Bid Addendum 01

CLARKNEXSEN

1523 Elizabeth Ave, Suite 300
Charlotte, NC 28204

Project: UNC Charlotte Science Building:
Early Package 1
Existing Building Heating Conversions

Date: November 20, 2017

COMM #: SCO ID #: 16-14335-02B
Code: 46626 Item: 301
Clark Nexsen #: 6222

Prepared by: Mike Romot, AIA, LEED BD+C

This ADDENDUM is to be a part of the contract documents and modifies and takes precedence over the original bid documents, as noted below and in any attached documents. Original items of the plans and specifications that have been modified, amended, voided or suspended through previous addendums, shall remain in effect. It is the responsibility of the Bidder to notify and/or distribute this ADDENDUM to those sub-bidders who have received prints or digital files. The Bidder is to acknowledge receipt of this ADDENDUM in the space provided on the Bid Form.

GENERAL INFORMATION

- All work associated with the Atkins Library Building, Kennedy Building and McMillian Greenhouse is removed from this bid package. The utilities crossing Craver Road, 5'-0" beyond the curb (both North and South) of Craver Road, is by others and is not a part of this contract. All chilled water piping is by others and is not a part of this contract.

DRAWING MODIFICATIONS

- Revise sheet GI001 TITLE SHEET as follows:
  - Under the "Scope Summary" chart remove these scope items:
    - 1. Atkins Library Building
    - 4. Kennedy Building
    - 6. McMillan Greenhouse

- Delete the following drawings sheets in their entirety from the drawing set and remove reference to them from the sheet index:
  - GI100 ATKINS LIBRARY CODE SUMMARY
  - GI400 KENNEDY CODE SUMMARY
  - GI600 MCMILLAN GREENHOUSE CODE SUMMARY
  - ME004 STEAM DIAGRAMS
  - ME008 CONTROLS
  - ME100 ATKINS MECHANICAL-ELECTRICAL PLANS
  - ME400 KENNEDY MECHANICAL-ELECTRICAL PLANS
  - ME600 MCMILLAN MECHANICAL-ELECTRICAL PLANS

- Replace the following sheets with the attached revised sheets:
  - o C-100 DEMO AND EROSION CONTROL PLAN
  - o C-200 LAYOUT PLAN
  - o C-300 GRADING PLANS
  - o C-400 UTILITY PLANS
  - o C-401 UTILITY DETAILS
  - o ME001 MECHANICAL LEGENDS AND NOTES
  - o ME006 ELECTRICAL SCHEDULES AND DETAILS
  - o ME200 CAMERON MECHANICAL ELECTRICAL PLANS
  - o MES01 MECHANICAL-ELECTRICAL SITE PLAN AND DETAILS

- Revise sheet ME003 as follows:
  - o Alter the Pump Schedule by deleting in their entirety, pumps P-5and P-6.
  - oAlter the Expansion Tank Schedule by deleting in its entirety, expansion tank ET-1
  - oAlter the Air Separator Schedule by deleting in its entirety, expansion tank AS-1
  - oAlter the pipe insulation thicknesses schedule so the thickness for steam piping 1-1/2 inch and greater is 3", not 2".
  - o Delete the following equipment schedules in their entirety:
    - Hot Water Unit Heater Schedule
    - Steam Unit Heater Schedule
    - Boiler Feedwater Assembly Schedule
    - Blowdown Separator Schedule
    - Steam Boiler Schedule
    - Natural Gas Condensing Type Boiler Schedule
    - Fan Schedule

- Revise sheet ME010 as follows:
  - o Add "General Notes" from Sheet ME011.
  - o Add "Controls Contractor Coordination" from Sheet ME011.

PROJECT MANUAL MODIFICATIONS

- Modify 000110 – Table of Contents as follows:
  - o 003126 Hazardous Materials - Delete the following reports:
    - NESHAP Asbestos Survey Report – Atkins Mechanical Rooms and Atkins Stacks.
    - NESHAP Asbestos Survey Report – Kennedy Mechanical Room, IT Services Offices, and Hallway Corridor.
    - NESHAP Asbestos Survey Report – McMillan Greenhouse Mechanical Room.
  - o 042200 Concrete Unit Masonry – Delete section.

- Modify 000115 – List of Drawing Sheets deleting drawings listed in the "Drawing Modifications" portion of this addendum.

- Delete the following specification sections:
  - o 000107 Seals Page: Delete unsigned page only.
  - o 042200 Concrete Unit Masonry
  - o 233423 HVAC Power Ventilators
  - o 235216 Condensing Boilers
  - o 235223 Steam Boiler Vertical Multiport
  - o 235223.13 Steam Boiler Vertical
  - o 238239.16 Propeller Unit Heaters

REQUEST FOR SUBSTITUTION or APPROVED EQUAL PRODUCT MANUFACTURERS
Manufacturers below, not previously listed in the Construction Documents, have been approved to participate in the project based on submitted data. Being added to the list of approved manufacturers does not relieve the manufacturer or their product(s) from meeting the minimal performance requirements set forth in the Bid Documents.

- No requests now.

QUESTIONS AND ANSWERS

1. **Hot Water Valves** (Drawing Sheet C-400): Provide specifications and details on hand holes for 10" heating hot water valves shown at the temporary boiler trailers.

   Response: The requirements for the below grade valves are described on drawing ME001. The drawings state to provide valves below grade with extensions and donut and valve box. Typical valve box detail has been added on drawing C-401.

2. **Heat Trace at Temporary Trailers** (Detail 3/MES01): Will heat tracing be needed for hot water piping above grade at temporary trailers locations? If so, please provide watts for heat tape.

   Response: Heat tracing is not required for the heating water pipe.

3. **Flushing** (Drawing Sheet ME001): With the method of flushing specified will this not cause the inner piping to corrode before set into service? On earlier projects, at UNCC, the mechanical contractor installed the piping system and hydro flushed then new piping system before connecting to existing systems.

   Response: Per UNCC personnel, flush system per UNCC Guidelines and per the drawings as described on drawing sheet ME001.

4. **HHWS/R Piping** (Detail. 1/MES01):

a. **Main Walkway**: Detail shows connecting new 10" HHWS/R piping, at 36" grade, to existing 6" HHWS/R that shows no grade.
b. **McEniry Connection**: Detail shows connecting new 6" HHWS/R piping, at a 36" grade, to existing 6" HHWS/R that shows no grade.
c. **Cameron Connection**: Detail shows connecting new 4" HHWS/R piping, at a 36" grade, to existing 6" HHWS/R that shows no grade. Please provide a detail of what type of connections required.
d. **Over Pipe Connection/ Under Pipe Connection**:
    i. Over Pipe Connection will require a vent.
    ii. Under pipe connection will require a drain.

    Response: The pipe connections will need to be field coordinated after the exact depth of the existing piping and any other existing utilities within close vicinity are identified. The preference is to use a over-pipe connection with an air vent in lieu of a under-pipe connection with a drain.

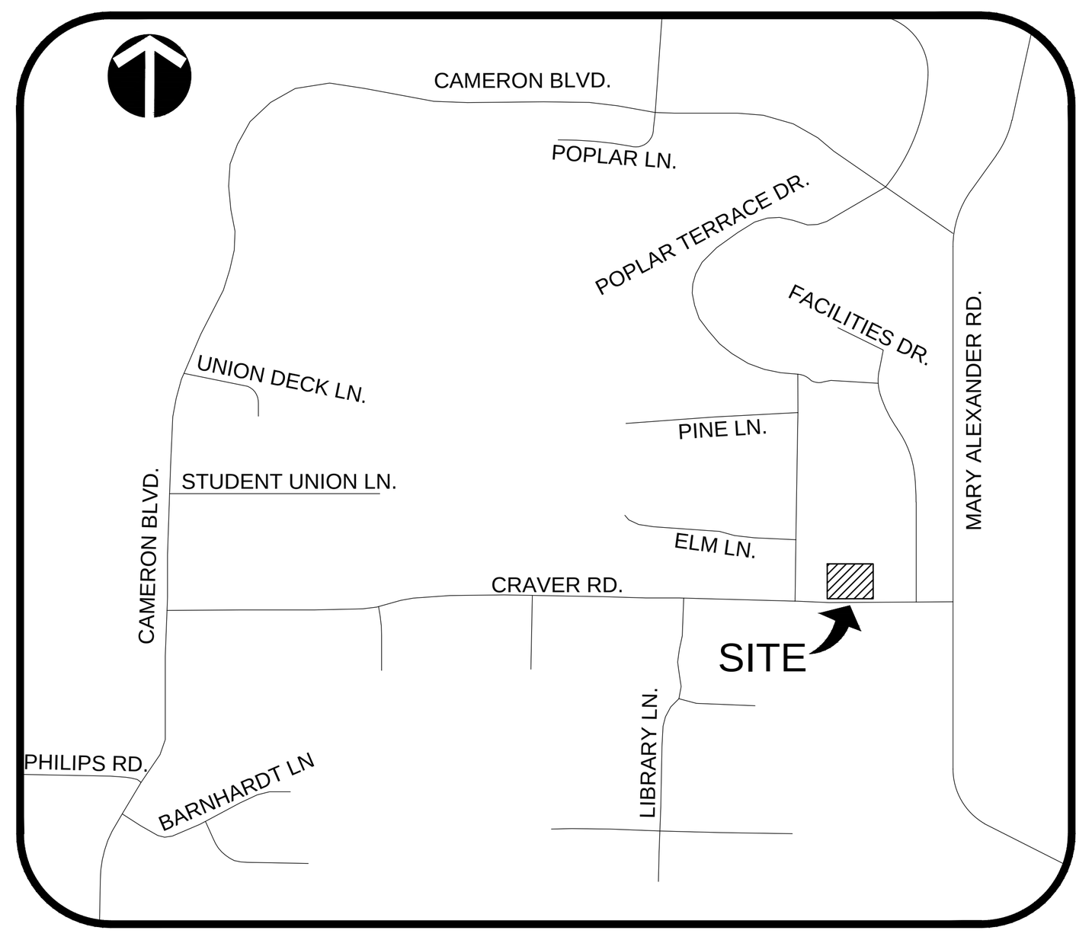
5. **A/C Unit** (Drawing Sheet C-050): Picture shows an outdoor A/C unit at location of new underground hot water piping to be installed. There is no mention of relocating this A/C unit. During the walk-thru there was mention of relocating the underground hot water piping. Provide information of what will be needed. Relocate A/C unit or relocate underground piping so subcontractors can estimate accordingly.

    Response: The underground piping enters Cameron in a storage room. There should be sufficient linear wall space to locate the pipes and not disturb the existing AC unit. The exact location of where the pipes shall enter the building will need to be coordinated during the construction phase of the project.

ATTACHMENTS

- C-100 DEMO AND EROSION CONTROL PLAN
- C-200 LAYOUT PLAN
- C-300 GRADING PLANS
- C-400 UTILITY PLANS
- C-401 UTILITY DETAILS
- ME001 MECHANICAL LEGENDS AND NOTES
- ME006 ELECTRICAL SCHEDULES AND DETAILS
- MES01 MECHANICAL-ELECTRICAL SITE PLAN AND DETAILS

END OF BID ADDENDA 01



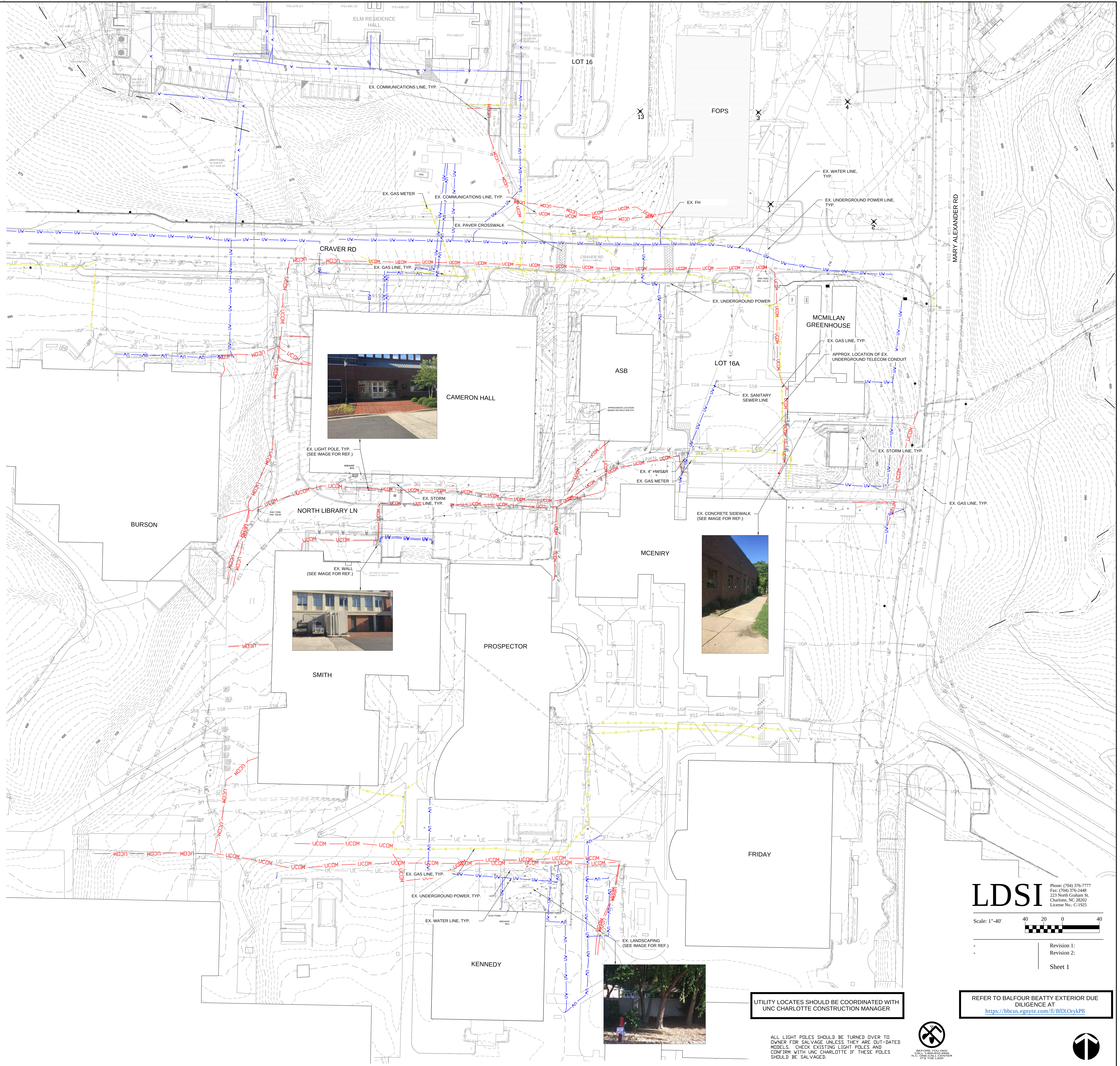
VICINITY MAP
NTS

Notes:

1. Deed Reference(s) –
2. Tax Parcel ID –
3. Current Owner –
4. All bearings are NC Grid bearings.
5. All distances are shown horizontal.
6. Grid distance = Horizontal distance x Combined Grid Factor (0.00000000)
7. Area –
8. Areas have been determined by coordinate computation.
9. Iron pins (#5 Rebar) or other monumentation (as shown) found or set at all property corners.
10. Zoning –
11. This property (is/is not) located in a special Flood Hazard Area as determined by FEMA and the State of North Carolina. Reference Community Panel Number: Dated:
12. This survey was performed without benefit of a Title Commitment Report. LandDesign Surveying, Inc. does not claim that all matters of record which may affect the subject property are shown hereon.
13. The location of underground utilities shown on this map are approximate, based on information provided by others or by field location. Utility locations as shown hereon are intended for planning only. Actual location, size or depth of line should be verified with the individual utility company before construction.
14. The North Carolina Grid Coordinates shown on this map were derived by static differential GPS observations using Trimble 4700 Receivers and processed using Online Positioning User Service.

Legend

EIP	Existing Iron Pin
	Utility Pole
	Light Pole
ou	Overhead Utility
x	Fence Line
G	Gas Line
UGC	Underground Telephone
UGP	Underground Electric
	Sign
S	Sanitary Manhole
D	Storm Manhole
E	Electrical Manhole
T	Telecom Manhole
FH	Fire Hydrant
WM	Water Meter
WV	Water Valve
IV	Irrigation Valve
BOC	Back of Curb
EOP	Edge of Pavement
R/W	Right-of-Way
N/F	Now or Formerly
	Rip Rap
	Brick Pavers



UTILITY LOCATES SHOULD BE COORDINATED WITH UNC CHARLOTTE CONSTRUCTION MANAGER

ALL LIGHT POLES SHOULD BE TURNED OVER TO OWNER FOR SALVAGE UNLESS THEY ARE OUT-DATED MODELS. CHECK EXISTING LIGHT POLES AND CONFIRM WITH UNC CHARLOTTE IF THESE POLES SHOULD BE SALVAGED.

BEFORE YOU DIG!
CALL 1-800-632-4949
N.C. ONE-CALL CENTER
IT'S THE LAW!

LDSI
Phone: (704) 376-7777
Fax: (704) 376-2448
223 North Graham St.
Charlotte, NC 28202
License No.: C-1925

Scale: 1"-40'
40 20 0 40

Revision 1:
Revision 2:
Sheet 1

REFER TO BALFOUR BEATTY EXTERIOR DUE DILIGENCE AT https://bbcus.egnyte.com/fl/BfDLOrykPB

UNC CHARLOTTE

Sciences Building - Existing Building Heating Conversions
9201 University City Boulevard
Charlotte, NC 28223

SCO ID Number: 16-14355-02B
Code: 46626
Item: 301

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CLARKNEXSEN
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704.377.8800

LandDesign.
223 N Graham Street Charlotte, NC 28202
V: 704.333.0325 F: 704.332.3246
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CONSULTANT

SEALS
Nov 20 2017 5:12 PM
LANDDESIGN, INC. SEAL C-0658 NORTH CAROLINA
NORTH CAROLINA PROFESSIONAL SEAL 033804 ENGINEER MARC D. MONSEN

NC Corporate Engineering License #: C-0658

SUBMITTAL
05 November 2017
Bid Documents

REVISIONS

SHEET
EX CONDITIONS

C-050

DESIGN: MDM
DRAWN: GR
REVIEW: MDM

CN 6222

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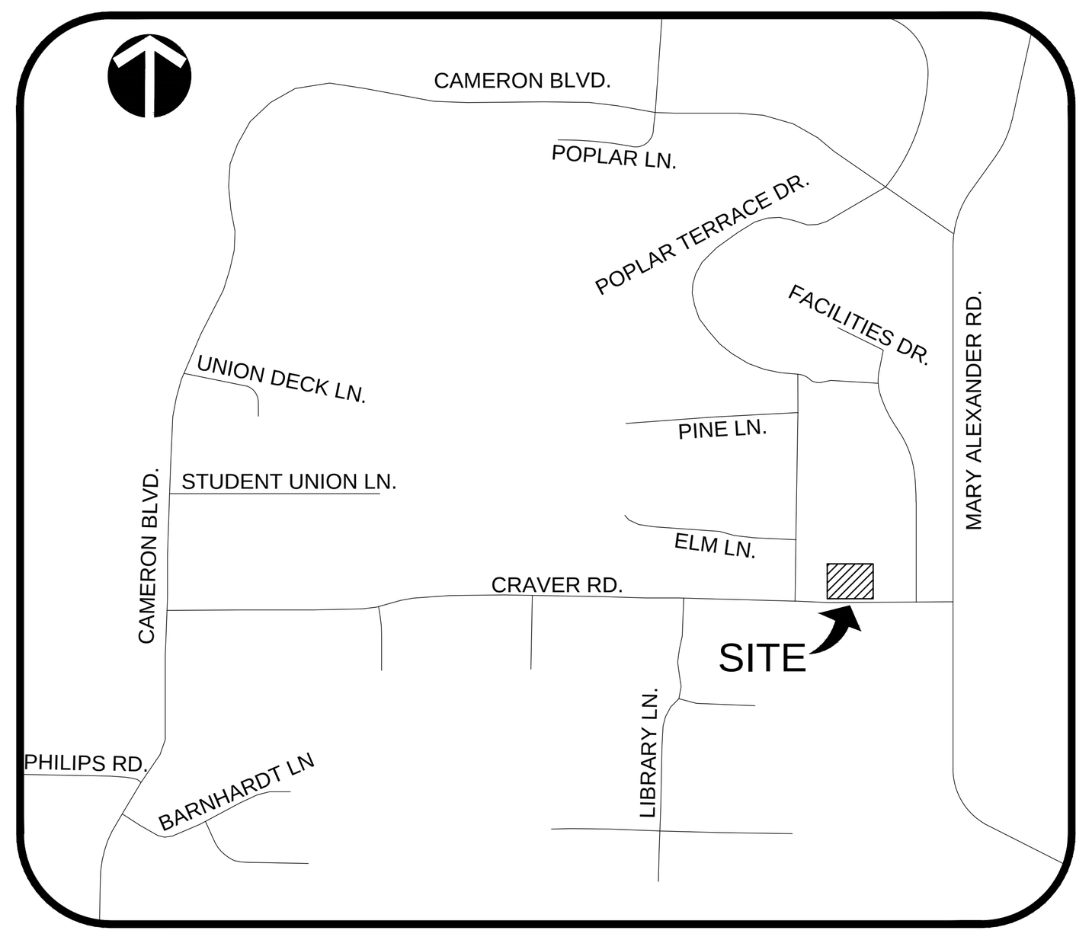


VICINITY MAP
NTS

GENERAL NOTES:

1. ALL PROPERTY AFFECTED BY THIS WORK SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN THE EXISTING UNLESS OTHERWISE SPECIFICALLY EXEMPTED BY THESE PLANS. CONTRACTOR TO CLEAN-UP, RESTORE, AND REPLANT WORK AREAS UPON COMPLETION.

