do not backfill trenches until tests and inspections have been made and backfilling is authorized by Architect. Use care in backfilling to avoid damage or displacement of pipe systems.

Provide 4-inch-thick concrete base slab support for piping or conduit less than 2'-6" below surface of roadways. After installation and testing of piping or conduit, provide minimum 4-inch-thick encasement (sides and top) of concrete prior to backfilling or placement of roadway base.

Backfill excavations as promptly as work permits, but not until completion of the following:

Acceptance of construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.

Inspection, testing, approval, and recording locations of underground utilities have been performed and recorded.

Removal of concrete formwork.

Removal of trash and debris from excavation.

Removal of permanent or temporary horizontal bracing in place on horizontally supported walls.

PLACEMENT AND COMPACTION

Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.

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 tampers.

Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

Place backfill and fill materials evenly adjacent to structures, piping, or conduit to required elevations. Prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift.

Control soil and fill compaction, providing minimum percentage of density specified for each area classification indicated below. Correct improperly compacted areas or lifts as directed by Architect if soil density tests indicate inadequate compaction.

Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of standard proctor maximum dry density, in accordance with ASTM D 698:

Under structures, building slabs and steps, and pavements, compact subgrade and each layer of backfill or fill material at 95 percent maximum density. Compact the upper 24 inches of subgrade to 98 percent maximum dry density.

Under lawn or unpaved areas, compact top 6 inches of subgrade and each layer of backfill or fill material at 93 percent maximum density.

Under walkways, compact top 6 inches of subgrade and each layer of backfill or fill material at 98 percent maximum density.

Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.

Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

Stockpile or spread soil material that has been removed because it is too wet to permit compaction. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.

GRADING

Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes and as follows:

Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.

Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10 foot above or below required subgrade elevation.

Pavements: Shape surface areas under pavement to line, grade, and cross-section, with finish surface not more than 1/2 inch above or below required subgrade elevation.

Grading Surface of Fill Under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2 inch when tested with a 10-foot straightedge.

Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

PAVEMENT BASE COURSE

General: Base course consists of placing base material, in layers of specified thickness, over subgrade surface to support a pavement base and/or surface course.

Refer to other Division 2 sections for paving specifications.

Grade Control: During construction, maintain lines and grades including crown and cross-slope of base course.

Shoulders: Place shoulders along edges of base course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each base course layer. Compact and roll at least a 12-inch width of shoulder simultaneous with the compaction and rolling of each layer of base course.

Placing: Place base course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting base material during placement operations.

When a compacted base course is indicated to be 6 inches thick or less, place material in a single layer. When indicated to be more than 6 inches thick, place material in equal layers, except no single layer more than 6 inches or less than 3 inches in thickness when compacted.

Typical paved area base course thickness shall be 6" under Light or Standard Duty Asphalt paving. and 8" under Heavy Duty Paving and concrete dumpster pad and apron.

BUILDING SLAB DRAINAGE COURSE

General: Drainage course consists of placement of drainage fill material, in 4" thick layers of indicated thickness, over subgrade surface to support concrete building and sidewalk slabs.

Placing: Place drainage fill material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting material during placement operations.

When a compacted drainage course is shown to be 6" thick or less, place material in a single layer. When shown to be more than 6' thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

FIELD QUALITY CONTROL

Quality Control Testing During Construction: **Contractor** shall provide all soil testing necessary to insure that compacted soils and subgrades meets specified standards and in no case shall these tests be less than the following schedule. **(Costs paid thru the testing allowance.)** Allow testing service to inspect and approve each subgrade and fill layer before further backfill or construction work is performed.

Perform field density tests in accordance with ASTM D 1556 (sand cone method).

Footing Subgrade: **For each strata of soil** on which footings will be placed, **perform at least one test every 100 feet of perimeter but no less than three location tests** to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata when acceptable to Architect/Soils Engineer.

Paved Areas and Building Slab Subgrade: Perform at least one field density test of subgrade for every 5,000 sq. ft. of paved area or every 3,000 sq. ft. of building slab, but in no case fewer that three tests. In each compacted fill layer, perform one field density test for every 2,000 sq. ft. of overlaying building slab or paved area, but in no case fewer than three tests.

