STORMWATER MAINTENANCE PLAN

for

University Center Phase 2 Addition and Renovation
Seton Hall University
Township of South Orange Village
Essex County, New Jersey

Prepared For:

Seton Hall University
400 South Orange Avenue
South Orange, New Jersey 07079

Prepared By:

Langan Engineering and Environmental Services, Inc.
300 Kimball Drive
Parsippany, New Jersey 07054

Leonard D. Savino, P.E
NJ Professional Engineer License No. 39238

17 December 2020
Langan Project No. 100898001

LANGAN

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I. INTRODUCTION

The New Jersey Administrative Code NJAC 7:8-5.8 entitled "Maintenance Requirements" sets forth rules and refers to the New Jersey Stormwater Best Practices Manual (the BMP manual) dated February 2004 by the New Jersey Department of Environmental Protection (NJDEP). Chapter 8 of the BMP manual entitled "Maintenance and Retrofit of Stormwater Management Measures" specifically addresses the requirements for maintenance of a major development. Major development is defined in the aforementioned administrative code as any development that provides for ultimately disturbing one or more acres of land or increasing the amount of impervious surface by one quarter of an acre or more. This report was prepared to address the maintenance component of the herein described development to ensure the effective, efficient, and enduring service of the associated stormwater measures. This plan contains preventative and corrective maintenance tasks and procedures.

The party responsible for the preventative and corrective maintenance of the stormwater measures described herein is:

Seton Hall University
c/o Victoria Pivovarnick
Facilities Engineering Department
400 South Orange Avenue
South Orange, New Jersey 07079
Telephone number: (973) 761-9454

II. PROJECT DESCRIPTION

The proposed development of the subject property will consist of selective demolition of portions of the existing University Center building, including their associated site and utility infrastructure. The development also includes the construction of three new additions to the University Center including the northern lower level addition (Constructed in 2018), the western façade and entry addition, and the eastern entry addition. Other construction will include site infrastructure within the disturbed area, including reconstructing sidewalks and landscaping. The University Center will also require multiple utility relocations as well as new below-grade utilities to support the building additions, including stormwater conveyance sewers, detention basins, sanitary sewers, water mains, electric and telecommunications conduit and steam lines.

Proposed utilities will also include the extension and interconnection of the existing network of water mains within the site; new sanitary sewers, which will connect to the existing sanitary sewer system on-site; and a new storm sewer system on-site, which will be connected to new storm detention basins under the landscaped area to the north of the University Center and near the eastern entry addition. The on-site stormwater management and conveyance systems have been designed in accordance with the Township of South Orange Village Stormwater Control Ordinance and the Stormwater Management Regulations issued by the New Jersey Department of Environmental Protection (NJDEP).

The proposed development will include a system of catch basins, manholes, underground

conveyance pipes to collect and convey the stormwater to the proposed subsurface detention basins.

III. STORMWATER MAINTENANCE OBJECTIVE

The stormwater systems proposed for this development are intended to attenuate and convey the stormwater from the development. This maintenance plan is prepared to ensure the systems in place are operating efficiently and reliably. The responsible party shall ensure the long-term/perpetual operation, maintenance, repair, and safety of the stormwater management facilities. In the event that the stormwater management conveyance system becomes a danger to public safety or public health, or if it is in need of maintenance, the municipality shall so notify the responsible person in writing. If for reasons of safety there is need for immediate action, the responsible person shall act forthwith to remove the danger.

Maintenance procedures are required to maintain the intended operation and safe condition of the stormwater management facility by reducing the occurrence of problems and malfunctions. To be effective, maintenance shall be performed on a regular basis and include such routine procedures as training of staff, periodic inspections, silt and debris removal and disposal, control of mosquitoes and other insects, and review of maintenance and inspection work to identify where the maintenance program could be more effective. The required inspections are to be conducted only by properly trained individuals, including confined space entry training and certification. As per N.J.A.C. 7:8-5.8(f), the person responsible for maintenance shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders. The person with maintenance responsibility must retain and, upon request, make available the maintenance plan and associated logs and other records for review by a public entity with administrative, health, environmental, or safety authority over the site.