2. THE CONTRACTOR IS CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, PREVIOUS DESIGN DOCUMENTS, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE LOCATION OF EXISTING UTILITIES MUST BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

3. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE OWNER AND ENGINEER ANY DISCREPANCIES FOUND BETWEEN ACTUAL FIELD CONDITIONS AND CONSTRUCTION DOCUMENTS AND SHALL WAIT FOR INSTRUCTIONS PRIOR TO PROCEEDING.

4. PRIOR TO BEGINNING CONSTRUCTION THE CONTRACTOR IS RESPONSIBLE TO VERIFY THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED FROM ALL REGULATORY AUTHORITIES AND SHALL BE THOROUGHLY FAMILIAR WITH CONDITIONS OF SAID PERMITS AND INSPECTION REQUIREMENTS.

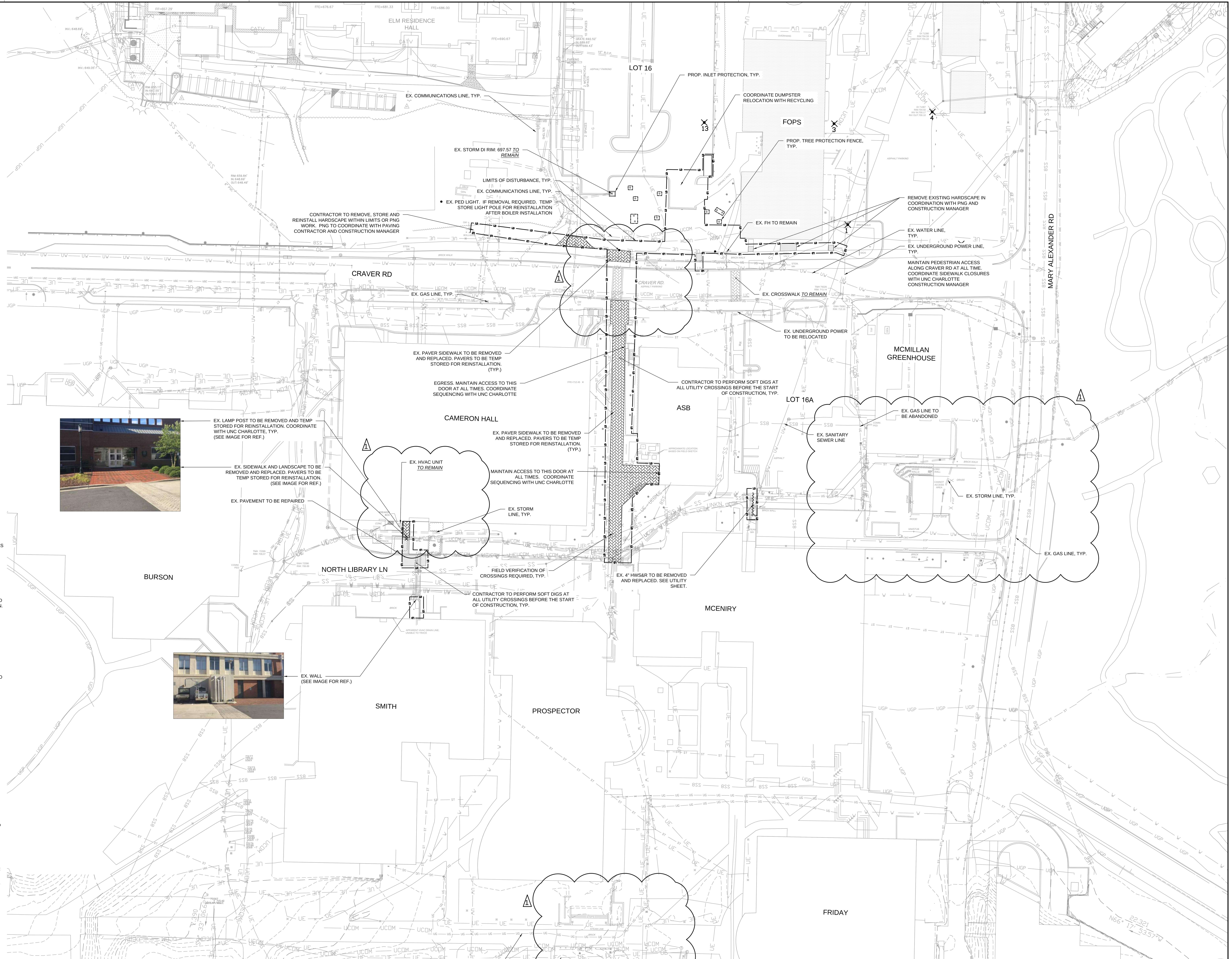
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ANY EXISTING ITEM AND/OR MATERIAL INSIDE OR OUTSIDE THE CONSTRUCTION LIMITS.

6. CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKERS AND PUBLIC ARE PROTECTED FROM INJURY.

7. LANDDESIGN SHALL NOT BE IN CONTROL OR CHARGE OF, AND SHALL NOT BE RESPONSIBLE FOR ACTUAL CONSTRUCTION MEANS, METHODS, TECHNIQUES, PROCEDURES, OR SAFETY PRECAUTIONS IN CONNECTION WITH THE WORK, OR FOR THE ACTS OR OMISSIONS OF CONTRACTORS OR ANY OTHER PERSONS NOT UNDER THE EMPLOYMENT OF LANDDESIGN.

DEMOLITION NOTES:

1. CONTRACTOR SHALL SUBMIT DEMOLITION SCHEDULE TO OWNER PRIOR TO PROCEEDING WITH DEMOLITION ACTIVITIES.
2. EXTENT OF SITE CLEARING IS SHOWN ON DRAWINGS. SITE DEMOLITION WORK INCLUDES, BUT IS NOT LIMITED TO:
   - 2.1. PAVER SIDEWALKS/CROSSWALKS
   - 2.2. SITE UTILITIES
   - 2.3. LANDSCAPING
   - 2.4. HARDSCAPE
3. CONDUCT SITE DEMOLITION 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.
4. RESTORE DAMAGED IMPROVEMENTS TO THEIR ORIGINAL CONDITION, AS ACCEPTABLE TO PARTIES HAVING JURISDICTION.
5. REMOVE WASTE MATERIALS AND UNSUITABLE AND EXCESS TOPSOIL FROM PROPERTY AND DISPOSE OF OFF-SITE IN A LEGAL MANNER.
6. LOCATE EXISTING ABOVE GROUND AND UNDERGROUND UTILITIES IN AREAS OF WORK. IF UTILITIES ARE TO REMAIN IN PLACE, PROVIDE ADEQUATE MEANS OF SUPPORT AND PROTECTION DURING DEMOLITION OPERATION.
7. SHOULD UNCHARTED, OR INCORRECTLY CHARTED PIPING OR OTHER UTILITIES BE ENCOUNTERED DURING DEMOLITION, CONSULT PROJECT ENGINEER AND UTILITY OWNER FOR IMMEDIATE ACTION.
8. DEMOLISH AND COMPLETELY REMOVE FROM SITE MATERIAL INDICATED ON PLAN OR NOTES "TO BE REMOVED".
9. PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT AND OTHER HAZARDS CREATED BY THE DEMOLITION OPERATION.
10. CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO EXISTING CONDITIONS OR BETTER. FURTHERMORE, CONTRACTOR SHALL PROVIDE TO ENGINEER PHOTOGRAPH OF PRE-CONSTRUCTION CONDITIONS AND POST-CONSTRUCTION CONDITIONS AS NOTED ON PLANS.
11. CONTRACTOR SHALL MAINTAIN STORMWATER MANAGEMENT SYSTEM DURING CONSTRUCTION TO ENSURE NO DAMAGE TO ADJACENT PROPERTIES OCCURS DURING STORM EVENTS.
12. CONTRACTOR TO REMOVE ALL VISIBLE OR REASONABLY IDENTIFIABLE MATERIAL, EQUIPMENT, ETC. FROM THE SITE IF NOT NEEDED FOR NEW CONSTRUCTION.
13. SURVEY DATUM IS FROM THE BOUNDARY AND TOPOGRAPHIC SURVEY PROVIDED BY LDSI SURVEYORS.
14. THE LOCATION OF ALL UTILITIES SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM AVAILABLE INFORMATION AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER AND OWNER ASSUME NO RESPONSIBILITY FOR INACCURACY.
15. ALL DEMOLITION AND CONSTRUCTION SHALL COMPLY WITH APPLICABLE BUILDING CODES AND LOCAL RESTRICTIONS. THE CONTRACTOR MUST COMPLY WITH ALL OF THE CONTRACTOR REGISTRATION REQUIREMENTS OF ALL GOVERNING AUTHORITIES.
16. PRIOR TO THE COMMENCEMENT OF DEMOLITION, THE CONTRACTOR IS TO COORDINATE FULLY WITH UNC CHARLOTTE ON THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION. UNC CHARLOTTE WILL LOCATE ALL UNDERGROUND UTILITIES.
17. MINIMUM DEPTH FOR REMOVAL OF ALL OBJECTS SHALL BE TWO (2) FEET BELOW GRADE. THE CONTRACTOR IS RESPONSIBLE FOR PROPER DISPOSAL OF ALL WASTE MATERIAL.
18. ALL PAVING REMOVAL AND DEMOLITION SHALL BE PERFORMED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER OR OWNER.
19. RELOCATION OR REMOVAL OF OVERHEAD OR UNDERGROUND UTILITIES SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY.
20. CONTRACTOR SHALL REMOVE ALL EXISTING LIGHT POLES IN THE DEMOLITION AREA AT THE OWNERS DIRECTION.
21. ALL PROPOSED PAVEMENT CUTS SHALL BE SAW CUT ONLY.
22. CONTRACTOR SHALL PROVIDE A MINIMUM OF 72 HOURS ADVANCE NOTICE TO THE OWNER PRIOR TO STARTING DEMOLITION ACTIVITIES.
23. CONTRACTOR TO REMOVE, STORE AND REINSTALL ALL HARDSCAPE WITHIN LIMITS OF PIEDMONT NATURAL GAS WORK. PNG WILL COORDINATE WITH PAVING CONTRACTOR AND CONSTRUCTION MANAGER.


ELM RESIDENCE HALL
LOT 16
PROP. INLET PROTECTION, TYP.
COORDINATE DUMPSTER RELOCATION WITH RECYCLING
FOPS
PROP. TREE PROTECTION FENCE, TYP.
EX. COMMUNICATIONS LINE, TYP.
EX. STORM DI RIM: 697.57 TO REMAIN
LIMITS OF DISTURBANCE, TYP.
EX. COMMUNICATIONS LINE, TYP.
EX. PED LIGHT. IF REMOVAL REQUIRED. TEMP STORE LIGHT POLE FOR REINSTALLATION AFTER BOILER INSTALLATION
CONTRACTOR TO REMOVE, STORE AND REINSTALL HARDSCAPE WITHIN LIMITS OR PNG WORK. PNG TO COORDINATE WITH PAVING CONTRACTOR AND CONSTRUCTION MANAGER
EX. FH TO REMAIN
REMOVE EXISTING HARDSCAPE IN COORDINATION WITH PNG AND CONSTRUCTION MANAGER
EX. WATER LINE, TYP.
EX. UNDERGROUND POWER LINE, TYP.
MAINTAIN PEDESTRIAN ACCESS ALONG CRAVER RD AT ALL TIME. COORDINATE SIDEWALK CLOSURES WITH UNC CHARLOTTE CONSTRUCTION MANAGER
MARY ALEXANDER RD
CRAVER RD
EX. GAS LINE, TYP.
EX. CROSSWALK TO REMAIN
EX. UNDERGROUND POWER TO BE RELOCATED
MCMILLAN GREENHOUSE
EX. PAVER SIDEWALK TO BE REMOVED AND REPLACED. PAVERS TO BE TEMP STORED FOR REINSTALLATION. (TYP.)
EGRESS. MAINTAIN ACCESS TO THIS DOOR AT ALL TIMES. COORDINATE SEQUENCING WITH UNC CHARLOTTE
CONTRACTOR TO PERFORM SOFT DIGS AT ALL UTILITY CROSSINGS BEFORE THE START OF CONSTRUCTION, TYP.
CAMERON HALL
ASB
LOT 16A
EX. GAS LINE TO BE ABANDONED
EX. SANITARY SEWER LINE
EX. LAMP POST TO BE REMOVED AND TEMP STORED FOR REINSTALLATION. COORDINATE WITH UNC CHARLOTTE, TYP. (SEE IMAGE FOR REF.)
EX. PAVER SIDEWALK TO BE REMOVED AND REPLACED. PAVERS TO BE TEMP STORED FOR REINSTALLATION. (TYP.)
EX. HVAC UNIT TO REMAIN
EX. SIDEWALK AND LANDSCAPE TO BE REMOVED AND REPLACED. PAVERS TO BE TEMP STORED FOR REINSTALLATION. (SEE IMAGE FOR REF.)
MAINTAIN ACCESS TO THIS DOOR AT ALL TIMES. COORDINATE SEQUENCING WITH UNC CHARLOTTE
EX. PAVEMENT TO BE REPAIRED
EX. STORM LINE, TYP.
EX. STORM LINE, TYP.
EX. GAS LINE, TYP.
NORTH LIBRARY LN
FIELD VERIFICATION OF CROSSINGS REQUIRED, TYP.
EX. 4" HWS&R TO BE REMOVED AND REPLACED. SEE UTILITY SHEET.
CONTRACTOR TO PERFORM SOFT DIGS AT ALL UTILITY CROSSINGS BEFORE THE START OF CONSTRUCTION, TYP.
BURSON
MCENIRY
EX. WALL (SEE IMAGE FOR REF.)
SMITH
PROSPECTOR
FRIDAY
EX. GAS LINE, TYP.
EX. UNDERGROUND POWER, TYP.
EX. WATER LINE, TYP.
KENNEDY
N66° 17' 53.57"W 22.321

DEMOLITION LEGEND

REMOVE AND STORE LIGHT POLE	
REMOVE EXISTING CURB/UTILITY	
PROPERTY LINE	
SILT FENCE	
TREE PROTECTION FENCE	
LIMITS OF DISTURBANCE	
REMOVE AND REPLACE EX. WALKWAY	
REMOVE AND REPAIR EX. PAVEMENT	

UTILITY LOCATES SHOULD BE COORDINATED WITH UNC CHARLOTTE CONSTRUCTION MANAGER

REFER TO BALFOUR BEATTY EXTERIOR DUE DILIGENCE AT
https://bbcus.egnyte.com/fl/BfDLOrykPB

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BEFORE YOU DIG! CALL 1-800-632-4949 N.C. ONE-CALL CENTER IT'S THE LAW!

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UNC CHARLOTTE

Sciences Building - Existing Building Heating Conversions

9201 University City Boulevard
Charlotte, NC 28223

SCO ID Number: 16-14355-02B
Code: 46626
Item: 301

DESIGNER

CLARKNEXSEN

1523 Elizabeth Avenue, Suite 300
Charlotte, NC 28204
704.377.8800

LandDesign

223 N Graham Street Charlotte, NC 28202
V: 704.333.0325 F: 704.332.3246
www.LandDesign.com

CONSULTANT

SEALS

Nov 20 2017 5:12 PM

LANDDESIGN, INC. SEAL C-0658 ENGINEERING NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 033804 ENGINEER MARC D. MOMSEN

NC Corporate Engineering License #: C-0658

SUBMITTAL

05 November 2017

Bid Documents

REVISIONS

1	11/20/2017	ADDENDUM #1

SHEET

DEMOLITION AND EROSION CONTROL PLAN

C-100

DESIGN: MCM
DRAWN: GR
REVIEW: MCM

CN 6222

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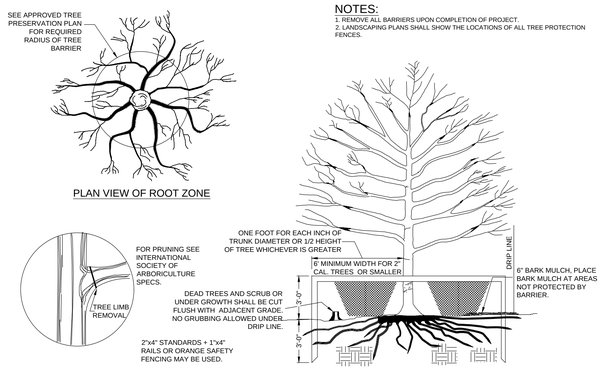
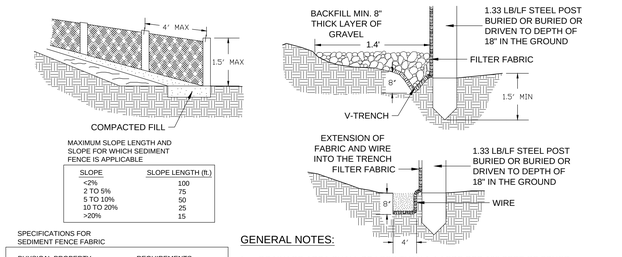


TREE PROTECTION DETAIL

PLAN AND SECTION

NOT TO SCALE



MAXIMUM SLOPE LENGTH AND SLOPE FOR WHICH SEDIMENT FENCE IS APPLICABLE

SLOPE	SLOPE LENGTH (ft.)
<2%	100
2 TO 5%	75
5 TO 10%	50
10 TO 20%	25
>20%	15

SPECIFICATIONS FOR SEDIMENT FENCE FABRIC

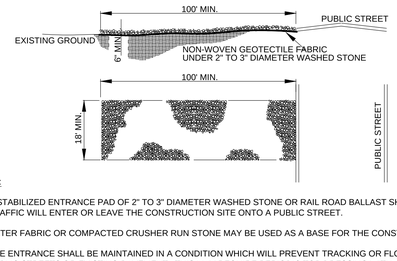
PHYSICAL PROPERTY	REQUIREMENTS
FILTERING EFFICIENCY	85% (MIN.)
TENSILE STRENGTH AT 20% (MAX.) ELONGATION	STANDARD STRENGTH- 30 LB./LIN. INCH (MIN.)
	EXTRA STRENGTH- 50 LB./LIN.IN (MIN.)
SLURRY FLOW RATE	0.3 GAL/SQ. FT/MIN (MIN.)