Foundation wall Backfill: Take at least 2 field density tests, at locations and elevations directed.

If in opinion of Architect, based on testing service reports and inspection, subgrade or fills that have been placed are below specified density, perform additional compaction and testing until specified density is obtained, the cost of this retesting shall be paid as part of the contractor's project costs.

EROSION CONTROL

Provide erosion control methods in accordance with requirements of authorities having jurisdiction and requirements indicated in the drawings.

MAINTENANCE

Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

DISPOSAL OF EXCESS AND WASTE MATERIALS

Removal from Owner's Property: Remove waste materials, including unacceptable excavated material, trash, and debris, and dispose of it off Owner's property.

END OF SECTION 02200

SECTION 02282 - TERMITE CONTROL

PART 1 - GENERAL

RELATED DOCUMENTS

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

SUMMARY

Provide soil treatment for termite control, as herein specified.

Limits of termite treatment are as follows:

Under new concrete floor slab areas on grade or fill and along interior sides of foundation walls and grade beams and exterior sides of walls that abut permanent concrete or asphalt surfacing.

SUBMITTALS

Product Data: Submit manufacturer's technical data and application instructions.

QUALITY ASSURANCE

In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work, including preparation of substrate and application.

Engage a professional pest control operator, state licensed in accordance with regulations of governing authorities for application of soil treatment solution.

Use only termiticides, which bear a Federal registration number of the U.S. Environmental Protection Agency.

Provide termiticide approved and acceptable for use in Forsyth County, North Carolina.

JOB CONDITIONS

Restrictions: Do not apply soil treatment solution until excavating, filling and grading operations are completed, except as otherwise required in construction operations.

To insure penetration, do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.

SPECIFIC PRODUCT WARRANTY

Furnish written warranty certifying that applied soil termiticide treatment will prevent infestation of subterranean termites and, that if subterranean termite activity is discovered during warranty period, Contractor will re-treat soil and repair or replace damage caused by termite infestation.

Provide warranty for a period of 5 years from date of treatment, signed by Applicator and Contractor.

PART 2 - PRODUCTS

SOIL TREATMENT SOLUTION

Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.

PART 3 - EXECUTION

APPLICATION

Surface Preparation: Remove foreign matter, which could decrease effectiveness of treatment on areas to be treated. Loosen, rake and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placement of compacted fill under slabs, if recommended by toxicant manufacturer.

Application Rates: Apply soil treatment solution as follows:

Under slab-on-grade structures, treat soil before concrete slabs are placed, using the following rates of application:

Apply 2 gallons of chemical solution per 10 lin. ft. to soil in critical areas under slab, including entire inside perimeter inside of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers.

Apply one gallon of chemical solution per 10 sq. ft. as an overall treatment under slab and attached slab areas where fill is soil or unwashed gravel. Apply 1-1/2 gallons of chemical solution to areas where fill is washed gravel or other coarse absorbent material.

Apply 4 gallons of chemical solution per 10 lin. ft. of trench, for each foot of depth from grade to footing, along outside edge of building. Dig a trench 6" to 8" wide along outside of foundation to a depth of not less than 12". Punch holes to top of footing at not more than 12" o.c. and apply chemical solution. Mix chemical solution with the soil as it is being replaced in trench.

Under crawl space and basement structures, treat soil along exterior and interior walls of foundations with shallow footings as specified above for exterior of slab-on-grade structures.

Treat soil under or around appendage structures as follows:

Apply 4 gallons of chemical solution per 10 lin. ft. of trench along inside of foundation walls, along both sides of interior partitions, and around piers and plumbing. Do not apply an overall treatment in crawl spaces.

Apply 4 gallons of chemical solution per 10 lin. ft. of trench, for each foot of depth from grade to footing, along outside of foundation walls, including part beneath entrance platform porches, etc.

Apply 4 gallons of chemical solution per 10 lin. ft. along the inside and outside of foundation walls of porches.

Apply one gallon per 10 sq. ft. of soil surface as an overall treatment, only where attached concrete platform and porches are on fill or ground.

At hollow masonry foundations or grade beams, treat voids at rate of 2 gal. per 10 lin. ft., poured directly into the hollow spaces.

At expansion joints, control joints, and areas where slabs will be penetrated, apply at rate of 4 gals. per 10 lin. ft. of penetration.

