1. **GENERAL**

   A. Related sections:
      
      i. 01 41 26.02 – Local Utility Information & Locate
      ii. 23 05 19 – Meters and Gages
      iii. 33 10 00 – Water Utilities – Public Water Distribution System
      iv. 33 12 13.13 – Water Supply Backflow Preventer Assemblies
      v. 33 30 00 – Sanitary Sewerage Utilities – Sanitary Sewer Collection Systems
      vi. 33 60 00 – Hydronic and Steam Energy Utilities
      vii. 33 71 19 – Electrical Underground Ducts & Manholes
      viii. 33 80 00 – Communications Utilities

   B. Accessible isolation valves, identified as to function, shall be provided at new taps from existing utilities.

   C. Provide detectable aluminum foil plastic backed tape or detectable magnetic plastic tape manufactured specifically for warning and identification of buried utility.

   D. Existing services and equipment shall be specified to be removed from site and not be abandoned in place except with the written approval of FMD.

   E. The Contractor shall adjust all existing and new utility structures (manholes, valve boxes, etc.) to meet new grades as required to complete this project at part of the Cost of the Work or Base Bid.

   F. The Engineer shall provide underground profile drawings of all utilities to be installed on campus (steam, chilled water electrical duct bank, sewer, storm, etc.) clearly indicating depths of existing underground utilities.

   G. Where utility excavation will be required, the Engineer shall specify “maximum limits of excavation” and shall calculate anticipated rock and unsuitable soil allowances. In addition, the engineer shall specify that the contractor provide “unit prices” for rock, and unsuitable soils.

   H. Design Professional shall provide spot elevations for hardscape and landscape elements as required to clearly illustrate storm water flow direction.

   I. Design Professional shall route all utilities to avoid the critical root zone of mature trees and landscapes. When absolutely necessary to enter the critical root zone of mature trees a licensed arborist must be consulted to determine the best course of action for attempting to preserve the tree.
1. GENERAL
   
   A. Related sections:
      i. 01 41 26.02 – Local Utility Information & Locate
33 12 13.13
WATER SUPPLY BACKFLOW PREVENTER ASSEMBLIES

1. GENERAL
   A. Related sections:
      i. 01 41 26.02 – Local Utility Information and Locate
   B. Building backflow preventers shall be designed and installed so that two backflow preventers are in parallel. This will allow for annual maintenance to occur without disruption of service.
1. **GENERAL**
   
   A. Related sections:
      i. 01 41 26.02 – Local Utility Information and Locate
   
   B. Prior to Material Completion, the Contractor shall camera all new sanitary sewer pipe installed exterior to the building perimeter, and 10 feet beyond the connection point with existing pipe. The Contractor shall provide the Design Professional and Project Manager with an electronic copy of the video footage for review. Cost of videoing the system shall be included in the Cost of the Work or Base Bid.
   
   C. Sanitary sewer piping shall be installed in a 6-inch minimum sand bed. Gravel is not acceptable.
   
   D. PVC is standard for slab sanitary sewerage lines.
1. GENERAL
   A. Related sections:
      i. 23 00 00 – General Mechanical Requirements
      ii. 23 21 13 – Hydronic Piping
      iii. 23 22 13 – Steam & Condensate Heating Piping
      iv. 33 00 00 – General Utilities Requirements
   B. Design Professional shall specify fiber reinforced polymer composite, traffic rated, secure locking lids for heavy electrical manhole covers. New cast iron covers will not be accepted.

2. PRODUCTS
   A. Vaults shall be cast-in-place, reinforced concrete construction and shall be waterproofed (top, bottom and sides) with a sheet membrane system that bonds to the concrete.
   B. Pipe penetrations shall be sleeved and the space between the piping outer jacket and the sleeve shall be sealed with link-seal, and the void filled with non-shrinking grout.
   C. Vaults shall be provided with sump pumps.
      i. Chilled water vault sumps shall be electric.
      ii. Steam vault sumps shall be steam-powered.
   D. Steam manhole cover.
      i. Cast iron construction with load rating appropriate for location.
      ii. Molded with “STEAM” inscription.
   E. Chilled Water manhole cover equal to Virtual Polymer Compounds, LLC (VPC) manhole cover with penta-socket bolt head lock(s).
      i. H-20 and AASHTO HS-25 load rating for 80,000 lb.
      ii. Self-containing locking system that provides cover to frame retention and security from unauthorized entry and uses a penta-socket bolt head.
      iii. Fiber reinforced polymer
      iv. Egress handle:
         a. Provide a manual pull handle for use by individual inside the manhole a means to exit
         b. All plastic construction to resist corrosion, parts molded in high visibility yellow
         c. Pulling the handle will latch open one of the cartridge assemblies and allow the person to push the cover out of the frame and then exit.
      v. Ultraviolet radiation will not affect long term performance of composite manhole cover.
      vi. Logo Plate: Stainless Steel plate 1/8-inch thick that as appropriate says “CHILLED WATER”.
      vii. All metallic hardware shall be 316 stainless steel.
3. **EXECUTION**
   A. Contractors shall coordinate with FMD Welding Shop (706-542-7593) before entering steam pits.
   B. Vaults sump pumps shall be piped to the nearest storm manhole.
33 71 19
ELECTRICAL UNDERGROUND DUCTS & MANHOLES

1. GENERAL
   A. Related sections:
      i. 26 00 00 – General Electrical Requirements
      ii. 33 00 00 – General Utilities Requirements
   B. Design Professional shall specify fiber reinforced polymer composite, traffic rated, secure locking lids for heavy electrical manhole covers. New cast iron covers will not be accepted.