GENERAL NOTES:

1. DRAINAGE AREA SHALL BE LESS THAN 1/4 ACRE PER 100 FEET OF FENCE.
2. DEPTH OF WATER BEHIND FENCE SHALL NOT EXCEED 1.5 FEET.
3. FOR REINFORCEMENT OF FABRIC, USE 14 GAUGE MESH WITH 6" SPACING.
4. CONSTRUCT FENCE FROM A CONTINUOUS ROLL. JOINTS SHALL OVERLAP BY 4' MINIMUM.
5. IF WIRE MESH IS USED, FENCE POST SPACING MAY BE 8' MAXIMUM.
6. DO NOT ATTACH FABRIC TO EXISTING TREES.
7. INSPECT FENCES WEEKLY AND AFTER RAINFALL EVENTS. REPAIRS SHALL BE MADE IMMEDIATELY.
8. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO ENSURE ADEQUATE STORAGE VOLUMES.
9. PREFABRICATED SILT FENCE IS NOT ACCEPTABLE.

SILT FENCE

NOT TO SCALE



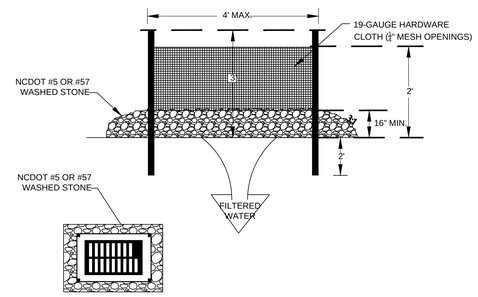
NOTES:

1. A STABILIZED ENTRANCE PAD OF 2" TO 3" DIAMETER WASHED STONE OR RAIL ROAD BALLAST SHALL BE LOCATED WHERE TRAFFIC WILL ENTER OR LEAVE THE CONSTRUCTION SITE ONTO A PUBLIC STREET.
2. FILTER FABRIC OR COMPACTED CRUSHER RUN STONE MAY BE USED AS A BASE FOR THE CONSTRUCTION ENTRANCE.
3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
4. ANY SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC STREETS MUST BE REMOVED IMMEDIATELY.
5. WHEN APPROPRIATE, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN SEE STD. NO. 30.11B.
6. ROADWAY TO BE KEPT FREE OF DEBRIS AT ALL TIMES

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

1. UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.
2. DRIVE 5-FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
3. SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACING A 2-FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.
4. PLACE CLEAN GRAVEL (NC DOT #5 OR #57 STONE) ON A 3:1 SLOPE WITH A HEIGHT OF 16 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.
5. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.
6. COMPACT THE AREA PROPERLY AND STABILIZED IT WITH GROUNDCOVER.



HARDWARE CLOTH AND GRAVEL INLET PROTECTION

NOT TO SCALE

UNC CHARLOTTE

Sciences Building - Existing Building Heating Conversions

9201 University City Boulevard
Charlotte, NC 28223

SCO ID Number: 16-14355-02B
Code: 46626
Item: 301

DESIGNER

CLARKNEXSEN

1523 Elizabeth Avenue, Suite 300
Charlotte, NC 28204
704.377.8800

LandDesign

223 N Graham Street Charlotte, NC 28202
V: 704.333.0325 F: 704.332.3246
www.LandDesign.com

CONSULTANT

SEALS

Max Morey Nov 20 2017 5:13 PM

LANDDESIGN, INC. SEAL C-0658 REGISTERED LANDSCAPE ARCHITECT NORTH CAROLINA

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT SEAL 033804 MARC D. MEMSEN

NC Corporate Engineering License #: C-0658

SUBMITTAL

05 November 2017

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REVISIONS

SHEET

EROSION CONTROL DETAILS

C-101

DESIGN: MCM
DRAWN: GR
REVIEW: MCM

CN 6222

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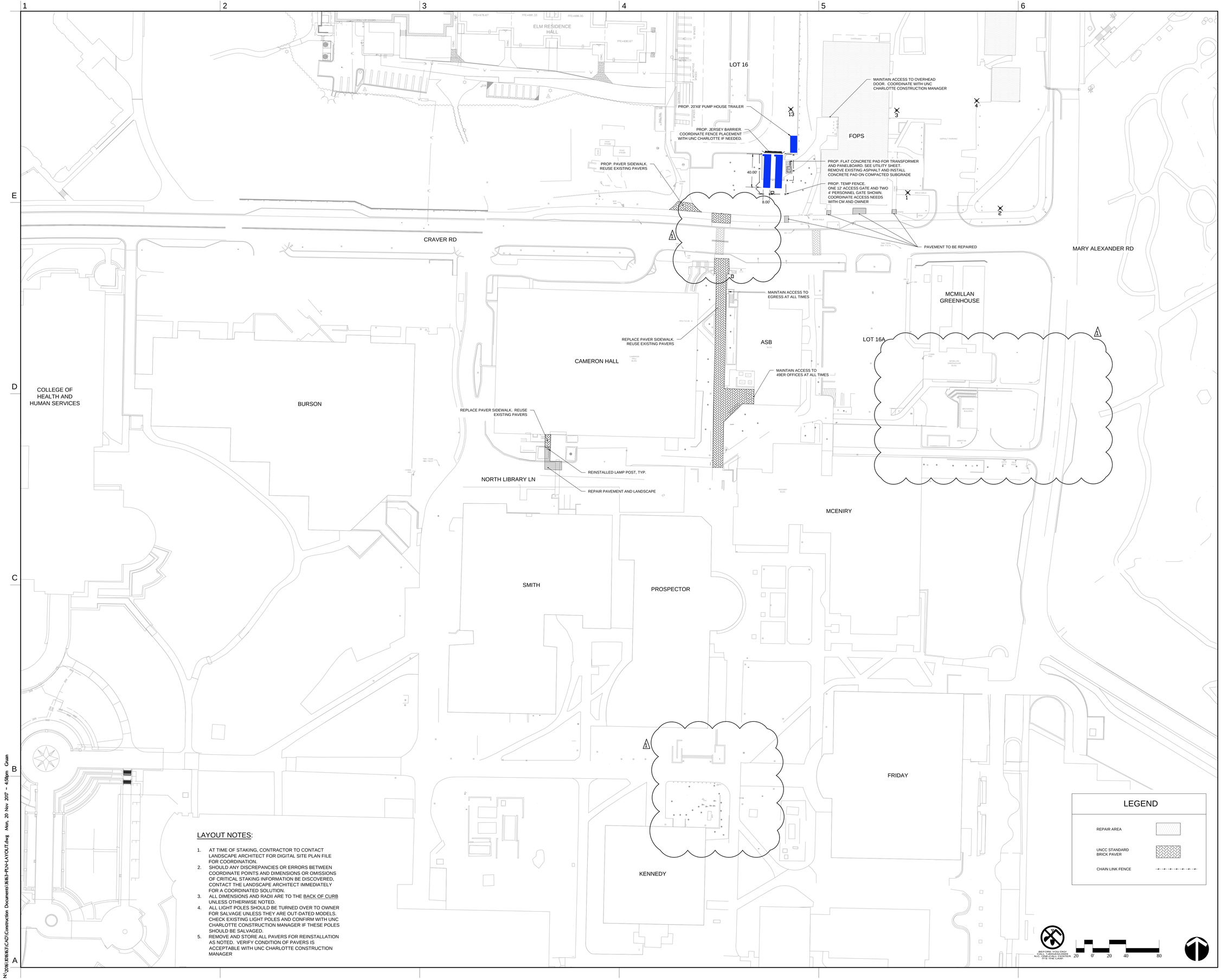

LAYOUT NOTES:

1. AT TIME OF STAKING, CONTRACTOR TO CONTACT LANDSCAPE ARCHITECT FOR DIGITAL SITE PLAN FILE FOR COORDINATION.
2. SHOULD ANY DISCREPANCIES OR ERRORS BETWEEN COORDINATE POINTS AND DIMENSIONS OR OMISSIONS OF CRITICAL STAKING INFORMATION BE DISCOVERED, CONTACT THE LANDSCAPE ARCHITECT IMMEDIATELY FOR A COORDINATED SOLUTION.
3. ALL DIMENSIONS AND RADII ARE TO THE BACK OF CURB UNLESS OTHERWISE NOTED.
4. ALL LIGHT POLES SHOULD BE TURNED OVER TO OWNER FOR SALVAGE UNLESS THEY ARE OUT-DATED MODELS. CHECK EXISTING LIGHT POLES AND CONFIRM WITH UNC CHARLOTTE CONSTRUCTION MANAGER IF THESE POLES SHOULD BE SALVAGED.
5. REMOVE AND STORE ALL PAVERS FOR REINSTALLATION AS NOTED. VERIFY CONDITION OF PAVERS IS ACCEPTABLE WITH UNC CHARLOTTE CONSTRUCTION MANAGER

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NORTH CAROLINA SEAL 033804 REGISTERED LANDSCAPE ARCHITECT MARC D. MOMSEN

NC Corporate Engineering License #: C-0658

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REVISIONS

1	11/20/2017	ADDENDUM #1

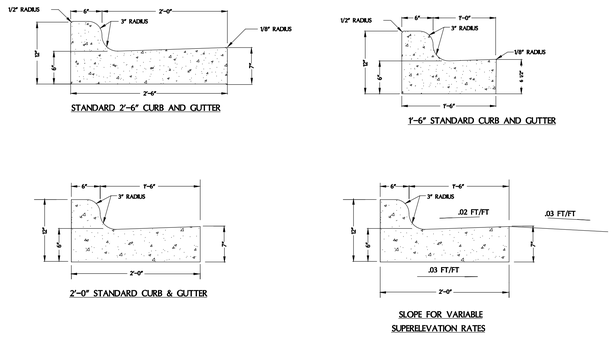
SHEET

LAYOUT PLAN

C-200

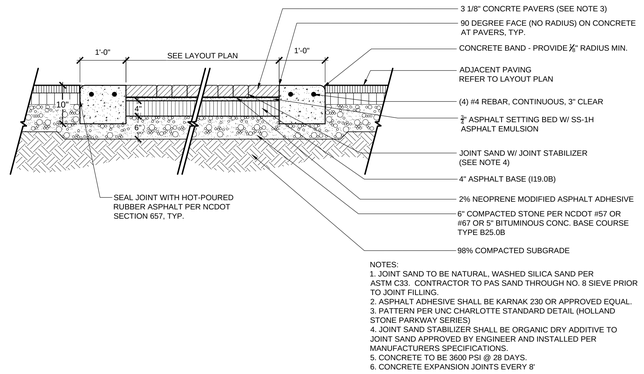
DESIGN: MCM
DRAWN: GR
REVIEW: MCM

CN 6222



STANDARD CURB AND GUTTER

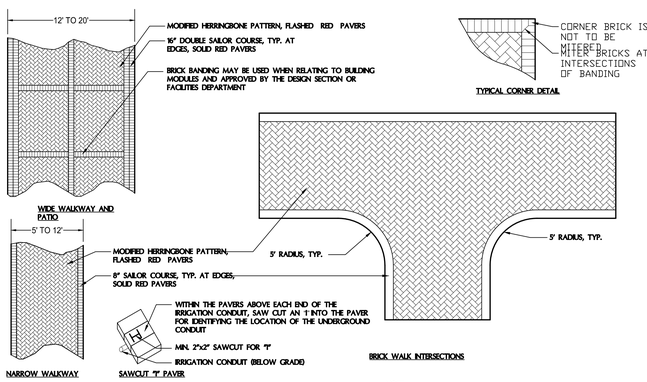
SECTION — NOT TO SCALE



NOTES:
1. JOINT SAND TO BE NATURAL, WASHED SILICA SAND PER ASTM C33. CONTRACTOR TO PAS SAND THROUGH NO. 8 SIEVE PRIOR TO JOINT FILLING.
2. ASPHALT ADHESIVE SHALL BE KARNAK 230 OR APPROVED EQUAL.
3. PATTERN PER UNC CHARLOTTE STANDARD DETAIL (HOLLAND STONE PARKWAY SERIES)
4. JOINT SAND STABILIZER SHALL BE ORGANIC DRY ADDITIVE TO JOINT SAND APPROVED BY ENGINEER AND INSTALLED PER MANUFACTURERS SPECIFICATIONS.
5. CONCRETE TO BE 3600 PSI @ 28 DAYS.
6. CONCRETE EXPANSION JOINTS EVERY 8'

PAVER CROSSWALK

SECTION — NOT TO SCALE

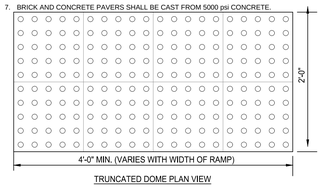


NOTE:
BRICK PAVERS AT RAMPS SHALL HAVE CUT BRICKS AT ALL RAMP SPRING LINES IN LIEU OF CONTRACTOR 'WARPING' BRICKS.

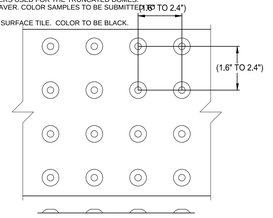
BRICK WALKWAY PATTERNS

PLAN — NOT TO SCALE

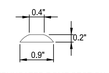
NOTES:
1. ALL DETECTABLE WARNING DEVICES USED IN NEW CONSTRUCTION SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT.
2. WIDTH OF DETECTABLE WARNING AREA SHALL BE A MINIMUM OF 4 FEET AND VARY WITH WIDTH OF RAMP.
3. LENGTH OF DETECTABLE WARNING AREA SHALL BE 2 FEET REGARDLESS OF SECTION WIDTH.
4. DETECTABLE WARNING AREA CAN BE SQUARE WHERE USED IN A CURB RADIUS.
5. DETECTABLE WARNING DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.
6. THE MATERIALS AND COLORS FOR THE DETECTABLE WARNING AREA SHALL BE AS FOLLOWS:
   A. WITHIN BRICK PAVER AREAS, THE MATERIAL SHALL BE 8"x4"x3½" VEHICULAR LOAD BRICK PAVER. COLOR TO HAVE A SIGNIFICANT COLOR DIFFERENTIATION BETWEEN THE ADJACENT ENGLISH RED BRICK PAVER AND THE PAVERS USED FOR THE TRUNCATED DOMES. TRUNCATED DOME PAVER COLOR TO BE DARKER THAN THE ADJACENT ENGLISH RED BRICK PAVER. COLOR SAMPLES TO BE SUBMITTED TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION.
   B. WITHIN CONCRETE PAVER AREAS, THE MATERIAL SHALL BE 8"x4"x3½" VEHICULAR LOAD CONCRETE PAVER. COLOR TO HAVE A SIGNIFICANT COLOR DIFFERENTIATION BETWEEN THE ADJACENT OAKS BLEND CONCRETE PAVER AND THE PAVERS USED FOR THE TRUNCATED DOMES. TRUNCATED DOME PAVER COLOR TO BE DARKER THAN THE ADJACENT OAKS BLEND CONCRETE PAVER. COLOR SAMPLES TO BE SUBMITTED TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION.
   C. WITHIN CONCRETE SIDEWALKS, THE MATERIAL SHALL BE A SURFACE APPLIED TACTILE WARNING SURFACE TILE. COLOR TO BE BLACK.
7. BRICK AND CONCRETE PAVERS SHALL BE CAST FROM 5000 psi CONCRETE.



TRUNCATED DOME PLAN VIEW



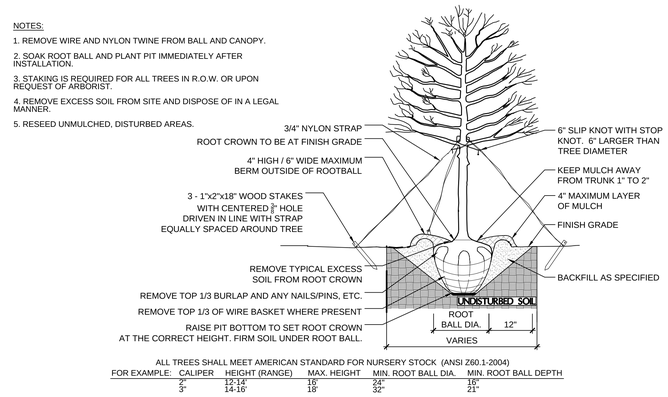
TRUNCATED DOME SPACING



TRUNCATED DOME SECTION

ACCESSIBLE RAMP - TRUNCATED DOMES

PLAN AND SECTION — NOT TO SCALE

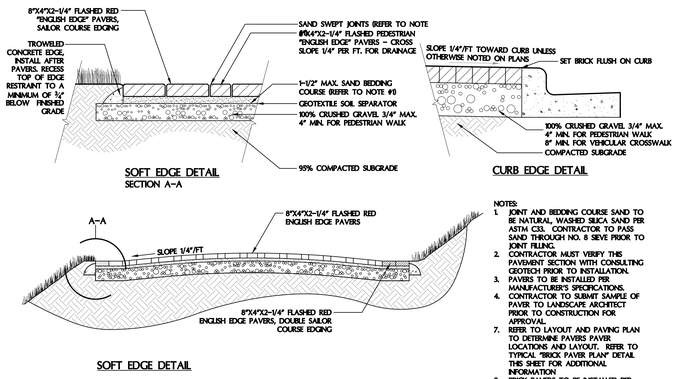


ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004)

FOR EXAMPLE:	CALIPER	HEIGHT (RANGE)	MAX. HEIGHT	MIN. ROOT BALL DIA.	MIN. ROOT BALL DEPTH
	2"	12-14'	16'	24"	16"
	3"	14-16'	18'	32"	21"

TREE PLANTING

FOR SINGLE AND MULTI-STEM TREES — NOT TO SCALE



SOFT EDGE DETAIL
SECTION A–A

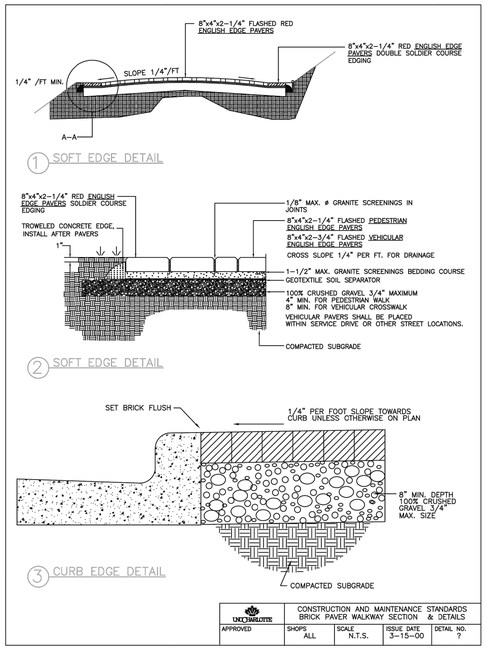
CURB EDGE DETAIL

SOFT EDGE DETAIL

NOTES:
1. JOINT AND BEDDING COURSE SAND TO BE NATURAL, WASHED SILICA SAND PER ASTM C33. CONTRACTOR TO PASS SAND THROUGH NO. 8 SIEVE PRIOR TO JOINT FILLING.
2. CONTRACTOR MUST VERIFY THIS PAVEMENT SECTION WITH CONSULTING GEOTECH PRIOR TO INSTALLATION.
3. PAVERS TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
4. CONTRACTOR TO SUBMIT SAMPLE OF PAVER TO LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION FOR APPROVAL.
7. REFER TO LAYOUT AND PAVING PLAN TO DETERMINE PAVERS PAVER LOCATIONS AND LAYOUT. REFER TO TYPICAL "BRICK PAVER PLAN" DETAIL THIS SHEET FOR ADDITIONAL INFORMATION
8. BRICK PAVERS TO BE INSTALLED PER UNCC CRI STANDARDS.
9. BRICK PAVERS AT RAMPS SHALL HAVE CUT BRICKS AT ALL RAMP SPRING LINES IN LIEU OF CONTRACTOR 'WARPING' BRICKS.