Post signs in areas of application to warn workers that soil termiticide treatment has been applied. Remove signs when areas are covered by other construction.

Reapply soil treatment solution to areas disturbed by subsequent excavation, landscape grading, or other construction activities following application.

END OF SECTION 02282

SECTION 02514 - PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work specified in this section.

DESCRIPTION OF WORK:

Extent of portland cement concrete paving is shown on drawings, including service drives,concrete dumpster pad aprons, concrete curbs and walkways.

See new sidewalks and raised ramp surfaces in the drawings.

Prepared subbase is specified in "Earthwork" section.

Concrete and related materials are specified in Division 3.

Joint fillers and sealers are specified in Division 7.

QUALITY ASSURANCE:

Codes and Standards: Comply with local governing regulations if more stringent than herein specified.

JOB CONDITIONS:

Existing driveway must remain open for Church use as well as contractors use.

Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

Utilize flagmen, barricades, warning signs and warning lights as required.

PART 2 - PRODUCTS

MATERIALS:

Forms - General: Coat forms with a non-staining form release agent that will not discolor or deface surface of concrete.

Sidewalks: Steel or wood of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.

Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A 185.

Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 40.

Concrete Materials: Comply with requirements of applicable Division 3 sections for concrete materials, admixtures, bonding materials, curing materials, and others as required.

Expansion Joint Materials: Comply with requirements of applicable Division 7 sections for preformed expansion joint fillers and sealers.

Liquid-Membrane Forming Curing Compound: Complying with ASTM C 309, Type I, Class A unless other type acceptable to Architect. Moisture loss not more than 0.55 gr./sq. cm. when applied at 200 sq. ft./gal.

Available Products: Subject to compliance with requirements, products, which may be incorporated in the work, include, but are not limited to, the following:

"Masterseal"; Master Builders.
"Ecocure"; Euclid Chemical Co.
"Clear Seal"; A.C. Horn.
"Sure Cure"; Kaufman Products Inc.
"Kure-N-Seal"; Sonneborn-Contech.
"Klearseal"; Seton Industries.

CONCRETE MIX, DESIGN AND TESTING:

Comply with requirements of applicable Division 3 sections for concrete mix design, sampling and testing, and quality control, and as herein specified.

Design mix to produce standard-weight concrete consisting of portland cement, aggregate, water-reducing or high-range water-reducing admixture (super-plasticizer), air-entraining admixture and water to produce the following properties:

Compressive Strength: 3000 psi, minimum at 28 days, unless otherwise indicated.

Slump Range: 8" for concrete containing HRWR admixture (super-plasticizer); 3"-5" for other concrete.

Air Content: 5% to 8%.

PART 3 - EXECUTION

SURFACE PREPARATION:

Remove loose material from compacted subbase surface immediately before placing concrete.

FORM CONSTRUCTION:

Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.

REINFORCEMENT:

Locate, place and support reinforcement as specified in Division 3 sections, unless otherwise indicated.

CONCRETE PLACEMENT:

General: Comply with requirements of Division 3 sections for mixing and placing concrete, and as herein specified.

Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

Place concrete using methods, which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.

Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surface.

Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2-hour, place a construction joint.

JOINTS:

General: Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated.

Weakened-Plane (Contraction) Joints: Provide weakened- plane (contraction) joints, sectioning concrete into areas as shown on drawings. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, as follows:

Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.

Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for a period of more than 1/2-hour, except where such pours terminate at expansion joints.

Construct joints as shown or, if not shown, use standard metal keyway-section forms.

Expansion Joints: Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.

Locate expansion joints at 40' maximum for each walk and curb run, unless otherwise indicated.

Extend joint fillers full-width and depth of joint, and not less than 1/2" or more than 1" below finished surface. Fill within 1/8" of finish surface with joint sealer.

Fillers and Sealants: Comply with the requirements of applicable Division 7 sections for preparation of joints, materials, installation, and performance.

CONCRETE FINISHING:

After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.

After floating, test surface for trueness with a 10' straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.

Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2" radius, unless otherwise indicated. Eliminate tool marks on concrete surface.

After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:

Broom finish, by drawing a fine-hair broom across concrete surface, perpendicular to line of traffic. Repeat operation if required to provide a fine line texture acceptable to Architect.