2. PRODUCTS
   A. Electrical manhole / handhole cover equal to Virtual Polymer Compounds, LLC (VPC) manhole cover with penta-socket bolt head lock(s).
      i. H-20 and AASHTO HS-25 load rating for 80,000 lb.
      ii. Self-containing locking system that provides cover to frame retention and security from unauthorized entry and uses a penta-socket bolt head.
      iii. Fiber reinforced polymer.
      iv. Egress handle:
         a. Provide a manual pull handle for use by individual inside the manhole a means to exit.
         b. All plastic construction to resist corrosion, parts molded in high visibility yellow.
         c. Pulling the handle will latch open one of the cartridge assemblies and allow the person to push the cover out of the frame and then exit.
      v. Ultraviolet radiation will not affect long term performance of composite manhole cover.
      vi. Logo Plate: Stainless Steel plate 1/8-inch thick that as appropriate says “ELECTRIC” or “HIGH VOLTAGE”.
      vii. All metallic hardware shall be 316 stainless steel.
   B. Manhole / Handhole Cable Racking
      i. Underground Devices Incorporated “BNT Non-Metallic Cable Support” system with 316 stainless steel stanchion hardware, or approved equal.

3. EXECUTION/INSTALLATION
   A. All conduits entering/leaving manholes shall be straight for a minimum of 2’-0” (no bends) off of the exterior walls of the manhole / handhole, and there shall be no conduit elbows into or out of manholes / handholes.
   B. Leave a minimum of 1’-0” of conduit extending into manhole when using cored holes.
**GENERAL NOTES:**

1. 6" SCH 40 PVC CONDUITS ARE SPACED 9-3/4" O.C. PROVIDING 3" OF CONCRETE SEPARATION BETWEEN EACH ONE.

2. THIS DETAIL USES INTERLOCKING "CONEX" PART #: A330200 BASE SPACERS & PART #: A330201 INTERMEDIATE SPACERS WHICH SHALL BE SPACED 5"-0" O.C. HORIZONTALLY ALONG THE LENGTH OF THE DUCT BANK. IF OTHER CONDUIT SPACERS ARE SPECIFIED, ENSURE THEY COMPLY WITH GENERAL NOTE #1.

**KEY NOTES:**

1. PROVIDE & INSTALL (2) 1/2" #2 CARBON STEEL RE-BARS AT EACH SET OF SPACERS (5'-0" O.C.) TO PREVENT CONDUIT FLOATING WHILE CONCRETE IS POURED. ALLOW MINIMUM 1" TOTAL OVERLAP AT TOP CENTER AND MINE TIGHTLY TOGETHER. ROUTE DOWN AND THROUGH SPACER HOLES ON OPPOSITE SIDES OF SPACERS WITH MINIMUM ENHANCED ENHANCED OF 12". SOIL CONDITIONS MAY DECREASE DESIGN ENHANCEMENT. IF ROCK IS ENCOUNTERED, EMBED RE-BARS MINIMUM 12" INTO HONEYCOMB (DEPENDING ON SOIL CONDITIONS REQUIRED AT A MAXIMUM ANGLE OF 45 DEGREES OF EXCAVATION).

2. PROVIDE & INSTALL (10) 1/2" #2 CARBON STEEL RE-BARS LONGITUDINALLY AS DIMENSIONED IN DRAWING, AND AN RE-BAR LATERAL "BRACKETS" AT 16" O.C. LONGITUDINALLY FOR ANY DUCT BANK SECTIONS BEHIND ANY ROADS OR TRAFFIC-RAISED AREAS. EMBED STEEL REINFORCEMENT TO MINIMUM 10'-0" BEYOND ROAD SHOULDERS OR TRAFFIC RAISED AREAS. USE CHINS OR BRACKETS TO SUPPORT RE-BARS OFF OF SAND. THE "PULL-UP" OR "PUSH-DOWN" METHODS FOR POSITIONING RE-BARS AFTER CONCRETE IS POURED ARE NOT ALLOWED.

**TYPICAL 3x2, 6" O.D. CONDUIT PRIMARY CONCRETE DUCT BANK**

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**UGA DESIGN & CONSTRUCTION**
**SUPPLEMENTAL GENERAL REQUIREMENTS & STANDARDS**
**FEBRUARY 5, 2018**

**ELECTRICAL UNDERGROUND DUCTS & MANHOLES**

33 71 19-2
SCHEMATIC DRAWINGS FOR GENERAL REFERENCE ONLY

GENERAL MANHOLE DETAILS:

- Pulling iron in ceiling (typical)
- All bars #7 @ 10° OC
- Turn down #7 bar (typical)
- All single bars are straight

ROOF PLAN

- Pulling iron in floor (typical)
- All bars #4 @ 10° OC

PLAN BELOW ROOF
SCHEMATIC DRAWINGS FOR GENERAL REFERENCE ONLY

ELEVATION

SECTION A-A (TYPICAL 4 SIDES)

UGA DESIGN & CONSTRUCTION
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33 71 19-4

ELECTRICAL UNDERGROUND DUCTS & MANHOLES
SCHEMATIC DRAWINGS FOR GENERAL REFERENCE ONLY

DETAIL A - SUMP COVER

DETAIL B - CABLE RACKING

NOTE: FASTEN BY MEANS OF 2.5" X 0.5" BOLTS AND EXPANSION SHIELDS
1. GENERAL
   A. Related sections:
      i. 27 00 00 – General Communications Requirements
      ii. 27 05 43 – Underground Ducts & Raceways for Communications