BRICK PAVER

SECTION — NOT TO SCALE



UNC CHARLOTTE	CONSTRUCTION AND MAINTENANCE STANDARDS BRICK PAVER WALKWAY SECTION & DETAILS			
APPROVED	SHOPS ALL	SCALE N.T.S.	ISSUE DATE 3-15-00	DETAIL NO. ?

BRICK PAVER SIDEWALK

NOT TO SCALE

UNC CHARLOTTE

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LANDDESIGN, INC. NORTH CAROLINA SEAL C-0658

NORTH CAROLINA PROFESSIONAL SEAL 033804 ENGINEER MARC D. MCMSTN

NC Corporate Engineering License #: C-0658

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05 November 2017

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REVISIONS

SHEET

SITE DETAILS

C-201

DESIGN: MCM
DRAWN: GR
REVIEW: MCM

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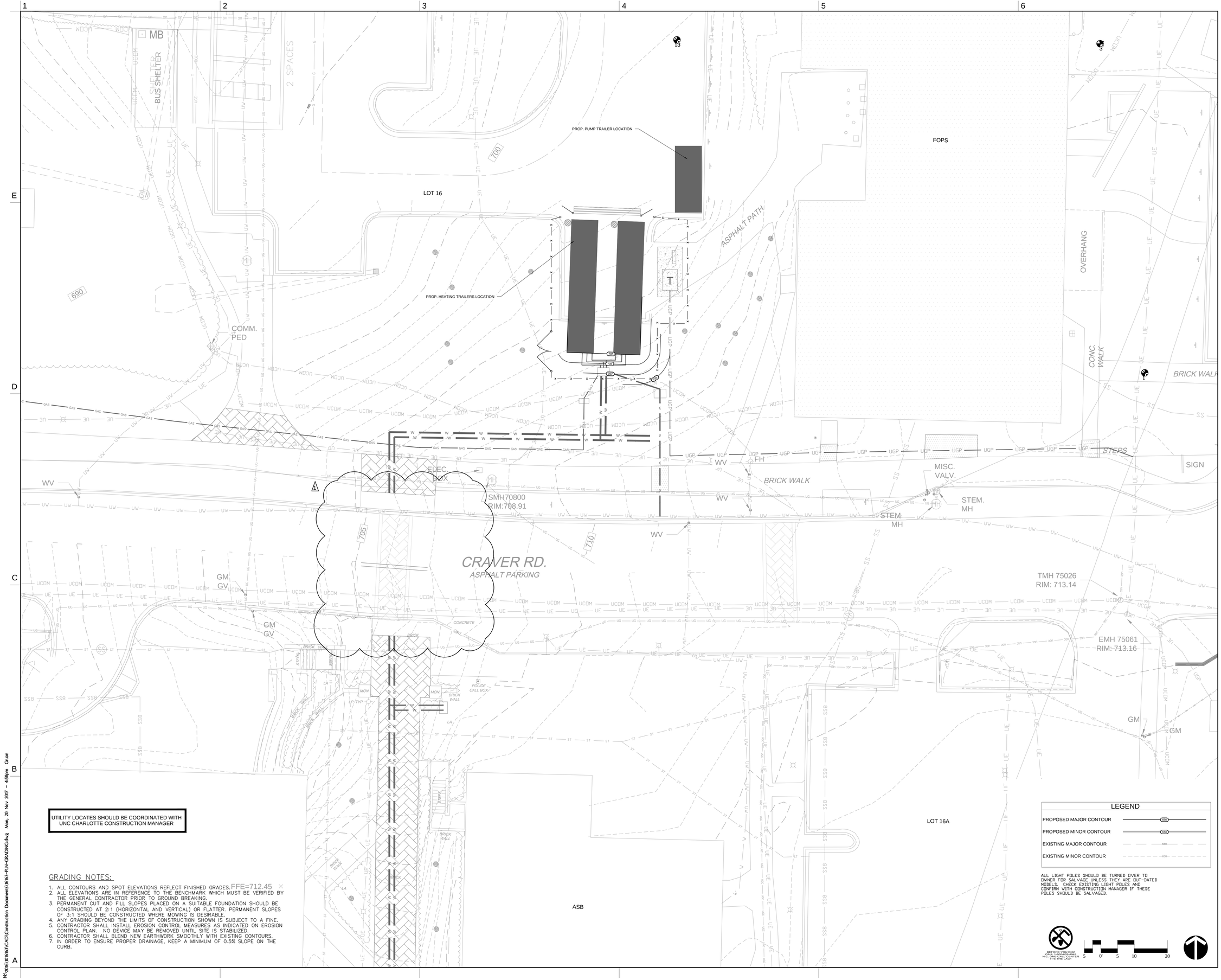

UTILITY LOCATES SHOULD BE COORDINATED WITH UNC CHARLOTTE CONSTRUCTION MANAGER

GRADING NOTES:

1. ALL CONTOURS AND SPOT ELEVATIONS REFLECT FINISHED GRADES. FFE=712.45
2. ALL ELEVATIONS ARE IN REFERENCE TO THE BENCHMARK WHICH MUST BE VERIFIED BY THE GENERAL CONTRACTOR PRIOR TO GROUND BREAKING.
3. PERMANENT CUT AND FILL SLOPES PLACED ON A SUITABLE FOUNDATION SHOULD BE CONSTRUCTED AT 2:1 (HORIZONTAL AND VERTICAL) OR FLATTER. PERMANENT SLOPES OF 3:1 SHOULD BE CONSTRUCTED WHERE MOWING IS DESIRABLE.
4. ANY GRADING BEYOND THE LIMITS OF CONSTRUCTION SHOWN IS SUBJECT TO A FINE.
5. CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES AS INDICATED ON EROSION CONTROL PLAN. NO DEVICE MAY BE REMOVED UNTIL SITE IS STABILIZED.
6. CONTRACTOR SHALL BLEND NEW EARTHWORK SMOOTHLY WITH EXISTING CONTOURS.
7. IN ORDER TO ENSURE PROPER DRAINAGE, KEEP A MINIMUM OF 0.5% SLOPE ON THE CURB.

LEGEND

PROPOSED MAJOR CONTOUR	695
PROPOSED MINOR CONTOUR	695
EXISTING MAJOR CONTOUR	660
EXISTING MINOR CONTOUR	658

ALL LIGHT POLES SHOULD BE TURNED OVER TO OWNER FOR SALVAGE UNLESS THEY ARE OUT-DATED MODELS. CHECK EXISTING LIGHT POLES AND CONFIRM WITH CONSTRUCTION MANAGER IF THESE POLES SHOULD BE SALVAGED.

BEFORE YOU DIG! CALL 1(800)632-4949 N.C. ONE-CALL CENTER IT'S THE LAW!

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N:\2016\016633\CAD\Construction Documents\16633-PLN-GRADING.dwg Mon, 20 Nov 2017 - 4:58pm Gruan

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CONSULTANT

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LANDDESIGN, INC. SEAL C-0658 NORTH CAROLINA LANDSCAPE ARCHITECTURE

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NORTH CAROLINA SEAL 033804 ENGINEERING MARC D. MOMSEN

NC Corporate Engineering License #: C-0658

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05 November 2017

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1	11/20/2017	ADDENDUM #1

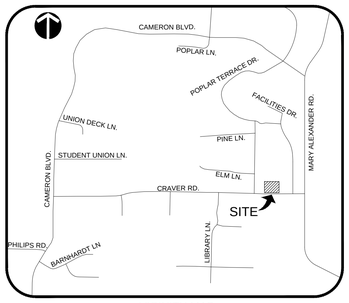
SHEET

GRADING PLAN

C-300

DESIGN: MCM
DRAWN: GR
REVIEW: MCM

CN 6222



VICINITY MAP
NTS

GENERAL NOTES:

1. REFER TO NCDEQ DESIGN MANUAL (WATER AND SEWER POLICIES, PROCEDURES, STANDARDS, AND SPECIFICATIONS) FOR ALL NECESSARY DETAILS, MATERIALS, AND SPECIFICATIONS.
2. VERIFY ALL EXISTING UTILITY CONFLICT AREAS TO DETERMINE TOP/BOTTOM OF PIPE. IF ACTUAL ELEVATIONS ARE DIFFERENT FROM THOSE SHOWN ON THIS PLAN, CONTACT THE ENGINEER (LANDDESIGN, INC. : 704-333-0325) BEFORE COMMENCING WITH CONSTRUCTION.
3. POTABLE DOMESTIC WATER METERING SHALL BE BY TURBINE OR NUTATING DISK METER WITH MAGNETIC DRIVE. METER TO BE LOCATED IN MECHANICAL ROOM, EASILY ACCESSIBLE,READ IN HUNDREDS OF CUBIC FEET, AND PROVIDE OUTPUT TO BUILDING AUTOMATION.
4. NON-SEWERED WATER (CONSUMED BUT NOT RETURNED TO THE SEWER, E.G. IRRIGATION, COOLING TOWER MAKEUP, ETC.) SHOULD BE METERED AT ITS SOURCE.METER SHOULD BE LOCATED IN MECHANICAL ROOM, EASILY ACCESSIBLE, READ IN HUNDREDS OF CUBIC FEET AND PROVIDE OUTPUT TO BUILDING AUTOMATION.
5. NATURAL GAS METERING SHALL COMPLY WITH ALL REQUIREMENTS OF PIEDMONT NATURAL GAS, AND INTERFACE TO THE BUILDING AUTOMATION SYSTEM.
6. ROOF DRAIN LEADERS ABOVE GRADE SHALL BE GALVANIZED STEEL OR CAST IRON PIPING WITH NO-HUB OR BELL AND SPIGOT JOINTS WITH COMPRESSION GASKETS. ALL ROOF DRAIN PIPING BELOW GRADE SHALL BE CAST IRON PIPING WITH BELL AND SPIGOT JOINTS WITH COMPRESSION GASKETS
7. COORDINATION OF DIVISIONS OF WORK: CARE IS REQUIRED IN PREPARATION OF DOCUMENTS TO ASSURE NO OVERLAPPING AND NO GAPS BETWEEN THE WORK FOR THE VARIOUS CONTRACTS. EACH CONTRACTOR SHALL BE REQUIRED TO PERFORM EXCAVATION, TRENCHING, AND BACKFILL FOR HIS INSTALLATIONS. MATERIALS AND COMPACTION OF FILL MATERIALS SHALL MEET THE REQUIREMENTS STIPULATED IN DIVISION 2, REGARDLESS OF WHO PERFORMS THIS WORK; THEREFORE, IN DIVISIONS 15 AND 16 THE REQUIREMENTS OF EARTHWORK MAY BE BEST SPECIFIED BY MAKING REFERENCE TO DIVISION 2.
8. MANHOLES: MANHOLE FRAME, COVER, AND GRATE CASTINGS SHALL INCLUDE THE NAME AND LOCATION OF THE MANUFACTURER. COVERS SHALL HAVE CAST IDENTIFICATION MARKINGS OF "STORM DRAIN", SANITARY, "STEAM", "ELECTRICAL", "TELEPHONE"" ETC. AS APPROPRIATE. MASONRY MANHOLES SHALL BE PARGE COATED INSIDE AND OUT. MANHOLES ARE CONSIDERED CONFINED SPACES AND APPROPRIATE SAFETY MEASURES SHOULD BE TAKEN WHEN ENTERING THEM.
9. CONTACT LANDDESIGN INC. AT 704-333-0325 IF ANY PIPE CROSSING VERIFICATION IS DIFFERENT THAN WHAT IS SPECIFIED ON THE PLAN.

TRACER NOTES

1.1 MECHANICAL IDENTIFICATION

A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:

B. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems..

C. 2012 NC Gas Code, section 404.15.3 Tracer: An insulated copper tracer wire or other approved conductor shall be installed adjacent to underground nonmetallic piping. Access shall be provided to the tracer wire or the tracer wire shall terminate aboveground at the end of the nonmetallic piping. The tracer wire size shall not be less than 18AWG and the insulation type suitable for direct burial.

D. All pipe, including lawn irrigation lines, and metallic pipe with compression gasket fittings installed underground shall have a tracer wire installed along the length of the pipe. The wire shall be taped to the bottom of the pipe at a maximum of 10' intervals and not allowed to "float freely" within the backfill.

E. TRACER WIRE

1. Tracer wire shall be single-conductor, 12 gauge minimum, copper single-conductor wire with type "UF" (Underground Feeder) insulation, and shall be continuous along the pipeline passing through the inside of each valve box. A #12 AWG or heavier (smaller AWG number), solid, insulated (RHW, THW, or polyethylene insulation is recommended), copper wire shall be taped to pipe at 10 foot intervals. Do not wrap wire around pipe. The wire must be one continuous, unbroken length. Coil tracer wire at meter location and street end with enough wire to extend a minimum of two feet above grade.

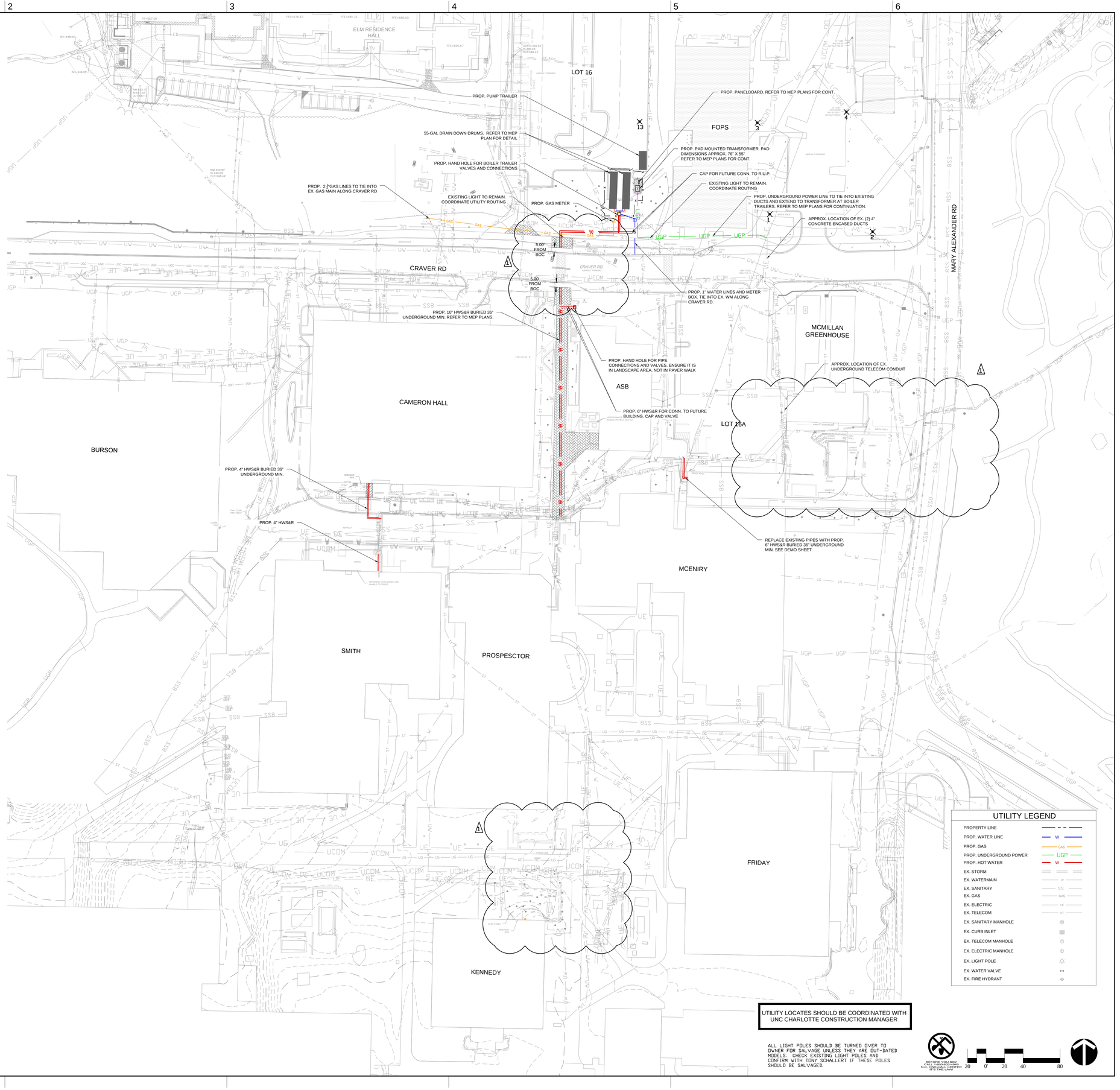
F. TRACER WIRE BOXES: Plastic gas and water services longer than 1000 feet in length from curb valve to meter riser must have tracer wire boxes installed in accordance with UNC Charlotte standards.

G. All underground piping and utilities (both metallic and non-metallic), except copper pipe, shall have a separate copper tracer wire and non-metallic warning tape installed above the utility line.

H. The tracer wire shall be traced for continuity prior to backfill, immediately upon completion of backfill and compaction and once again during final utility location/as-built at the end of the project. This also will include landscape irrigation mains to the points of the valves. All above ground utility features such as vaults, manholes, valves, handholds, etc to be PROP.erly labeled. Contractor shall provide an inventory of all installed outdoor utility features including type and model.

I. Identification Tape: The 1st stage of identification shall be a buried warning tape. This tape shall provide an early warning at shallow depth excavation. The tape shall be 6" wide, and buried approximately 18" to 30" above the service pipe, but a minimum of 10" below finished grade. It shall consist of multiple layers of polyethylene with an overall thickness of 3 to 5 mils. It shall be installed continuous from valve box to valve box or manhole to manhole, and shall terminate just outside of valve box or manhole wall. The black colored lettering on the warning tape shall be abrasion resistant and be imprinted on a color-coded background that conforms to APWA color code standards. The lettering on the tape should name the utility it is protecting, (i.e. Caution Buried Sewer Line Below).

J. TRACER WIRE: The 2nd stage of identification shall be a buried tracer wire. This tracer wire shall provide pipeline identification, be fully detectable from above grade utility locators, and be able to provide a depth reference point to top of pipe.