On inclined slab surfaces, provide a coarse, non-slip finish by scoring surface with a stiff-bristled broom, perpendicular to line of traffic.

Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Architect.

CURING:

Protect and cure finished concrete paving, complying with applicable requirements of Division 3 sections. Use membrane-forming curing and sealing compound or approved moist-curing methods.

REPAIRS AND PROTECTIONS:

Repair or replace broken or defective concrete, as directed by Architect.

Sweep concrete walks and wash free of stains, discolorations, dirt and other foreign material just prior to final inspection.

END OF SECTION 02514

SECTION 02720 - STORM SEWER SYSTEM

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

SUMMARY

This Section includes storm sewerage system piping and appurtenances from connection to a point outside the building where it is discharged into the discharge area or retainage pond/erosion control drainage system.

Related Sections: The following sections contain requirements that relate to this section:

Division 2 Section "Earthwork" for excavation and backfill required for storm sewerage system piping and structures.

Division 4 Section "Masonry Work" for masonry materials used to construct drainage structures.

QUALITY ASSURANCE

Environmental Compliance: Comply with applicable portions of local environmental agency regulations pertaining to storm sewerage systems.

Utility Compliance: Comply with local utility regulations and standards pertaining to storm sewerage systems.

PROJECT CONDITIONS

Site Information: Perform site survey, research public utility records, and verify existing utility locations. Verify that storm sewerage system piping may be installed in compliance with original design and referenced standards.

Locate existing storm sewerage system piping and structures that are to be abandoned, maintained, or closed.

SEQUENCING AND SCHEDULING

Coordinate with interior building storm drainage piping.

Coordinate with other utility work.

Install storm work at a point in the construction that load bearing construction traffic over storm drainage system will not adversely damage storm work.

PART 2 - PRODUCTS

MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include but are not limited to the following:

Cleanouts:

Ancon, Inc.
Smith (Jay R.) Mfg. Co.
Wade Div.; Tyler Pipe.
Zurn Industries, Inc.; Hydromechanics Div.

PIPE AND FITTINGS

General: Provide pipe and pipe fitting materials compatible with each other. Where more than one type of materials or products is indicated, selection is Installer's option.

Polyvinyl Chloride (PVC) Sewer Pipe: ASTM D 3033, Type PSP, SDR 35; or ASTM D 3034, Type PSM, SDR 35.

Uses: Piping less-than or equal to 12" diameter located under grade **where noted on drawings as "PVC".**

Fittings: PVC, ASTM D 3033 or D 3034, solvent cement joints complying with ASTM D 2855 using solvent cement complying with ASTM D 2654; or elastomeric joints complying with ASTM D 3212 using elastomeric seals complying with ASTM F 477.

Provide Plenum rated PVC or HDPE storm piping where passing thru interior plenums spaces with unducted return air systems.

HDPE Storm Sewer Pipe: Double walled plastic pipe shall be HDPE N-12 smooth wall interior pipe as manufactured by Advanced Drainage Systems, Inc. or approved equal. The pipe shall meet the requirements os AASHTO M252, M294,and ASTM D 2412.

Uses: Where indicated on the plans As "**HDPE"** in sizes indiated.

Downspout roof leader boots: Provide transition boot to connect rectangular downspout to strorm drainage below grade. Provide a UV resistant PVC offset adapter transitioning from a 4"x6" rectangular downspout to a round diameter PVC drain pipeboot in sizes as required. Gutterworks Adapter or equal product.

Provide a UV resistant PVC adapter to connect the existing copper downspouts form the Sanctuary Copper roof into a new prefinished aluminum downspout leaders that connect at grade line to below grade storm drainage.

Hubless Cast-Iron Soil Pipe and Fittings: CISPI 301, gray cast iron, for coupling joints.

Reinforced Concrete Sewer Pipe (diameters greater than 12"): ASTM C 76, Class II, grouted joints.

CLEANOUTS

General: Provide cast-iron ferrule and countersunk brass cleanout plug, with round cast-iron access frame and heavy-duty, secured, scoriated cast-iron cover.