UTILITY LEGEND

PROPERTY LINE	
PROP. WATER LINE	W
PROP. GAS	GAS
PROP. UNDERGROUND POWER	UGP
PROP. HOT WATER	W
EX. STORM	
EX. WATERMAIN	W
EX. SANITARY	SS
EX. GAS	GAS
EX. ELECTRIC	UE
EX. TELECOM	UT
EX. SANITARY MANHOLE	
EX. CURB INLET	
EX. TELECOM MANHOLE	
EX. ELECTRIC MANHOLE	
EX. LIGHT POLE	
EX. WATER VALVE	
EX. FIRE HYDRANT	

UTILITY LOCATES SHOULD BE COORDINATED WITH UNC CHARLOTTE CONSTRUCTION MANAGER

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NC Corporate Engineering License #: C-0658

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REVISIONS

1	11/20/2017	ADDENDUM #1

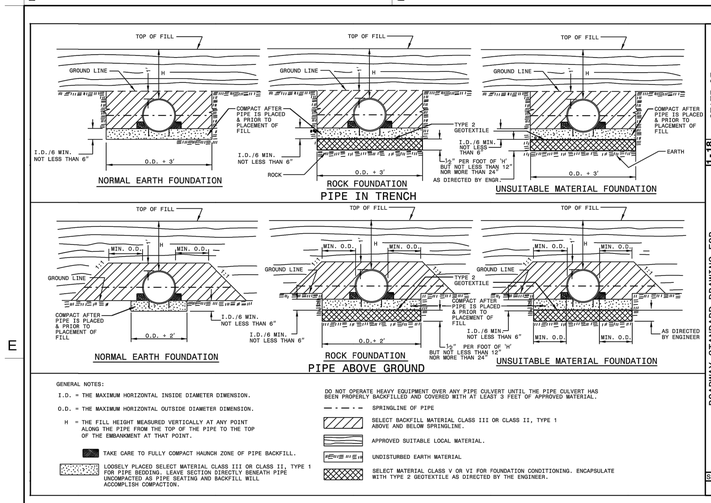
SHEET

UTILITY PLAN

C-400

DESIGN: MCM
DRAWN: GR
REVIEW: MCM

CN 6222



GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

APPROVED SUITABLE LOCAL MATERIAL.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE 2 GEOTEXTILE AS DIRECTED BY THE ENGINEER.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

I-18

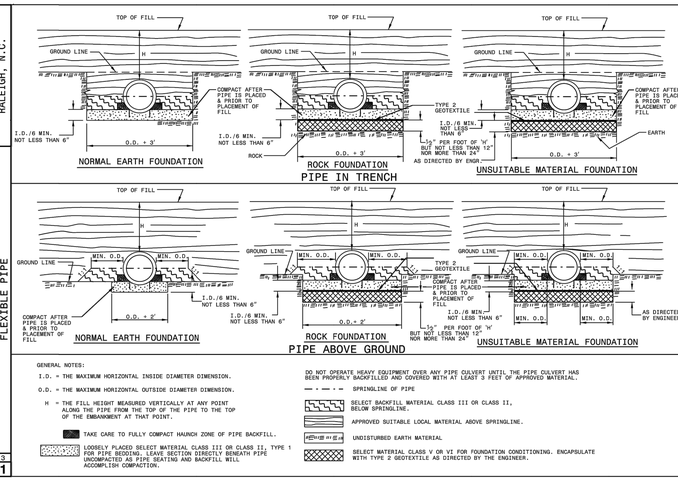
ROADWAY STANDARD DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3

300.01



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STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

I-18

ROADWAY STANDARD DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 3

300.01

FLEXIBLE PIPE

Round Corrugated Steel Pipe
2 2/3 x ½ corrugation **

Diameter (Inches)	Minimum cover (Inches)	(Ga)	Maximum Height of Cover (feet) 16	14	12	10	8
12	12		204	256			
15	12		162	204			
18	12		133	169	239		
21	12		115	145	204		
24	12		100	126	178		
30	12		79	100	142		
36	12		65	83	117	152	
42	12		55	70	100	130	160
48	12		48	61	87	113	139
54	12			54	77	100	123
60	12				69	90	111
66	12					81	100
72	12					74	91
78	12						81
84	12						69

Round Corrugated Aluminum Pipe
2 2/3 x ½ corrugation **

Diameter (Inches)	Minimum cover (Inches)	(Ga)	Maximum Height of Cover (feet) 16	14	12	10	8
12	12		123	155	218	281	344
15	12		98	123	174	224	275
18	12		81	102	144	187	228
21	12		69	87	123	160	195
24	12		60	76	108	139	171
27	12			67	95	123	151
30	12			60	85	111	136
36	12			50	71	92	113
42	12				60	78	96
48	12				52	68	84
54	12				46	50	74
60	12					50	62
66	12						51
72	12						41

** FOR DIFFERENT CORRUGATIONS AND ARCH PIPES REFER TO ROADWAY DESIGN MANUAL OR MANUFACTURERS SPECIFICATION.

HDPE - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 60"
* (Maximum fill) 20' for pipe diameters ≤ 24"
17' for pipe diameters ≥ 30" and ≤ 60"

PVC - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 36"
* (Maximum fill) 30' for pipe diameters ≥ 12" and ≤ 36"

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

CSP - AASHTO M36
CAAP - AASHTO M196
HDPE - AASHTO M294
PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

RIGID PIPE

RCP - * (Minimum fill) 1' for Class IV & CLASS V
2' for Class III & Class II

* (Maximum fill) 10' - Class II pipe
20' - Class III pipe
30' - Class IV pipe
40' - Class V pipe

(For fills > 40' & < 80' use LRFD Direct Design Method)

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

I-18

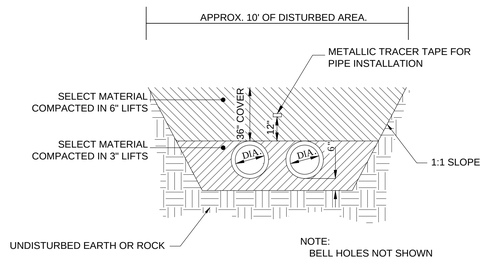
ROADWAY STANDARD DRAWING FOR

METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3

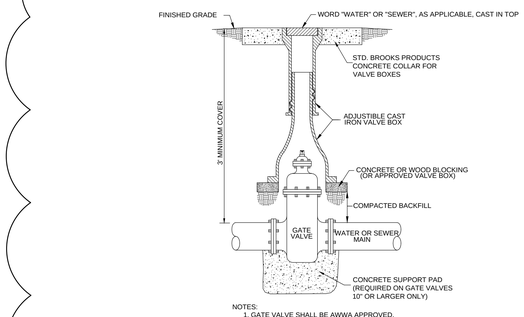
300.01



NOTE:
BELL HOLES NOT SHOWN

TYPICAL TRENCHING

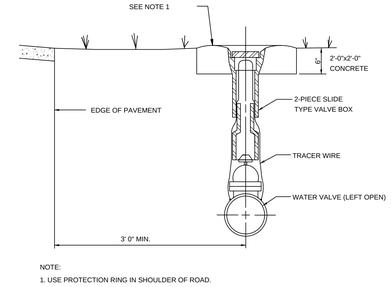
FOR SINGLE AND MULTI-STEM TREES — NOT TO SCALE



NOTES:
1. GATE VALVE SHALL BE AWWA APPROVED.
2. GATE VALVE SHALL BE LEFT HAND OPEN.

TYP. VERTICAL G.V. INSTALLATION

N.T.S.



NOTE:
1. USE PROTECTION RING IN SHOULDER OF ROAD.

VALVE BOX PROTECTION

N.T.S.

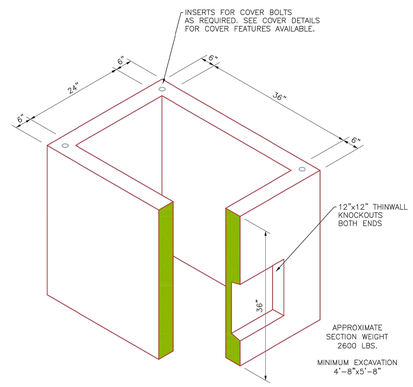
ALL CONCRETE SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 4500 psi.

REINFORCING STEEL SHALL COMPLY WITH ASTM A615 GRADE 60, A706 GRADE 60 OR A497 GRADE 70. BAR BENDING AND PLACEMENT SHALL COMPLY WITH THE LATEST ACI STANDARDS

STANDARD STRUCTURAL DESIGN IS BASED ON AASHTO HS 20 WHEEL LOADING

WATER TABLE IS AT 3'-0" BELOW GRADE FOR STANDARD STRUCTURAL DESIGN

THE STANDARD DESIGN IS BASED ON THE TOP AT FINISHED GRADE ELEVATION.



HANDHOLE WITH THINWALL KNOCKOUTS

NOT TO SCALE

UNC CHARLOTTE

Sciences Building - Existing Building Heating Conversions

9201 University City Boulevard
Charlotte, NC 28223

SCO ID Number: 16-14355-02B
Code: 46626
Item: 301

DESIGNER

CLARKNEXSEN

1523 Elizabeth Avenue, Suite 300
Charlotte, NC 28204
704.377.8800

LandDesign

223 N Graham Street Charlotte, NC 28202
V: 704.333.0325 F: 704.332.3246
www.LandDesign.com

CONSULTANT

SEALS

LANDDESIGN, INC. NORTH CAROLINA SEAL C-0658 REGISTERED LANDSCAPE ARCHITECT

NORTH CAROLINA SEAL 033804 ENGINEER MARC D. MOMSEN

Max Moms Nov 20 2017 5:13 PM

NC Corporate Engineering License #: C-0658

SUBMITTAL

05 November 2017

Bid Documents

REVISIONS

1	11/20/2017	ADDENDUM #1

SHEET

UTILITY DETAILS

C-401

DESIGN: MCM
DRAWN: GR
REVIEW: MCM

CN 6222

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SEISMIC PERFORMANCE CRITERIA (NAT. GAS SYSTEMS)

WHERE APPLICABLE, NATURAL GAS PIPING, EQUIPMENT, AND SERVICES ARE TO BE SEISIMICALLY RESTRAINED IN ACCORDANCE WITH THE 2012 EDITION OF THE NORTH CAROLINA STATE BUILDING CODES, CHAPTER 13 OF ASCE 7, AND AS DIRECTED BY THE BUILDING'S STRUCTURAL ENGINEER OF RECORD. DESIGN OF THE RESTRAINT SYSTEM SHALL BE PERFORMED BY THE MANUFACTURER OF THE RESTRAINT DEVICES. DESIGN OF THE RESTRAINT SYSTEM AND ALL SUBMITTAL DATA TO INCLUDE SEISMIC CALCULATIONS CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NORTH CAROLINA AND EMPLOYED BY THE RESTRAINT MANUFACTURER. SEISMIC RESTRAINT DEVICES TO BE INDEPENDENTLY TESTED TO ENSURE PUBLISHED RATINGS. ALL ASSEMBLIES SHALL HAVE AN ANCHORAGE PRE-APPROVAL "R" NUMBER FROM OSHPD.

ACCEPTABLE MANUFACTURERS:

1) MASON INDUSTRIES, 2) KINETICS NOISE CONTROL, 3) ISOLATION TECHNOLOGY INC., OR APPROVED EQUAL.

SEISMIC PERFORMANCE CRITERIA:

SEISMIC USE GROUP: II
COMPONENT IMPORTANCE FACTOR (Ip): 1.5
SEISMIC DESIGN CATEGORY: C

SEISMIC PERFORMANCE CRITERIA (MECHANICAL SYSTEMS)

BASED ON THE 2012 EDITION OF THE NORTH CAROLINA STATE BUILDING CODES, SECTION 9.6 OF ASCE 7, AND THE FOLLOWING SEISMIC PERFORMANCE CRITERIA, SEISMIC RESTRAINTS FOR THE MECHANICAL EQUIPMENT AND SYSTEMS ARE NOT REQUIRED.

SEISMIC PERFORMANCE CRITERIA:

SEISMIC USE GROUP: II
COMPONENT IMPORTANCE FACTOR (Ip): 1.0
SEISMIC DESIGN CATEGORY: C

LEGEND

Symbol	Description
	CONNECT TO EXISTING
	DEMO TO THIS POINT

PIPING

Symbol	Description
CD	COOLING COIL CONDENSATE DRAIN
HWS	HEATING HOT WATER SUPPLY
HWR	HEATING HOT WATER RETURN
LPS	LOW PRESSURE STEAM
LPC	LOW PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HPC	HIGH PRESSURE CONDENSATE
PC	PUMPED CONDENSATE
(NAME)E	EXISTING PIPING
XX (NAME) XX	PIPING TO BE REMOVED
	ELBOW UP
	TEE DOWN
	TEE UP
	GENERAL PIPELINE STRAINER WITH DRAIN VALVE AND CAP
	FLANGE
	UNION
	PIPE FLEXIBLE CONNECTION
	BUTTERFLY VALVE
	GATE VALVE
	GLOBE VALVE
	BALL VALVE
	GAUGE VALVE
	CALIBRATED BALANCING VALVE
	SPRING CHECK VALVE
	SWING CHECK VALVE
	2-WAY MODULATING CONTROL VALVE
	THERMOMETER IN THERMOWELL
	PRESSURE GAUGE
	FLOW SENSOR
	FLOW SWITCH
	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	THERMOSTATIC AIR VENT
P/T	PRESSURE/TEMPERATURE TEST PLUG (P/T)
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	DIRECTION OF FLOW
	WATER FLOW METER
	PRESSURE RELIEF OR SAFETY VALVE
	PRESSURE REDUCING VALVE

DIRECT BURIED PIPING SPECIFICATION

UNDERGROUND DISTRIBUTION PIPING SHALL BE BY ONE OF THE FOLLOWING MANUFACTURERS: 1)PERMA-PIPE, 2)ROVANCO, 3)THERMACORE. THE BASIS OF DESIGN IS QUICK-THERM, AS MANUFACTURED BY PERMA-PIPE. THE SERVICE PIPE SHALL BE DOMESTIC STEEL ONLY, WITH MILL CERTIFICATION CERTIFICATES DELIVERED WITH THE TRUCK. THE PIPE SHALL BE STANDARD WEIGHT ASTM A53 GRADE B SCHEDULE 40 CARBON STEEL. THE EXTERIOR OF THE CARRIER PIPE SHALL BE FACTORY COATED WITH 2-4 MILS ZINC RICH PAINT TO A SHOT BLASTED NEAR WHITE FINISH PER SSPC -10-63T. ALL JOINTS SHALL BE BUTT-WELDED FOR 2 1/2" AND LARGER, AND SOCKET OR BUTT-WELDED FOR 2" AND SMALLER. WHERE POSSIBLE, STRAIGHT SECTIONS SHALL BE SUPPLIED IN 40-FOOT RANDOM LENGTHS WITH PIPING EXPOSED AT EACH END FOR FIELD JOINT FABRICATION. THE PRE-INSULATED PIPE SUPPLIER SHALL FURNISH A COATING DATA SHEET FROM COATING MANUFACTURER WITH SUBMITTAL.

INSULATION

THE SERVICE PIPE INSULATION SHALL BE POLYURETHANE FOAM WITH 2 LB./FT3 MINIMUM DENSITY, 90% MINIMUM CLOSED CELL CONTENT, MINIMUM COMPRESSIVE STRENGTH OF 40 PSI AND INITIAL THERMAL CONDUCTIVITY OF 0.18 BTU_IN/HR./FT2/OF. THE INSULATION SHALL COMPLETELY FILL THE ANNULAR SPACE BETWEEN THE SERVICE PIPE AND JACKET AND-SHALL BE BONDED TO BOTH. SYSTEMS USING OPEN CELL INSULATION OR A NON- BONDED DESIGN SHALL NOT BE ALLOWED. THE POLYURETHANE FOAM INSULATION SHALL BE TESTED BY THE MANUFACTURER FOR MECHANICAL AND THERMAL TO ASSURE COMPLIANCE WITH THE ABOVE VALUES. ALL TEST SAMPLES WILL BE TAKEN FROM PRODUCTION MATERIAL, IDENTIFIED, TAGGED AND TESTED IN ACCORDANCE WITH THE STANDARDS BELOW. TEST REPORTS SHOWING RESULTS WILL BE FURNISHED TO THE ENGINEER FOR APPROVAL. DATA SUPPLIED BY THE POLYURETHANE FOAM CHEMICAL SUPPLIER IS NOT ACCEPTABLE. THE PIPE INSULATION SHALL HAVE A METALLIC (ALUMINUM) DIFFUSION BARRIER WRAPPED AROUND ALL STRAIGHT SECTIONS OF PIPE PRIOR TO OUTER HDPE JACKET. THERMO LASTIC DIFFUSION BARRIERS WILL NOT BE ALLOWED, ONLY METALLIC (ALUMINUM). MANUFACTURERS THAT CANNOT SUPPLY DIFFUSION BARRIER SHALL PROVIDE AS A MINIMUM SDR 32 HDPE JACKET MATERIAL.

FIELD JOINTS

THE SERVICE PIPE SHALL BE HYDROSTATICALLY TESTED TO 150 PSIG OR 1 1/2 TIMES THE DESIGN PRESSURES WHICHEVER IS GREATER. INSULATION SHALL THEN BE POURED IN PLACE INTO THE FIELD JOINT AREA. ALL FIELD-APPLIED INSULATION SHALL BE PLACED ONLY IN STRAIGHT SECTIONS OF PIPE, AND THEN WRAPPED WITH ALUMINUM DIFFUSION MATERIAL PRIOR TO INSTALLING THE SHRINK WRAP. THE INSTALLER SHALL SEAL THE FIELD JOINT AREA WITH A DUAL SHRINK WRAP SYSTEM OF A 24" WIDE HEAT SHRINKABLE ADHESIVE BACKED SLEEVE OVER LAPPED WITH A 36" WIDE SHRINKABLE ADHESIVE BACKED SLEEVE. BACKFILLING SHALL NOT BEGIN UNTIL THE HEAT SHRINK SLEEVE HAS COOLED TO 100 DEGREES F. ALL INSULATION AND JACKETING MATERIALS FOR THE FIELD JOINT SHALL BE FURNISHED BY MANUFACTURE. ALL FIELD JOINT AREAS MUST BE VISUALLY INSPECTED AFTER FOAMING OF JOINTS TO INSURE THE JOINT AREA IS VOID FREE. NO SLEEVES OR SHRINK-WRAP SHALL BE APPLIED WITHOUT VISUAL INSPECTION.

PROTECTIVE JACKET

THE OUTER CASING PROTECTIVE JACKET SHALL BE EXTRUDED BLACK HIGH-DENSITY POLYETHYLENE (HDPE) PER ASTM D3350. THE JACKET SHALL BE MANUFACTURED TO A MINIMUM THICKNESS OF SDR 32.5. THE JACKET THROUGHOUT THE ENTIRE SYSTEM SHALL INCORPORATE ELECTRIC FUSION, BUTT FUSION, OR EXTRUSION WELDING AT ALL FITTINGS, JOINT CLOSURES OR OTHER POINTS OF CONNECTION PROHIBITING THE INGRESSION OF WATER. JACKETS MADE FROM PVC, TAPE MATERIALS, OR THIN WALLED POLYETHYLENE SHALL NOT BE ALLOWED.

MOISTURE BARRIER END SEALS SHALL BE FACTORY APPLIED, SEALED TO THE JACKET AND CARRIER PIPE. END SEALS SHALL BE CERTIFIED AS HAVING PASSED A 20 FOOT HEAD PRESSURE TEST. END SEALS SHALL BE HIGH TEMPERATURE MASTIC COMPLETELY SEALING THE EXPOSED END OF INSULATION. FIELD APPLIED END SEALS SHALL BE INSTALLED AT ANY FIELD CUT TO THE PIPING BEFORE CONTINUING INSTALLATION.

BEDDING AND BACKFIELD

A 4-INCH LAYER OF SAND OF FINE GRAVEL SHALL BE PLACED AND TAMPED IN THE TRENCH TO PROVIDE UNIFORM BEDDING FOR THE SYSTEM. THE ENTIRE TRENCH SHALL BE EVENLY BACKFIELD WITH SIMILAR MATERIAL AS THE BEDDING IN 6-INCH COMPACTED LAYERS TO MINIMUM HEIGHT OF 6 INCHES ABOVE THE TOP OF THE INSULATED PIPING SYSTEM. THE REMAINING TRENCH SHALL BE EVENLY AND CONTINUOUSLY BACKFILLED IN UNIFORM LAYERS WITH SUITABLE EXCAVATED SOIL.

1

~~BACKFILL~~

PIPING SHALL MEET H-20 HIGHWAY LOADING WITH 24-INCHES OF BACKFILL PROVIDED ON TOP OF PIPE. BEDDING FOR THE PIPE. THE ENTIRE TRENCH WIDTH SHALL BE EVENLY BACKFILLED WITH A SIMILAR MATERIAL AS THE BEDDING IN 6 INCH COMPACTED LAYERS. THE REMAINING TRENCH SHALL BE EVENLY AND CONTINUOUSLY BACKFILLED AND AND COMPACTED IN UNIFORM LAYERS WITH SUITABLE EXCAVATED SOIL.

WARNING TAPE

PROVIDE WARNING TAPE.

FLUSHING:

FLUSHING OF 4-INCH PIPE AND LARGER SHALL UTILIZE HIGH-PRESSURE "HYRDO-JET" PROCESS. COORDINATE THE LIMITATIONS AND REQUIREMENTS OF HYDRO-JET PROCESS WITH THE FLUSHING SUBCONTRACTOR SUCH THAT THE PIPING IS INSTALLED IN A SEQUENCE AND MANNER THAT ALLOWS EVERY SECTION OF NEW PIPE TO BE CLEANED AND FLUSHED. LIMITATIONS MAY INCLUDE MAXIMUM LENGTH OF PIPE SECTION, MAXIMUM NUMBER / AND OR DEGREE OF BENDS IN THE PIPE SECTION, MAXIMUM SLOPE OF THE PIPE SECTION, EQUIPMENT AND EXCAVATION ACCESS REQUIREMENTS, AND THE MINIMUM SIZE OF THE OPENINGS REQUIRED IN THE PIPING TO ALLOW FOR INSERTION AND RETRACTION OF THE CLEANING HEAD.

VALVES:

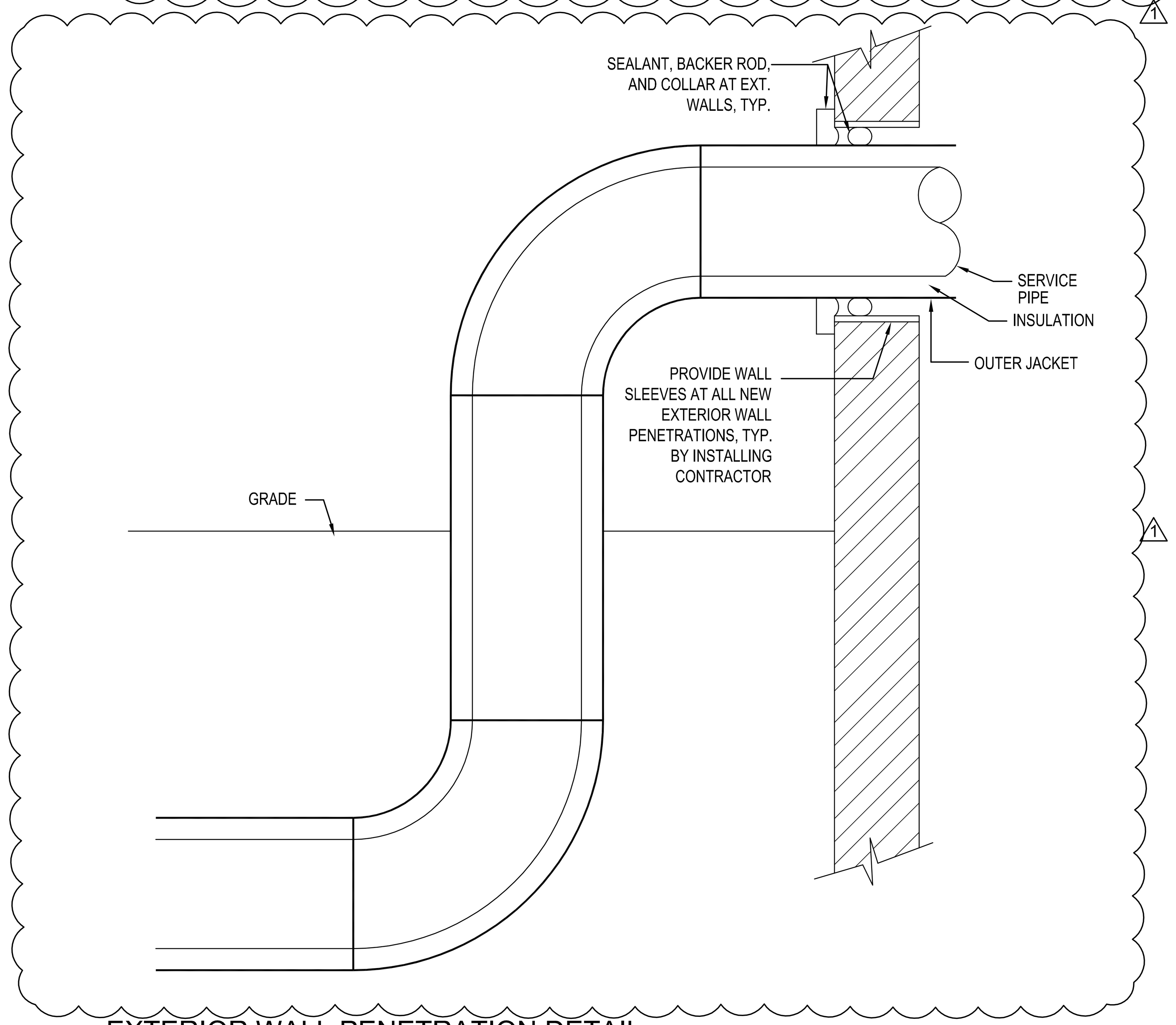
BUTTERFLY VALVES SHALL BE OF THE POSITIVE SHUT-OFF TYPE. ALL WATER VALVES TO OPERATE BY TURNING THE SQUARE NUT CLOCK-WISE (RIGHT) TO CLOSE AND COUTER-CLOCKWISE (LEFT) TO OPEN. PROVIDE ALL VALVES BELOW GRADE WITH EXTENSIONS AND DONUT AND VALVE BOX.

SHOP DRAWINGS:

FOR UNDERGROUND HEATING WATER SUPPLY DISTRIBUTION PIPING. SIGNED AND SEALED BY A QUALIFIED PROFESSIONAL ENGINEER.
1. CALCULATE REQUIREMENTS FOR EXPANSION COMPENSATION FOR UNDERGROUND PIPING.
2. SHOW EXPANSION COMPENSATORS, OFFSETS, AND LOOPS WITH APPROPRIATE MATERIALS TO ALLOW PIPING MOVEMENT IN THE REQUIRED LOCATIONS. SHOW ANCHORS AND GUIDES THAT RESTRAIN PIPING MOVEMENT WITH CALCULATED LOADS, AND SHOW CONCRETE THRUST BLOCK DIMENSIONS.
3. SHOW PIPE SIZES, LOCATIONS, AND ELEVATIONS. SHOW PIPING IN TRENCH WITH DETAILS SHOWING CLEARANCES BETWEEN PIPING, AND SHOW INSULATION THICKNESS.

COORDINATION DRAWINGS: SHOW PIPE SIZES, LOCATIONS, AND ELEVATIONS. SHOW OTHER PIPING IN SAME TRENCH AND CLEARANCES FROM DISTRIBUTION PIPING. INDICATE INTERFACE AND SPATIAL RELATIONSHIP BETWEEN MANHOLES, PIPING, AND PROXIMATE STRUCTURES.
PROFILE DRAWINGS: SHOW SYSTEM PIPING IN ELEVATION. DRAW PROFILES AT HORIZONTAL SCALE OF NOT LESS THAN 1 INCH EQUALS 50 FEET (1:500) AND AT VERTICAL SCALE OF NOT LESS THAN 1 INCH EQUALS 5 FEET (1:50). INDICATE MANHOLES AND PIPING. SHOW TYPES, SIZES, MATERIALS, AND ELEVATIONS OF OTHER UTILITIES CROSSING DISTRIBUTION PIPING.
THE PIPING SYSTEM LAYOUT SHALL BE ANALYZED BY THE PIPING SYSTEM MANUFACTURER TO DETERMINE THE STRESSES AND DISPLACEMENTS OF THE SERVICE PIPE. THE PIPING SYSTEM DESIGN AND MANUFACTURE SHALL BE IN STRICT CONFORMANCE WITH ASME B31.1, LATEST EDITION.

1



EXTERIOR WALL PENETRATION DETAIL
NO SCALE

GENERAL

1. ALL MECHANICAL EQUIPMENT AND INSTALLATIONS SHALL YIELD COMPLETE OPERATIONAL SYSTEMS THAT CONFORM TO THE REQUIREMENTS OF THE APPLICABLE LOCAL ORDINANCES AND CODES INCLUDING BUT NOT LIMITED TO THE NORTH CAROLINA BUILDING CODE, NORTH CAROLINA MECHANICAL CODE. NORTH CAROLINA ENERGY CONSERVATION CODE AND UNDERWRITERS LABORATORIES (OR ETL).
2. THE CONTRACT DOCUMENTS ARE BASED ON EQUIPMENT OF SPECIFIC MANUFACTURERS. IF THE CONTRACTOR SUBMITS OR PROPOSES TO USE EQUIPMENT OTHER THAN THAT USED ON THE CONTRACT DOCUMENTS THEN THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DESIGN AND INSTALLATION REVISIONS AT NO ADDITIONAL COST TO THE PROJECT. REVISIONS INCLUDE BUT ARE NOT LIMITED TO, CHANGES IN EQUIPMENT DIMENSIONS OR WEIGHT, ACCESS REQUIREMENTS, ORIENTATION AND CONNECTIONS, AND ELECTRICAL REQUIREMENTS.
3. EQUIPMENT OF A SIMILAR TYPE SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER.
4. DO NOT SCALE DRAWINGS. DRAWINGS ARE DIAGRAMMATIC.
5. CONTRACTORS ARE TO PREPARE AND SUBMIT COORDINATION DRAWINGS IN ACCORDANCE WITH DIVISON 1 AND SPECIFIC REQUIREMENTS IN SELECTED SECTIONS OF DIVISION 23 OF THE SPECIFICATIONS.
6. INSTALLATION OF PIPING, DUCTWORK, AND EQUIPMENT SHALL NOT BE STARTED PRIOR TO SUBMISSION AND APPROVAL OF THE CONTRACTOR DEVELOPED COORDINATION DRAWINGS THAT INCLUDE, BUT ARE NOT LIMITED TO, SHOWING PLUMBING, FIRE SUPPRESSION, HVAC, ARCHITECTURAL, STRUCTURAL, ELECTRICAL POWER, LIGHTING AND CONTROL AND TELECOM WORK. ANY WORK INSTALLED PRIOR TO THE APPROVAL OF THE COORDINATION DRAWINGS MAY NEED TO BE REMOVED, RELOCATED, OR ADJUSTED WITH NO IMPACT ON THE PROJECT SCHEDULE OR PROJECT COST.
7. SHOP DRAWINGS SHALL BE SUBMITTED TO AND APPROVED BY THE ARCHITECT BEFORE ANY MECHANICAL EQUIPMENT IS ORDERED, PURCHASED, RELEASED, OR FABRICATED. SHOP DRAWINGS AND SUBMITTALS SHALL INCLUDE PRODUCT INFORMATION FOR ALL EQUIPMENT SPECIFIED OR SCHEDULED ON THE DRAWINGS; COORDINATION DRAWINGS SHALL BE COMPLETED AND REVIEWED PRIOR TO THE PURCHASING OF ANY EQUIPMENT.
8. ALL MECHANICAL EQUIPMENT AND MATERIALS SHALL BE INSTALLED ACCORDING TO MANUFACTURERS' RECOMMENDATIONS AND INSTALLATION INSTRUCTIONS USING MANUFACTURER RECOMMENDED ACCESSORIES AND ASSOCIATED MATERIALS.
9. ALL EQUIPMENT AND MATERIALS INSTALLED IN AIR PLENUMS SHALL BE COMPLIANT WITH THE REQUIREMENTS FOR PLENUM INSTALLATIONS.
10. BEFORE THE PROJECT IS CONSIDERED SUBSTANTIALLY COMPLETE, THE ENTIRE HVAC SYSTEM SHALL BE TESTED, ADJUSTED, AND BALANCED IN ACCORDANCE WITH AABC OR NEBB STANDARDS, TO DELIVER THE AIR AND WATER FLOW QUANTITIES SHOWN ON THE DRAWINGS. A CERTIFIED TEST AND BALANCE REPORT SHALL BE SUBMITTED TO, AND APPROVED BY THE ENGINEER. FURNISH AND INSTALL ADJUSTMENT AND BALANCING DEVICES, (DAMPERS, VALVES, AND SHEAVES) AS REQUIRED AT NO ADDITIONAL COST TO THE PROJECT.
11. PERMANENTLY MARK FINAL SETTINGS ON BALANCING DEVICES.
12. ALL MECHANICAL EQUIPMENT AND SYSTEMS SHALL BE GUARANTEED FOR A PERIOD OF TWELVE MONTHS AFTER ACCEPTANCE BY OWNER.
13. FURNISH AND INSTALL DUCTWORK AND PIPE TRANSITIONS REQUIRED AT EQUIPMENT CONNECTIONS.
14. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL MECHANICAL EQUIPMENT, DUCTWORK, ETC. TO FIT WITHIN THE SPACE ALLOWED BY THE ARCHITECTURAL AND STRUCTURAL CONDITIONS. CUTTING OR OTHERWISE ALTERING ANY STRUCTURAL MEMBERS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT.
15. LOCATE ALL EQUIPMENT TO PRODUCE UNOBSTRUCTED ACCESS TO EQUIPMENT ACCESS PANELS, CONTROLS, AND VALVING.
16. FURNISH AND INSTALL ACCESS DOORS AND PANELS IN NON-ACCESSIBLE CEILINGS AND IN WALL STRUCTURES TO YIELD ADEQUATE SPACE FOR MAINTENANCE OF EQUIPMENT AND BALANCING OF SYSTEMS. ACCESS DOORS AND PANELS SHALL BE INSTALLED WHERE SHOWN ON THE DRAWINGS OR AS NECESSARY TO PRODUCE ACCESS TO DAMPERS, VALVES, ETC. COORDINATE EXACT LOCATION OF ALL ACCESS PANELS AND DOORS WITH THE ARCHITECT DURING THE SHOP DRAWING PROCESS.
17. INSTALL ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WHERE THE MANUFACTURER'S RECOMMENDED MINIMUM LENGTHS OF STRAIGHT PIPE ARE PROVIDED UPSTREAM AND DOWNSTREAM OF THE DEVICE.

ELECTRICAL COORDINATION

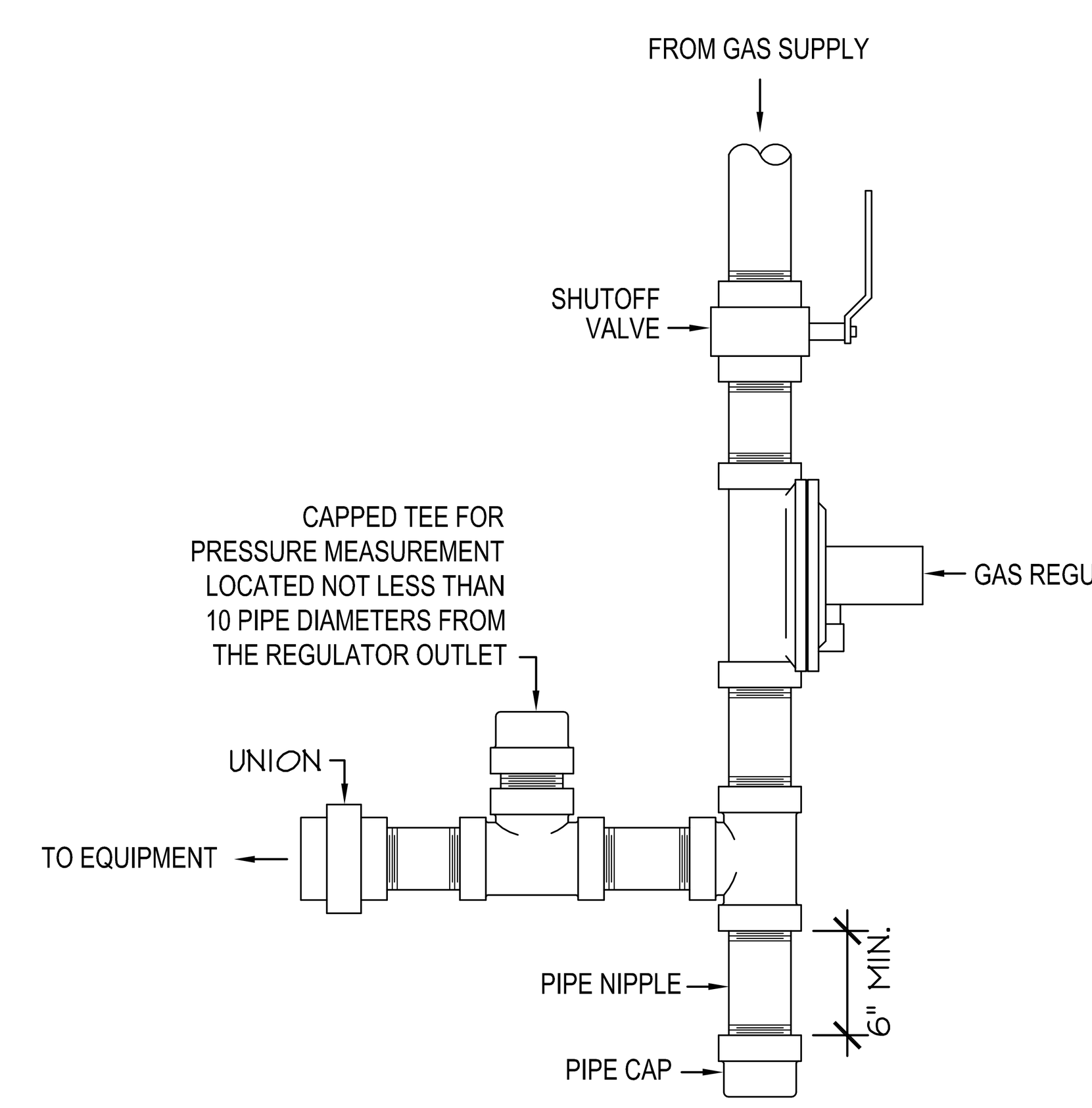
18. CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH THE ELECTRICAL DRAWINGS AND ELECTRICAL CONTRACTOR BEFORE ANY PRODUCT INFORMATION OR SHOP DRAWINGS ARE SUBMITTED AND BEFORE ANY EQUIPMENT IS ORDERED. THE ELECTRICAL CHARACTERISTICS (VOLTAGE, PHASE, OVERLOAD PROTECTION, ETC.) OF THE EQUIPMENT FURNISHED SHALL BE COMPATIBLE WITH THE ELECTRICAL CHARACTERISTICS SHOWN ON THE DRAWINGS. ON SHOP DRAWING SUBMITTALS THE MECHANICAL CONTRACTOR SHALL STATE THAT THE ELECTRICAL CHARACTERISITICS OF ALL EQUIPMENT HAS BEEN COORDINATED WITH THE ELECTRICAL CONTRACT DOCUMENTS AND THE ELECTRICAL CONTRACTOR.
19. ALL MECHANICAL EQUIPMENT REQUIRING ELECTRICAL POWER SHALL BE INSTALLED WITH DISCONNECT SWITCHES AND STARTERS WHETHER THEY ARE AN INTEGRAL COMPONENT OF THE MANUFACTURER'S EQUIPMENT OR NOT. COORDINATE SWITCH TYPE (FUSED OR NON-FUSED) WITH EQUIPMENT CHARACTERISTICS, MANUFACTURER'S RECOMMENDATIONS, ELECTRICAL DRAWINGS, AND ELECTRICAL CONTRACTOR.
20. ALL REQUIRED CONTROL WIRING FOR HVAC AND PLUMBING, INCLUDING POWER WIRING REQUIRED FOR CONTROL PANELS, ACTUATORS, DEVICES, ETC., SHALL BE INCLUDED AS PART OF THE MECHANICAL WORK. WIRING, INCLUDING THAT IN HVAC PLENUM SPACES, SHALL BE INSTALLED ACCORDING TO CODE REQUIREMENTS.
21. UNLESS NOTED OTHERWISE, STARTERS, TRANSFORMERS, CONTROLS, AND CONTROL WIRING REQUIRED FOR ALL MECHANICAL SYSTEMS SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR. SEE ELECTRICAL SPECIFICATIONS FOR WIRING REQUIREMENTS.