CATCH BASINS

Brick or Precast Concrete Catch Basins: See Site drawings for types and configurations of brick and mortar, of depth indicated. Wall thickness shall be 8 inches minimum, and inside diameter shall be 48 inches with tapered top for a 24-inch frame and grate, unless otherwise indicated. Thickness of section of wall deeper than 8 feet shall be 12 inches minimum.

Base, Channel, and Bench: Concrete.
Wall: ASTM C 32, Grade MS, manhole brick.
Mortar and Parging: ASTM C 270, Type S, using ASTM C 150, Type II Portland cement.

Catch Basin Frames and Grates: ASTM A 536 Grade 60-40-18, heavy-duty, ductile iron, shape and size detailed.

CONCRETE AND REINFORCEMENT

Concrete: Portland cement mix, 3,000 psi.

Cement: ASTM C 150, Type II.
Fine Aggregate: ASTM C 33, sand.
Coarse Aggregate: ASTM C 33, crushed gravel.
Water: Potable.

Reinforcement: Steel conforming to the following:

Fabric: ASTM A 185, welded wire fabric, plain.
Reinforcement Bars: ASTM A 615, Grade 60, deformed.

PART 3 - EXECUTION

PREPARATION OF FOUNDATION FOR BURIED STORM SEWERAGE SYSTEMS

Grade trench bottom to provide a smooth, firm, stable, and rock-free foundation, throughout the length of the pipe.

Remove unstable, soft, and unsuitable materials at the surface upon which pipes are to be laid, and backfill with clean sand or pea gravel to indicated level.

Shape bottom of trench to fit bottom of pipe. Fill unevenness with tamped sand backfill. Dig bell holes at each pipe joint to relieve the bells of all loads and to ensure continuous bearing of the pipe barrel on the foundation.

INSTALLATION, GENERAL

General Locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of the underground storm sewerage system piping. Location and arrangement of piping layout take into account many design considerations. Install the piping as indicated, to the extent practical.

Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and

couplings in accordance with manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.

Use manholes or catch basins for changes in direction, except where a fitting is indicated. Use fittings for branch connections, except where direct tap into existing sewer is indicated.

Use proper size increasers, reducers, and couplings, where different size or material of pipes and fittings are connected. Reduction of the size of piping in the direction of flow is prohibited.

Install piping pitched down in direction of flow, at minimum slope of 1 percent, except where indicated otherwise.

Extend storm sewerage system piping to connect to building storm drains, of sizes and in locations indicated.

PIPE AND TUBE JOINT CONSTRUCTION AND INSTALLATION

Join and install hubless cast-iron soil pipe and fittings with CISPI-type couplings in accordance with CISPI "Cast Iron Soil Pipe and Fittings Handbook, Volume I."

Join concrete pipe in accordance with applicable provisions of ACPC "Concrete Pipe Installation Manual" for grouted joints."

CLEANOUTS

Install cleanouts and extension from sewer pipe to cleanout at grade as indicated. Set cleanout frame and cover in concrete collar 18 by 18 by 12 inches deep. Set top of cleanout 1 inch above surrounding earth grade or flush with grade when installed in paving.

CATCH BASINS

Construct catch basins to sizes and shapes indicated.

Set frames and grates to elevations indicated.

TAP CONNECTIONS

Make connections to existing piping and underground structures so that finished work will conform as nearly as practicable to the requirements specified for new work.

Make branch connections from side into existing 4- to 21-inch piping by removing section of existing pipe and installing wye fitting into existing piping. Encase entire wye with not less than 6 inches of 3000-psi 28-day compressive-strength concrete.

Make branch connections from side into existing 24-inch or larger piping or to underground structures by cutting opening into existing unit sufficiently large to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall, unless otherwise indicated. On outside of pipe or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.

Provide concrete that will attain minimum 28-day compressive strength of 3000 psi, unless otherwise indicated.

Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris, concrete, or other extraneous material that may accumulate.

FIELD QUALITY CONTROL

Testing: Perform testing of completed piping in accordance with local authorities having jurisdiction.

Cleaning: Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.

In large, accessible piping, brushes and brooms may be used for cleaning.
Place plugs in ends of uncompleted pipe at end of day or whenever work stops.
Flush piping between manholes, if required by local authority, to remove collected debris.

Interior Inspection: Inspect piping to determine whether line displacement or other damage has occurred.

Make inspections after pipe between manholes and manhole locations has been installed and approximately 2 feet of backfill is in place, and again at completion of project.

If inspection indicates poor alignment, debris, displaced pipe, infiltration, or other defects, correct such defects and reinspect.

END OF SECTION 02720

SECTION 02900 - LANDSCAPE WORK

PART 1 - GENERAL

RELATED DOCUMENTS:

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

DESCRIPTION OF WORK:

Extent of landscape development work is shown on site drawings and in schedules. **Note that all areas disturbed during construction shall be grassed prior to substantial completion if not scheduled to be landscaped with sod, planter beds or isolated trees and scrubs locations**.

NOTE: Finish grading, disturbed lawnwork regrassing is by the GC. The Owner will install any nursery plants with their own forces.

Subgrade Elevations: Landscape Contractor to grade out existing soils and infill new suitable soils in planting areas. Final grade elevations to match existing conditions except as otherwise noted on drawings.

QUALITY ASSURANCE:

Source Quality Control:

General: Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.

Do not make substitutions. If specified landscape material is not obtainable, submit proposal to Owner for use of equivalent material.

Trees, Shrubs and Plants: Provide trees, shrubs and plants of quantity, size, genus, species and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock". Provide healthy, vigorous stock, grown in recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae and defects such as knots, sunscald, injuries, abrasions, or disfigurement. See planting schedule at the end of this section.

Label each tree and shrub with securely attached waterproof tag bearing legible designation of botanical and common name.

Formal arrangement and consecutive order of trees or shrubs is shown, select stock for uniform height and spread, to assure symmetry in planting. Owner may reject unsatisfactory planting material

DELIVERY, STORAGE AND HANDLING:

Packaged Materials: Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

Trees and Shrubs: Provide freshly dug trees and shrubs. Do not prune prior to delivery unless otherwise approved by Architect. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery. Do not drop balled and burlapped stock during delivery.

Deliver trees and shrubs after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist by covering with mulch, burlap or other acceptable means of retaining moisture.

Do not remove container grown stock from containers until planting time.

SPECIAL PROJECT WARRANTY:

Warranty trees and shrubs, for a period of one year after date of substantial completion, against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond Landscape Installer's control.

Remove and replace trees, shrubs, or other plants found to be dead or in unhealthy condition during warranty period. Make replacements during growth season following end of warranty period. Replace trees and shrubs, which are in doubtful condition at end of warranty period.

PART 2 - PRODUCTS

TOPSOIL:

Topsoil must be provided in planting beds of landscape work. Some top soil exists and may be reused if the required soil amendments are added. If quantity of stockpiled topsoil is insufficient, provide additional topsoil as required to complete landscape work.

Obtain topsoil from local sources or from areas having similar soil characteristics to that found at project site. Obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth of not less than 4"; do not obtain from bogs or marshes.

SOIL AMENDMENTS:

Lime: Natural limestone containing not less than 85% of total carbonates, ground so that not less than 90% passes a 10-mesh sieve and not less than 50% passes a 100-mesh sieve.

Peat Humus: FS Q-P-166 decomposed peat with no identifiable fibers and with ph range suitable for intended use.

Sand: Clean washed sand, free of toxic materials.

Bonemeal: Commercial, raw, finely ground; 4 percent nitrogen and 20 percent phosphoric acid.

Superphosphate: Soluble mixture of treated minerals; 20 percent available phosphoric acid.

Perlite: Conforming to National Bureau of Standards PS 23.

Vermicolite: Horticultural grade, free of toxic substances.

Manure: Well rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials and containing no chemicals or ingredients harmful to plants.

Mulch: Organic mulch free from deleterious materials and suitable for top dressing of trees, shrubs or plants and consisting of one of the following:

Pine Needle Mulch

Commercial Fertilizer: Complete slow release fertilizer of neutral character, with some elements derived from organic sources and containing following percentages of available plant nutrients:

For trees and shrubs, provide fertilizer with not less than 5% total nitrogen, 10% available phosphoric acid and 5% soluble potash. See also fertilizer specs on Landscape drawing sheets.