PROTECTION OF RATED ASSEMBLIES

22. ALL PIPE PASSING THROUGH FIRE-RATED AND SMOKE-RATED ASSEMBLIES SHALL BE FIRE-STOPPED AS REQUIRED TO PRODUCE A RATED ASSEMBLY. FIRE BARRIER PRODUCTS SHALL BE AS MANUFACTURED BY 3M CO., HILTI INC., OR OTHER APPROVED MANUFACTURER. ACCEPTABLE PRODUCTS ARE HILTI FS-ONE, CP 606, CP648 WRAP STRIP, OR CP680 CAST-IN DEVICE SYSTEMS, OR AS RECOMMENDED BY THE MANUFACTURER FOR A PARTICULAR APPLICATION OR AN EQUIVALENT SYSTEM AS APPROVED BY LOCAL CODE OFFICIALS.

HYDRONIC PIPING AND FLUES

23. SLOPE ALL HORIZONTAL STEAM AND STEAM CONDENSATE PIPING AND GAS FLUE PIPING MINIMUM 1/4-INCHES PER FOOT.
24. INSTALL MANUAL AIR VENTS AT HIGH POINTS OF ALL CIRCULATING WATER PIPING SYSTEMS.
25. PIPING AT PUMPS AND EQUIPMENT SHALL BE SUPPORTED SO THAT NO PIPING OR ACCESSORY LOAD IS CARRIED BY THE PUMP, EQUIPMENT, OR FLEX CONNECTORS.
26. FOR ALL HYDRONIC AND STEAM PIPING, THE MINIMUM PIPE SIZE SHALL BE 3/4-INCHES DIAMETER, LONG RADIUS ELBOWS SHALL BE USED, AND UNLESS INDICATED OTHERWISE, PIPING SHALL BE INSTALLED BENEATH DUCTWORK.
27. PIPING SHALL BE INSTALLED SO THAT ALL VALVES, STRAINERS, TRAPS UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
28. VALVES AND SPECIALTIES SHALL BE LINE SIZE UNLESS INDICATED OTHERWISE. VALVES SHALL BE INSTALLED IN LOCATIONS SO THAT THE VALVES REMAIN IN SERVICE WHEN THE EQUIPMENT OR PIPING IS REMOVED.
29. VALVES SHALL HAVE POSITION INDICATORS. BALANCING VALVES SHALL HAVE ADJUSTABLE MEMORY STOPS.
30. AT EQUIPMENT CONNECTIONS LOCATE PIPING TRANSITIONS BETWEEN EQUIPMENT AND VALVES AND STRAINERS.
31. ALL PIPING ABOVE GRADE SHALL BE SUPPORTED BY THE BUILDING STRUCTURE AND SHALL NOT REST ON CEILING TILES OR THE CEILING SUPPORT STRUCTURE. PIPING HUNG FROM JOISTS SHALL BE HUNG FROM THE TOP CHORDS OF THE JOISTS.
32. ISOLATION VALVES SHALL BE INCLUDED AND INSTALLED IN ALL PIPES CONNECTED TO EACH PIECE OF EQUIPMENT AND PIPING ACCESSORY FOR WHICH MAINTENANCE OR REPLACEMENT OF THE EQUIPMENT OR ACCESSORY WOULD REQUIRE SYSTEM SHUT-DOWN.



GAS APPLIANCE CONNECTION DETAIL
NO SCALE

UNC CHARLOTTE

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CONSULTANT

SEALS

SEAL 034339

SUBMITTAL
20 November 2017
Bid Documents

REVISIONS

1	11/20/17	ADDENDUM #1

SHEET

MECHANICAL LEGENDS AND NOTES

ME001

DESIGN CNE
DRAWN CNE
REVIEW DAC

CN 6222

PANEL TB1 SCHEDULE

800 AMP MCB | 480Y/277 VOLTS | 3PH, 4W, SN | MIN. 35 KAIC | SURFACE MOUNTED | SE RATED | NEMA 3R

CKT. NO.	LOAD DESCRIPTION	COND SIZE	WIRE SIZE	BKR TRIP	AMPS	KVA	PH	KVA	AMPS	BKR TRIP	WIRE SIZE	COND SIZE	LOAD DESCRIPTION	CKT. NO.
1	PBR-1	1-1/2	1	125	95.0	26.3	A	21.3	77.0	125	1	1-1/2	P-7	2
					95.0	26.3	B	21.3	77.0					
3	PBR-2	1-1/2	1	125	95.0	26.3	C	21.3	77.0	125	1	1-1/2	P-8	4
					95.0	26.3	A	21.3	77.0					
5	EUH-1	3/4	12	15	95.0	26.3	B	21.3	77.0					
					4.0	1.1	C						BUSSED SPACE	6
7	BUSSED SPACE				4.0	1.1	A							
							B						BUSSED SPACE	8
9	BUSSED SPACE						C							
							A						BUSSED SPACE	10
							B							
							C							

TOTAL AMPS (CONN. LOAD): A: 348.1 B: 348.1 C: 348.1
TOTAL AMPS (FEEDTHRU): A: B: C:
TOTAL AMPS (CONN. LOAD + FEED-THRU): A: 348.1 B: 348.1 C: 348.1

PANEL 05HM2 SCHEDULE

100 AMP MLO | 480Y/277 VOLTS | 3PH, 4W, SN | MIN. 35 KAIC | SURFACE MOUNTED

CKT. NO.	LOAD DESCRIPTION	COND SIZE	WIRE SIZE	BKR TRIP	AMPS	KVA	PH	KVA	AMPS	BKR TRIP	WIRE SIZE	COND SIZE	LOAD DESCRIPTION	CKT. NO.
1	P-1	3/4	12	15	4.8	1.3	A						BUSSED SPACE	2
3					4.8	1.3	B						BUSSED SPACE	4
5					4.8	1.3	C						BUSSED SPACE	6
7	P-2	3/4	12	15	4.8	1.3	A						BUSSED SPACE	8
9					4.8	1.3	B						BUSSED SPACE	10
11					4.8	1.3	C						BUSSED SPACE	12
13	P-3	3/4	12	20	11.0	3.0	A						BUSSED SPACE	14
15					11.0	3.0	B						BUSSED SPACE	16
17					11.0	3.0	C						BUSSED SPACE	18
19	P-4	3/4	12	20	11.0	3.0	A						BUSSED SPACE	20
21					11.0	3.0	B						BUSSED SPACE	22
23					11.0	3.0	C						BUSSED SPACE	24
25	BUSSED SPACE						A						BUSSED SPACE	26
27	BUSSED SPACE						B						BUSSED SPACE	28
29	BUSSED SPACE						C						BUSSED SPACE	30

TOTAL AMPS (CONN. LOAD): A: 31.6 B: 31.6 C: 31.6
TOTAL AMPS (FEEDTHRU): A: B: C:
TOTAL AMPS (CONN. LOAD + FEED-THRU): A: 31.6 B: 31.6 C: 31.6

EXISTING PANEL DATA

BUILDING	PANEL NAME	VOLTAGE	MANUFACTURER	TYPE
CAMERON	BP	208Y/120V	WESTINGHOUSE	POW-R-LINE C, PRL1
FRIDAY	M	208Y/120V	WESTINGHOUSE	B10B
MCENIRY	LMC	208Y/120V	SQUARE D	NQOD
SMITH	R125	208Y/120V	SQUARE D	NQ
	MSB	480Y/277V	SQUARE D	QED2 SWITCHBOARD

EQUIPMENT CONNECTION SCHEDULE

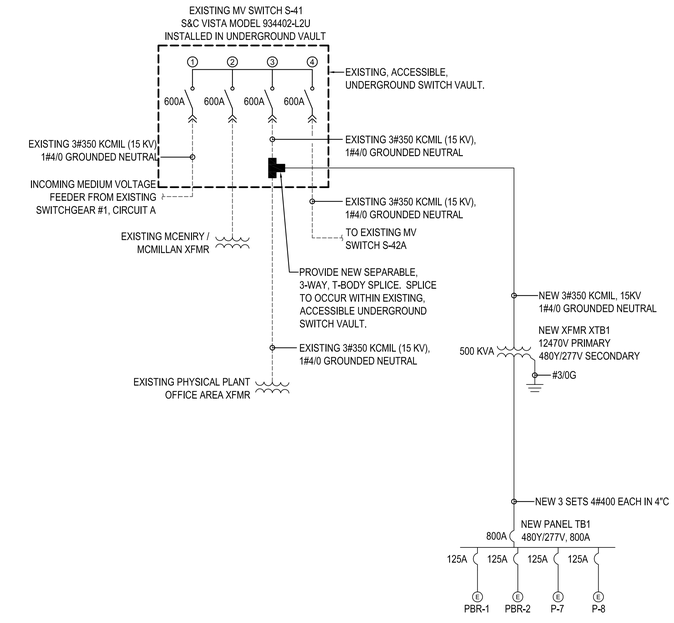
EQUIPMENT DESIGNATION			EQUIPMENT RATINGS						STARTER	DISCONNECT DATA (NOTE 1)		
TAG	DESCRIPTION	LOCATION	HP / WATTS	VOLT	PH	FLA	KVA	OCPD	TYPE	TYPE	RATING	OCPD
PBR-1	PORTABLE BOILER ROOM	EXTERIOR (SEE SITE PLAN)	---	480	3	95.0	78.98	125	---	MANUF	MANUF	MANUF
PBR-2	PORTABLE BOILER ROOM	EXTERIOR (SEE SITE PLAN)	---	480	3	95.0	78.98	125	---	MANUF	MANUF	MANUF
P-7	BOILER PUMP	EXTERIOR (SEE SITE PLAN)	60 HP	480	3	77.0	64.02	125	VFD	MANUF	MANUF	MANUF
P-8	BOILER PUMP	EXTERIOR (SEE SITE PLAN)	60 HP	480	3	77.0	64.02	125	VFD	MANUF	MANUF	MANUF
P-1	LEAD/STANDBY IN-LINE CENTRIFUGAL PUMP	SMITH (SEE PLANS)	3 HP	480	3	4.8	3.99	15	CTLR	MANUF	MANUF	MANUF
P-2	LEAD/STANDBY IN-LINE CENTRIFUGAL PUMP	SMITH (SEE PLANS)	3 HP	480	3	4.8	3.99	15	CTLR	MANUF	MANUF	MANUF
P-3	LEAD/STANDBY IN-LINE CENTRIFUGAL PUMP	SMITH (SEE PLANS)	7.5 HP	480	3	11.0	9.15	20	CTLR	MANUF	MANUF	MANUF
P-4	LEAD/STANDBY IN-LINE CENTRIFUGAL PUMP	SMITH (SEE PLANS)	7.5 HP	480	3	11.0	9.15	20	CTLR	MANUF	MANUF	MANUF
EUH-1	ELECTRIC UNIT HEATER	PUMP HOUSE TRAILER	3.3 KW	480	3	4.0	3.30	15	MRS	MANUF	MANUF	MANUF

SCHEDULE ABBREVIATIONS

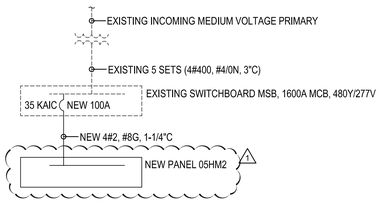
MANUF. PROVIDE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION | MRS MOTOR RATED SWITCH | OCPD OVERCURRENT PROTECTIVE DEVICE
VFD VARIABLE FREQUENCY DRIVE | CTLR LEAD/STANDBY PUMP CONTROLLER

SCHEDULE NOTES:

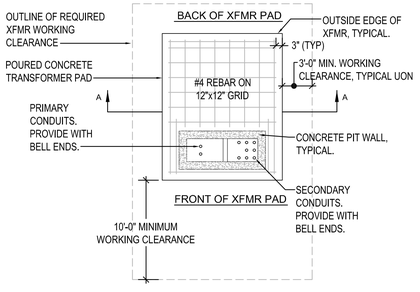
1. EQUIPMENT DISCONNECTS SHALL BE PROVIDED AND INSTALLED WITHIN SIGHT OF EQUIPMENT SERVED BY DISCONNECT SWITCH. SEE DETAIL 3 ON SHEET ME001 FOR ADDITIONAL INSTRUCTIONS.



4 SINGLE-LINE MV AND 600V POWER DISTRIBUTION DIAGRAM
NO SCALE



6 PARTIAL SINGLE-LINE DIAGRAM - SMITH BUILDING
NO SCALE



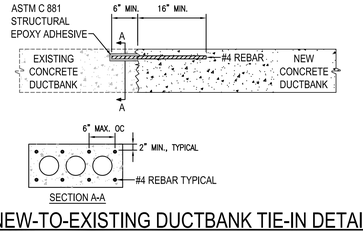
TRANSFORMER PAD - PLAN VIEW

TRANSFORMER PAD - SECTION A-A VIEW

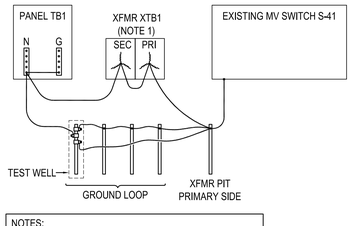
TRANSFORMER PAD NOTES

1. TRANSFORMER PADS SHALL BE INSTALLED IN A LOCATION TO REMAIN READILY ACCESSIBLE FOR LINE TRUCKS.
2. SOIL UNDERNEATH PADS SHALL BE FREE OF ROOTS AND OTHER ORGANIC MATERIALS AND BE THOROUGHLY TAMPED TO PREVENT WASHING. EXERCISE CARE IN BACKFILLING AND GRADING AROUND PAD.
3. REINFORCE WITH #4 REBARS ON A 12" x 12" GRID TIED SECURELY 3" ABOVE BASE ON CLEAN CONCRETE OR BRICK SUPPORTS. END OF REBARS TO BE 3" FROM OUTSIDE EDGE OF PAD.
4. CONCRETE TO BE S-1/2% AIR-ENTRAINED WITH A MINIMUM 28 DAY STRENGTH OF 3000 PSI. MIXTURE TO BE 1:2:4 PROPORTIONS OF CEMENT, SAND AND GRAVEL. USE NO MORE THAN 6 GALLONS OF WATER PER SACK OF CONCRETE.
5. TOP SURFACE TO BE LEVEL SMOOTH AND BEVELED APPROXIMATELY 3/8".
6. SERVICE CONDUIT SHALL BE LOCATED IN THE EXTREME RIGHT SIDE OF THE SECONDARY COMPARTMENT.
7. FOR SPECIAL CIRCUMSTANCES CONTACT THE UNIVERSITY'S ELECTRICAL DEPARTMENT MANAGER.
8. ACTUAL PAD DIMENSIONS VARY BY MANUFACTURER. CONTRACTOR SHALL COORDINATE REQUIRED PAD DIMENSIONS WITH MANUFACTURER OF TRANSFORMER PROVIDED.
9. PAD SHALL EXTEND 6" BEYOND FOOTPRINT OF TRANSFORMER PROVIDED.

3 SERVICE TRANSFORMER PAD DETAIL
NO SCALE



5 NEW-TO-EXISTING DUCTBANK TIE-IN DETAIL
NO SCALE

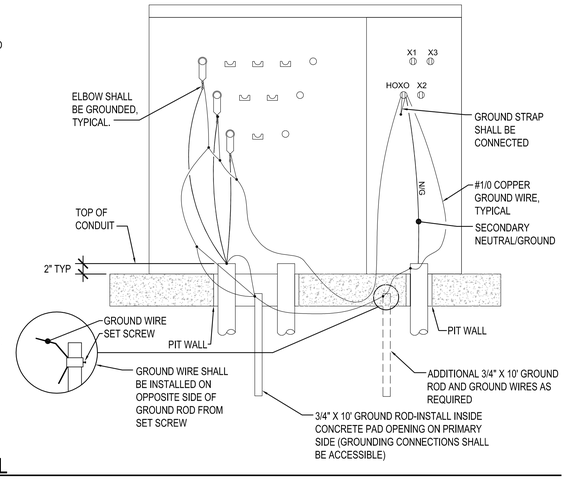


NOTES:
1. SEE DETAIL 1 ON THIS SHEET FOR ADDITIONAL REQUIREMENTS AT TRANSFORMER XTB1.

2 SERVICE GROUNDING DETAIL - PORTABLE BOILER ROOMS
NO SCALE

SERVICE XFMR GROUNDING NOTES:

1. THE PRIMARY NEUTRAL CONDUCTOR SHALL BE BONDED CONTINUOUSLY TO THE PRIMARY CONDUIT (IF METALLIC), THE GROUND ROD, THE XFMR TANK GROUND PAD IN THE PRIMARY COMPARTMENT, AND THE HO/XO NEUTRAL BUSHING.
2. THE ELBOWS AND THE PRIMARY CABLE SHIELD SHALL BE GROUNDED TO THE NEUTRAL CONDUCTOR.
3. A #4 COPPER GROUND WIRE SHALL BE BONDED TO THE HO/XO BUSHING, TO THE GROUND PAD IN THE SECONDARY COMPARTMENT, TO THE SECONDARY CONDUIT (IF METALLIC), AND TO THE GROUND ROD.
4. GROUND STRAP MUST CONNECT THE HO/XO BUSHING TO THE TRANSFORMER TANK.
5. A SUITABLE FLEXIBLE #6 COPPER ARRESTER LEAD SHALL BE INSTALLED FROM EACH ARRESTER DIRECTLY TO THE GROUND ROD (NOT SHOWN).
6. THE PRIMARY AND SECONDARY CONDUITS SHALL EXTEND TWELVE INCHES ABOVE FINISHED GRADE IN PIT.
7. IF THE RESISTANCE OF THE GROUND ROD EXCEEDS 5 OHMS, INSTALL AN ADDITIONAL GROUND ROD AT LEAST 10' AWAY. INTERCONNECT THE TWO USING #4 COPPER GROUND WIRE.
8. COMPLETE INSTALLATION SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE, ANSI C2.
9. PERFORM ALL TERMINATIONS, CONNECTIONS AND GROUNDING IN THE PAD AND PROVIDE GROUND RODS.



1 SERVICE XFMR GROUNDING DETAIL
NO SCALE

UNC CHARLOTTE

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NC Corporate Engineering License #: C-1028

CONSULTANT

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NORTH CAROLINA PROFESSIONAL ENGINEER 11-20-17 SEAL 028911 PHILLIP D. PHILLIPS

SUBMITTAL

20 November 2017

Bid Documents

REVISIONS

1	11/20/17	ADDENDUM #1

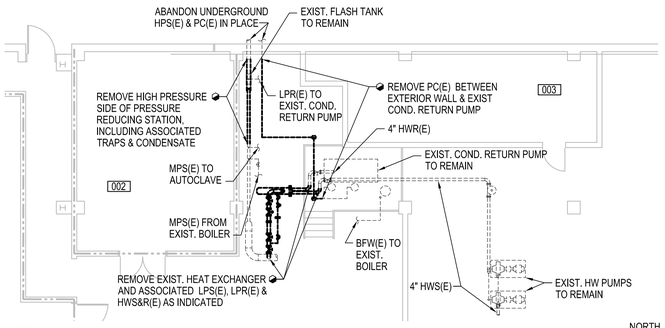
SHEET

ELECTRICAL SCHEDULES AND DETAILS

ME006

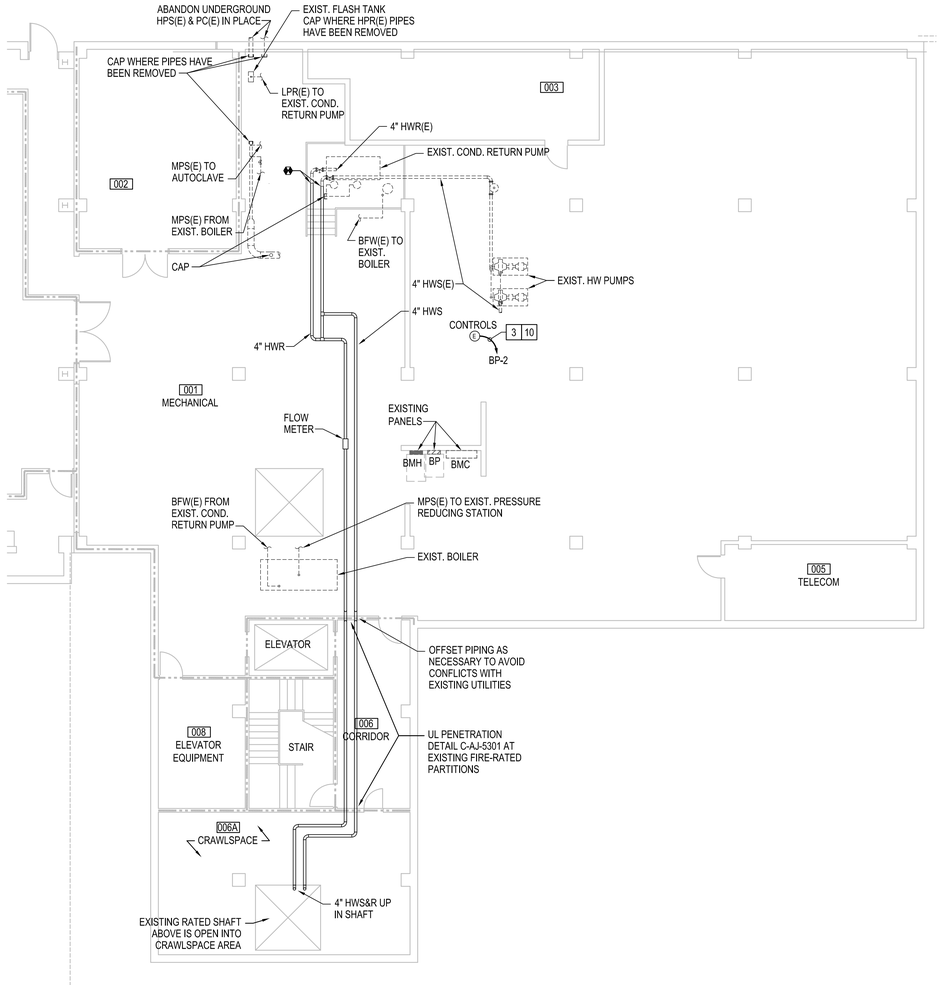
DESIGN: -
DRAWN: -
REVIEW: -

CN 6222



3 CAMERON BASEMEMT MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"

1 CAMERON GROUND FLOOR MECHANICAL PLAN
1/8" = 1'-0"



2 CAMERON BASEMENT MECHANICAL PLAN
1/8" = 1'-0"

GENERAL NOTES

1. COORDINATE LOCATIONS OF EQUIPMENT CONNECTIONS FOR CONTROLS AND MECHANICAL EQUIPMENT WITH CONTRACTOR(S) RESPONSIBLE FOR PROVIDING CORRESPONDING CONTROLS AND MECHANICAL EQUIPMENT.
2. WHERE NEW CIRCUIT BREAKERS ARE INDICATED TO BE INSTALLED IN EXISTING PANELBOARDS, NEW CIRCUIT BREAKER KAIC RATING SHALL BE PROVIDED TO MATCH KAIC RATING OF EXISTING PANEL.

TAGGED NOTES (ALL NOTES MAY NOT BE USED ON ALL DRAWINGS)

1. UTILIZE EXISTING MCC BUCKET NOTED AND PROVIDE NEW FUSING PER EQUIPMENT CONNECTION SCHEDULE ON SHEET ME006. RELABEL BUCKET TO MATCH NEW EQUIPMENT DESIGNATION.
2. REMOVE DISCONNECT SERVING EXISTING PUMP CONTROLLER BEING REMOVED.
3. 120V, 1-PHASE, 20A BRANCH CIRCUIT FOR CONTROLS.
4. VIA PUMP CONTROLLER.
5. BRANCH CIRCUIT FOR PUMP ASSEMBLY.
6. BRANCH CIRCUIT FOR BOILER COMBUSTION AIR FAN.
7. BRANCH CIRCUIT FOR PUMP VFD'S.
8. BRANCH CIRCUIT FOR BOILER PUMPS.
9. REMOVE EXISTING CIRCUIT BREAKER(S) IN EXISTING PANEL POLE SPACES INDICATED. PROVIDE NEW CIRCUIT BREAKER.
10. UTILIZE EXISTING SPARE CIRCUIT BREAKER IN EXISTING PANEL INDICATED.
11. PROVIDE NEW CIRCUIT BREAKER IN EXISTING (OR NEWLY CREATED) PANEL POLE SPACES INDICATED.
12. REMOVE EXISTING BRANCH CIRCUIT WIRING BACK TO LAST ACTIVE DEVICE. EXISTING RACEWAY MAY BE REUSED AT CONTRACTOR'S DISCRETION. OTHERWISE PROVIDE NEW RACEWAY. EXISTING RACEWAY THAT IS NOT REUSED SHALL BE REMOVED AND DISPOSED OF.
13. BRANCH CIRCUIT FOR UNIT HEATER.
14. BRANCH CIRCUIT FOR SUPPLY FAN.
15. PROVIDE CHANNEL STRUT SUPPORT FRAME FOR MOUNTING PANEL 05HM2.
16. BOTTOM OF WALL PENETRATION TO BE LOCATED AT A MAXIMUM OF 48" BELOW EXTERIOR GRADE. SPACING OF PIPE PENETRATIONS IS TO BE 40" O.C. MIN. ONLY ONE VERTICAL BAR IN WALL MAY BE CUT AT EACH PENETRATION. LOCATE BARS USING A NON-DESTRUCTIVE SCANNING METHOD.

THE PROJECT SCOPE FOR CAMERON INCLUDES THE FOLLOWING:

THE BUILDING IS CURRENTLY FED FROM A CAMPUS HIGH PRESSURE STEAM PIPE THAT IS REDUCED VIA A PRESSURE REDUCING STATION WITHIN THE MECHANICAL ROOM. THE STEAM GOES THROUGH A STEAM-TO-WATER CONVERTER WITH HEATING WATER AS THE HEATING MEANS FOR THE BUILDING. EXISTING HEATING WATER PUMP(S) DISTRIBUTE HEATING WATER THROUGHOUT THE BUILDING.

NEW HEATING WATER SUPPLY AND RETURN PIPES SHALL BE PROVIDED AND FED FROM THE TEMPORARY HEATING SYSTEM AND IN THE FUTURE FED FROM RUP 5.

THE PROJECT SCOPE INCLUDES THE FOLLOWING:

1. A PRE-CONSTRUCTION TEST AND BALANCE SHALL BE CONDUCTED TO MEASURE AND RECORD THE HEATING WATER FLOW RATE OF THE EXISTING HEATING WATER PUMP(S). THE FLOW RATE SHALL BE USED AS A FLOW RATE CONTROL SET-POINT AS DESCRIBED IN THE CAMERON CONTROLS DRAWING.

2. REMOVE EXISTING HEATING EQUIPMENT WITHIN THE MECHANICAL ROOM THAT IS CURRENTLY FED FROM THE EXISTING REGIONAL HEATING PLANT THAT IS BEING DEMOLISHED IN THE FUTURE. HEATING EQUIPMENT TO BE REMOVED INCLUDES STEAM PIPING, THE HIGH PRESSURE SIDE OF THE EXISTING PRESSURE REDUCING STATION, AND A STEAM-TO-WATER CONVERTER AS INDICATED ON THE FLOOR PLANS, AND THE HEATING WATER EXPANSION TANK. THE EXISTING AIR SEPARATOR, MEDIUM AND LOW PRESSURE SIDE OF THE PRESSURE REDUCING STATION, CONDENSATE PUMP AND STEAM CONDENSATE PIPING SHALL REMAIN.

3. CONNECT HEATING WATER SUPPLY AND RETURN PIPING TO THE EXISTING HEATING WATER SUPPLY AND RETURN PIPE MAINS AS INDICATED ON THE FLOOR PLAN. PROVIDE PIPING BRIDGE AND CONTROL AS DESCRIBED IN THE CONTROL DRAWINGS.

CONTROLS SCOPE OF WORK:

SEE CONTROL DRAWING FOR CONTROL REQUIREMENTS.

LEGENDS

- TWO-HOUR RATED WALL
- ONE-HOUR RATED WALL
- EXISTING CONSTRUCTION
- ITEMS TO REMOVE
- ITEMS TO REMAIN
- NEW ITEMS

1/8" = 1'-0" 0 5' 10' 15' 30'

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NORTH CAROLINA PROFESSIONAL SEAL 034339 ENGINEER DAVID A. CLARK 11/20/17

SUBMITTAL

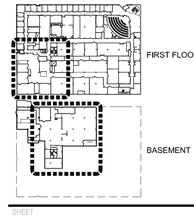
20 November 2017

Bid Documents

REVISIONS

1	11/20/17	ADDENDUM #1

KEYPLAN



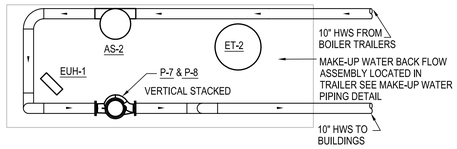
SHEET

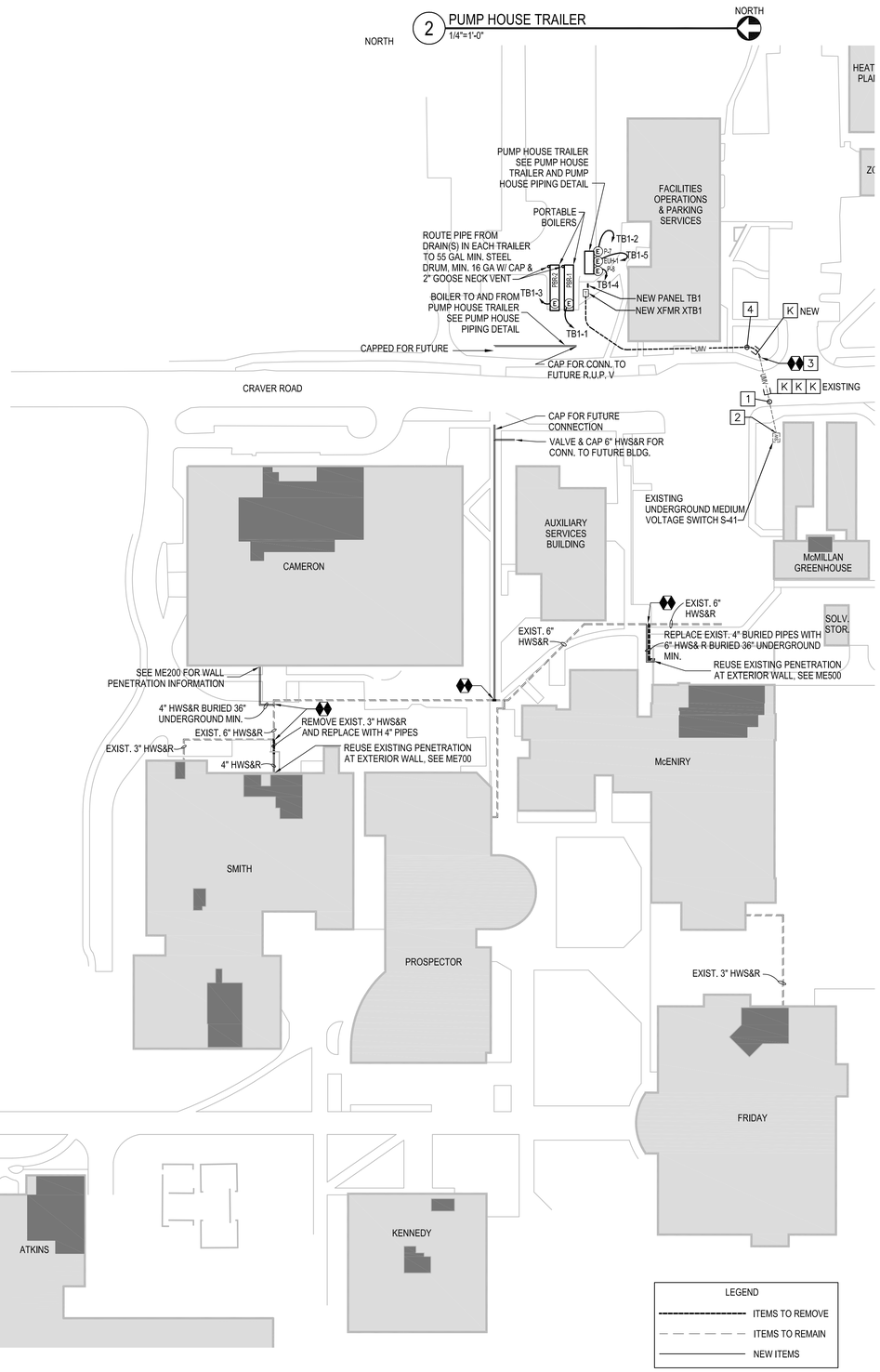
CAMERON MECHANICAL - ELECTRICAL PLANS

ME200

DESIGN CNE
DRAWN CNE
REVIEW DAC

CN 6222

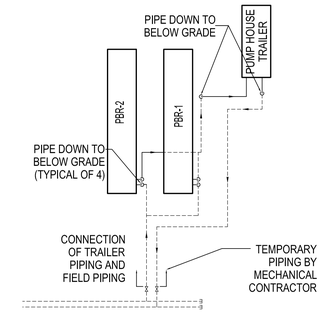




1 MECHANICAL AND ELECTRICAL SITE PLAN
1" = 50'-0"

DUCTBANK CONDUIT SCHEDULE

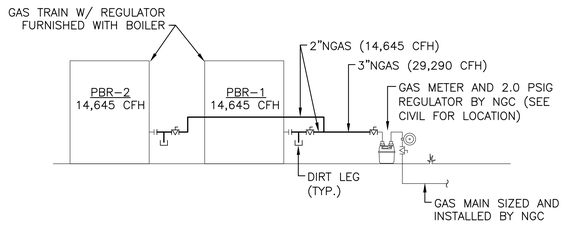
TAG	DESCRIPTION	NOTES
K	15 KV 4" WAY	SEE SINGLE-LINE DIAGRAM ON SHEET ME002 FOR EQUIPMENT RATINGS, CONDUIT SIZES AND CONDUCTOR SIZES.



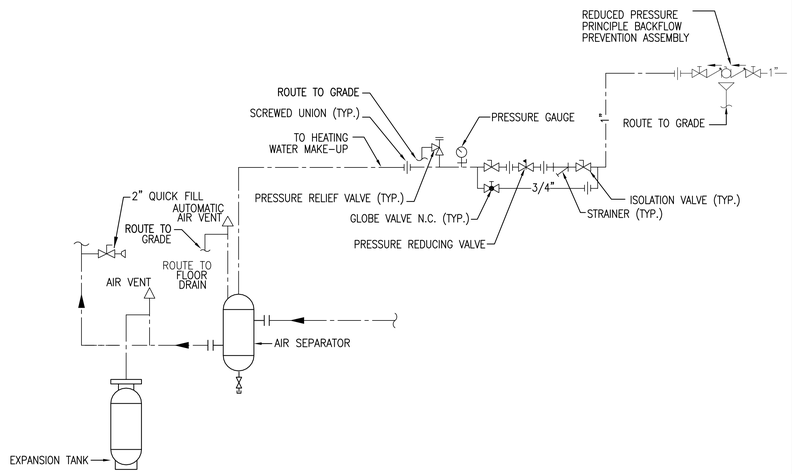
3 PUMP HOUSE TRAILER PIPING DETAIL
NO SCALE

NOTES:

1. CONNECTED LOAD: 29,290 CFH @ 2.0 PSIG SUPPLY
2. APPROXIMATE TOTAL DEVELOPED LENGTH = 40 LF.
3. PIPE SIZES WERE BASED ON THE SIZING CRITERIA FOR SCHEDULE 40 STANDARD STEEL PIPE WITH A PRESSURE DROP OF 1.0 PSIG.
4. BOND GAS PIPING IN ACCORDANCE WITH THE NEC.



TEMPORARY BOILER GAS RISER DIAGRAM
NO SCALE



NOTE: PRESSURE REDUCING VALVE SETTING, IN FEET WATER COLUMN, TO BE EQUAL TO 12 FEET WATER COLUMN PLUS THE ELEVATION DIFFERENCE, IN FEET, BETWEEN THE VALVE AND THE HIGHEST POINT OF THE HYDRONIC SYSTEM IT SERVES

MAKE-UP WATER PIPING DETAIL
NO SCALE

GENERAL NOTES

1. CONTRACTOR TO EXERCISE CAUTION WHEN EXCAVATING NEW ELECTRICAL UNDERGROUND INSTALLATION TO AVOID DAMAGING EXISTING UNDERGROUND UTILITIES. COORDINATE WITH UNC CHARLOTTE PRIOR TO DIGGING. DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED AT CONTRACTOR EXPENSE.

TAGGED NOTES

1. EXISTING CONCRETE ENCASED DUCTBANK WITH (3) 4-INCH DUCTS. COORDINATE WITH UNC CHARLOTTE HIGH VOLTAGE DEPARTMENT FOR LOCATION OF DUCTBANK TERMINATION POINTS AT EACH END.
2. EXISTING DUCTBANK TERMINATED BELOW GRADE OUTSIDE EXISTING SWITCH VAULT. EXTEND DUCTBANK TO EXISTING UNDERGROUND MEDIUM VOLTAGE SWITCH VAULT.
3. EXISTING DUCTBANK TERMINATED BELOW GRADE AT THIS APPROXIMATE LOCATION. TIE NEW DUCTBANK INTO EXISTING DUCTBANK. UTILIZE ONE EXISTING 4-INCH CONDUIT FROM SWITCH VAULT. OTHER EXISTING CONDUITS TO BE CAPPED AND ABANDONED. SEE DETAIL 5 ON SHEET ME006 FOR NEW-TO-EXISTING DUCTBANK TIE-IN REQUIREMENTS.
4. EXTEND NEW DUCTBANK TO NEW TRANSFORMER XTB1.

SCOPE OF WORK

THE SCOPE OF WORK INCLUDES PROVIDING A TEMPORARY HEATING SYSTEM TO SERVE EXISTING BUILDINGS THAT WILL BE FED FROM A NEW HEATING WATER REGIONAL UTILITY PLANT (RUP 5) IN THE FUTURE THE EXISTING HEATING PLANT THAT SERVES THE EXISTING BUILDINGS IS BEING DEMOLISHED TO ACCOMMODATE A NEW SCIENCE BUILDING.

THE TEMPORARY HEATING SYSTEM SHALL BE COMPRISED OF TWO ON-SITE TRAILERS EACH CONTAINING A GAS FIRED BOILER, AND MAEK-UP WATER CONNECTION IN THE PUMP HOUSE WILL BE AN AIR SEPARATOR, AN EXPANSION TANK, TWO VARIABLE FLOW DISTRIBUTION PUMPS.

THE SCOPE OF WORK ALSO INCLUDES THE CONVERSION OF SOME BUILDINGS FROM STEAM TO HEATING WATER.

UNC CHARLOTTE

Sciences Building - Existing Building Heating Conversions

9201 University City Boulevard
Charlotte, NC 28223

SCO ID Number: 16-14355-02B
Code: 46626
Item: 301

DESIGNER

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CONSULTANT

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NORTH CAROLINA PROFESSIONAL SEAL 034339 ENGINEER CHRISTOPHER A. CAIN 11/20/17

SUBMITTAL

20 November 2017

Bid Documents

REVISIONS

1	11/20/17	ADDENDUM #1

SHEET

MECHANICAL-ELECTRICAL SITE PLAN & DETAILS

MES01

DESIGN: CNE
DRAWN: CNE
REVIEW: DAC

CN 6222