For lawns, provide fertilizer with percentage of nitrogen required to provide not less than 1 lb. of actual nitrogen per 100 sq. ft. of lawn area and not less than 4% phosphoric acid and 2% potassium. Provide nitrogen in a form that will be available to lawn during initial period of growth; at least 50% of nitrogen to be in organic form. See also fertilizer specs on Landscape drawing sheets.

PLANT MATERIALS:

Quality: Provide trees, shrubs, and other plants of size, genus, species, and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.l "American Standard for Nursery Stock."

Deciduous Trees: Provide trees of height and caliper scheduled or shown and with branching configuration recommended by ANSI Z60.1 for type and species required. Provide single stem trees except where special forms are shown or listed.

Provide balled and burlapped (B&B) deciduous trees, see schedule for height and calipher requirements.

Deciduous Shrubs: Provide shrubs of the height shown or listed and with not less than minimum number of canes required by ANSI Z60.1 for type and height of shrub required.

Container grown deciduous shrubs will be acceptable in lieu of balled and burlapped deciduous shrubs subject to specified limitations of ANSI Z60.1 for container grown stock.

Coniferous and Broadleafed Evergreens: Provide evergreens of sizes shown or listed. Dimensions indicate minimum spread for spreading an semi-spreading type evergreens and height for other types, such as globe, dwarf, cone, pyramidal, broad up-right, and columnar. Provide normal quality evergreens with well-balanced form complying with requirements for other size relationships to the primary dimension shown.

Container grown evergreens will be acceptable subject to specified limitations for container grown stock.

GRASS MATERIALS:

Grass Seed: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified at the end of this section.

GROUND COVER:

Provide plants established and well-rooted in removable containers or integral peat pots and with not less than minimum number and length of runners required by ANSI Z60.1 for the pot size shown or listed. See schedule at end of section.

MISCELLANEOUS LANDSCAPE MATERIALS:

Anti-Erosion Mulch: Provide clean, seed-free salt hay or threshed straw of wheat, rye, oats or barley.

Plastic Sheet: Weed block fabric, manufacturered by Agri-Tex, Inc. or equal. Product is made from woven polypropylene fabric and allows water, air, nutrients to penetrate.

Wrapping: Tree-wrap tape not less than 4" wide, designed to prevent bore damage and winter freezing.

Stakes and Guys: Provide stakes and deadmen of sound new hardwood, treated softwood, or redwood, free of knot holes and other defects. Provide wire ties and guys of 2-strand, twisted, pliable galvanized iron wire not lighter than 12 ga. with zinc-coated turnbuckles. Provide not less than 1/2" diameter rubber or plastic hose, cut to required lengths and of uniform color, material and size to protect tree trunks from damage by wires.

PART 3 - EXECUTION

PREPARATION:

PREPARATION OF PLANTING SOIL:

Mix specified soil amendments and fertilizers with topsoil at rates specified. Delay mixing of fertilizer if planting will not follow placing of planting soil within a few days. See schedule at end of section.

For planting beds and lawns, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.

Mix lime with dry soil at a rate of 90 lbs. per 1000 sq. ft prior to mixing of fertilizer.

Prevent lime from contacting roots of acid-loving plants.

Apply phosphoric acid fertilizer directly to subgrade before applying planting soil and filling.

PREPARATION FOR PLANTING LAWNS:

Preparation of Disturbed or Excavated Lawn: Where lawns are to be planted in areas that have been altered or disturbed by excavating, grading, or stripping operations, prepare soil for lawn planting as follows: Loosen to a depth of not less than 4"; apply soil amendments and initial fertilizers as specified; remove high areas and fill in depressions; till soil to a homogenous mixture of fine texture, free of lumps, clods, stones, roots and other extraneous matter.

Spread top soil to depth required to meet existing lines, grades after light rolling and natural settlement. Add specified soil amendments and mix thoroughly into upper 4 inches of topsoil. Allow for sod thickness in areas to be sodded.

Apply specified commercial fertilizer at rates specified by manufacturer and thoroughly mix into upper 2" of topsoil. Delay application of fertilizer if lawn planting will not follow within a few days.

Fine grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll, rake and drag lawn areas, remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas, which can be planted immediately after grading.

Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.

PREPARATION OF PLANTING BEDS:

Loosen subgrade of planting bed areas to a minimum depth of 6" using a cultimulcher or similar equipment. Remove stones over 1" in any dimension, and sticks, stones, rubbish and other extraneous matter. Add specified soils, soil amendments and fertilizers to upper 6-8" layer.

Where no suitable top soil exists remove 10" of soil and replace with prepared planting soil mixture enhanced with specified soil amendments and fertilizers.

Excavation for Trees and Shrubs:

Excavate pits, beds and trenches, with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Loosen hard subsoil in bottom of excavation.

For balled and burlapped (B&B trees and shrubs), make excavations at least half again as wide as the ball diameter and equal to the ball depth, plus following allowance for setting of ball on a layer of compacted backfill:

Allow for 6" setting layer of planting soil mixture.

For container grown stock, excavate as specified for balled and burlapped stock, adjusted to size of container width and depth.

Dispose of subsoil removed from planting excavations. Do not mix with planting soil or use as backfill.

Fill excavations for trees and shrubs with water and allow to percolate out before planting.

PLANTING:

Planting Trees and Shrubs:

Set balled and burlapped (B&B) stock on layer of compacted planting soil mixture, plumb and in center of pit or trench with top of ball at same elevation as adjacent finished landscape grades. Remove burlap from sides of balls; retain on bottoms. When set, place additional backfill around base and sides of ball, and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately 2/3-full, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill.

Set container grown stock as specified for balled and burlapped stock, except cut cans on 2 sides with an approved can cutter; remove bottoms of wooden boxes after partial backfilling so as not to damage root balls.

Dish top of backfill to allow for mulching.

Mulch pits, trenches and all planted areas. Provide not less than following thickness of mulch and work into top of backfill and finish level with adjacent finish grades.

Provide 3" thickness of mulch typ. For Lirope and Mondo grass beds provide 2” mulch.

Prune, thin out and shape trees and shrubs in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees, if any. Prune shrubs to retain natural character.

Wrap tree trunks of 2" caliper and larger. Start at ground and cover trunk to height of first branches and securely attach. Inspect tree trunks for injury, improper pruning and insect infestation and take corrective measures before wrapping.

Guy and stake trees immediately after planting, as indicated.

SEEDING NEW LAWNS:

Do not use wet seed or seed, which is moldy or otherwise, damaged in transit or storage.

Rake seed lightly into top 1/8" of soil, roll lightly, and water with a fine spray.

Protect seeded areas against erosion by spreading specified lawn mulch after completion of seeding operations. Spread uniformly to form a continuous blanket not less than 1-1/2" loose measurement over seeded areas.

Water newly planted areas and keep moist until new grass is well established.

Within 2 weeks of initial seeding, contractor to inspect grass stand. Replant areas that have sparce or no new growth.

PLANTING GROUND COVER:

Space ground cover plants as indicated or scheduled to fill the planting areas shown shaded on plans.

Space ground cover plants not more than 24 inches o.c.

Dig holes enough to allow for spreading of roots and backfill with planting soil. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water. Water thoroughly after planting, taking care not to cover crowns of plants with wet soils.

Mulch areas between ground cover plants; place not less than 2 inches thick.

MAINTENANCE:

Begin maintenance immediately after planting.

Maintain lawns by watering, fertilizing, weeding and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.

Mowing and triming shall be by Owner.

CLEANUP AND PROTECTION:

During landscape work, keep pavements clean and work area in an orderly condition.

INSPECTION AND ACCEPTANCE:

When landscape work is completed, (approximately 4 to 6 weeks later) Architect will, upon request, make an inspection to determine acceptablility.

Where inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by Architect and found to be acceptable. Remove rejected plants and materials promptly from project site.

SCHEDULE OF PLANTING SOIL MIXTURE REQUIREMENTS:

For lawn areas, provide not less than the following quantities of specified materials:

90 pounds of lime per 1000sf.

8 pounds fertilizer per 1000 sf (Scotts Proturf (20-26-6)

SCHEDULE OF GRASS SEED MIXTURES:

Seed all disturbed areas with Rebel II or Falcon fescue Grass (96% purity, 85% minimum germination). Seed shall be free of noxious weed seeds.

SCHEDULE OF PLANTING MATERIALS: (BY OWNER)

See Drawings for planting materials and quantities.

END OF SECTION 02900