Repair procedures are required to correct a problem or malfunction at a stormwater management facility and to restore the facility's intended operation and safe condition. Based upon the severity of the problem, repairs shall be performed on an as-needed or emergency basis and may include such procedures as structural repairs, mosquito control, removal of debris, sediment and trash which threaten discharge capacity, erosion repair, snow and ice removal and restoration of vegetation.

In the event that the stormwater management conveyance system becomes a danger to public safety or public health, or if it is in need of maintenance, the municipality may notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to initiate maintenance and repair of the system in a manner that is approved by the municipal engineer or his designee. If the responsible person fails or refuses to perform such maintenance and repair, the municipality may immediately proceed to do so and shall bill the cost thereof to the responsible person.

IV. MAINTENANCE OF CONVEYANCE SYSTEMS

The proposed conveyance systems have adequate access for inspection and/or maintenance. The use of the proposed conveyance systems is necessary to manage runoff and is consistent with the community's surroundings for this area.

All conveyance systems including inlets, manholes and pipes are expected to receive and/or accumulate debris and sediment. These systems must be inspected quarterly for clogging, excessive debris and sediment accumulation as well as after every storm exceeding one inch of rainfall. Sediment removal should take place when all runoff has drained from the conveyance network and the systems are reasonably dry. Disposal of debris, trash, sediment, and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state, and federal waste regulations.

All structural components must be inspected quarterly for cracking, subsidence, breaching, wearing, and deterioration. The condition of surrounding and above lying materials shall be inspected for evidence of potential failures or deterioration.

Maintenance of the conveyance system would require a minimum of two people. The routine equipment expected to be utilized for the maintenance tasks may include a jet vacuum vehicle, shovels, lighting equipment and a wheel barrel or truck for the hauling off of debris. Water, mosquito control chemicals, and concrete repair materials may also be required depending on the condition of the structure. Refer to manufacturer's maintenance/repair specifications for ADS manholes and risers. The cost to perform routine maintenance tasks including removal of debris, sediment and trash is estimated to be no more than $5,000/year for the onsite proposed systems.

Related inspection and maintenance forms for this work are located in the appendix of this report.

V. MAINTENANCE OF SUBSURFACE DETENTION BASINS

The detention systems, including the outlet control structure and pipes, are expected to receive and/or accumulate debris and sediment on occasion. These systems should be inspected quarterly for clogging and excessive debris and sediment accumulation as well as after every storm exceeding one inch of rainfall. Accumulated sediment removal should take place when all runoff has drained from the subsurface detention systems and the systems are reasonably dry. Disposal of debris, trash, sediment, and other waste material shall be done at suitable disposal/recycling sites and in compliance with all applicable local, county, State and federal waste regulations.

All structural components must be inspected quarterly for cracking, subsidence, breaching, wearing, and deterioration. The condition of surrounding above-ground areas shall be inspected for evidence of potential failures or deterioration of buried stormwater facilities.

The routine equipment expected to be utilized for the maintenance tasks may include a jet vacuum vehicle, shovels, lighting equipment, and a wheel barrow or truck for the hauling of debris. Water and concrete repair materials may also be required depending on the condition of the structures.

No specialty equipment should be needed. Follow standard manufacturer's instructions or user manuals for these components. The cost to perform routine maintenance tasks including removal of debris, sediment and trash is estimated to be no more than $5,000/year for the onsite proposed stormwater detention systems.

Related inspection and maintenance forms for this work are located in the appendix of this report.

VI. ANNUAL EVALUATION OF THE EFFECTIVENESS OF THE PLAN

As per N.J.A.C. 7:8-5.8(g), the person responsible for maintenance shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan as needed. The annual assessment shall be documented. Records must be retained and be available upon request for review by a public entity with administrative, health, environmental, or safety authority over the site

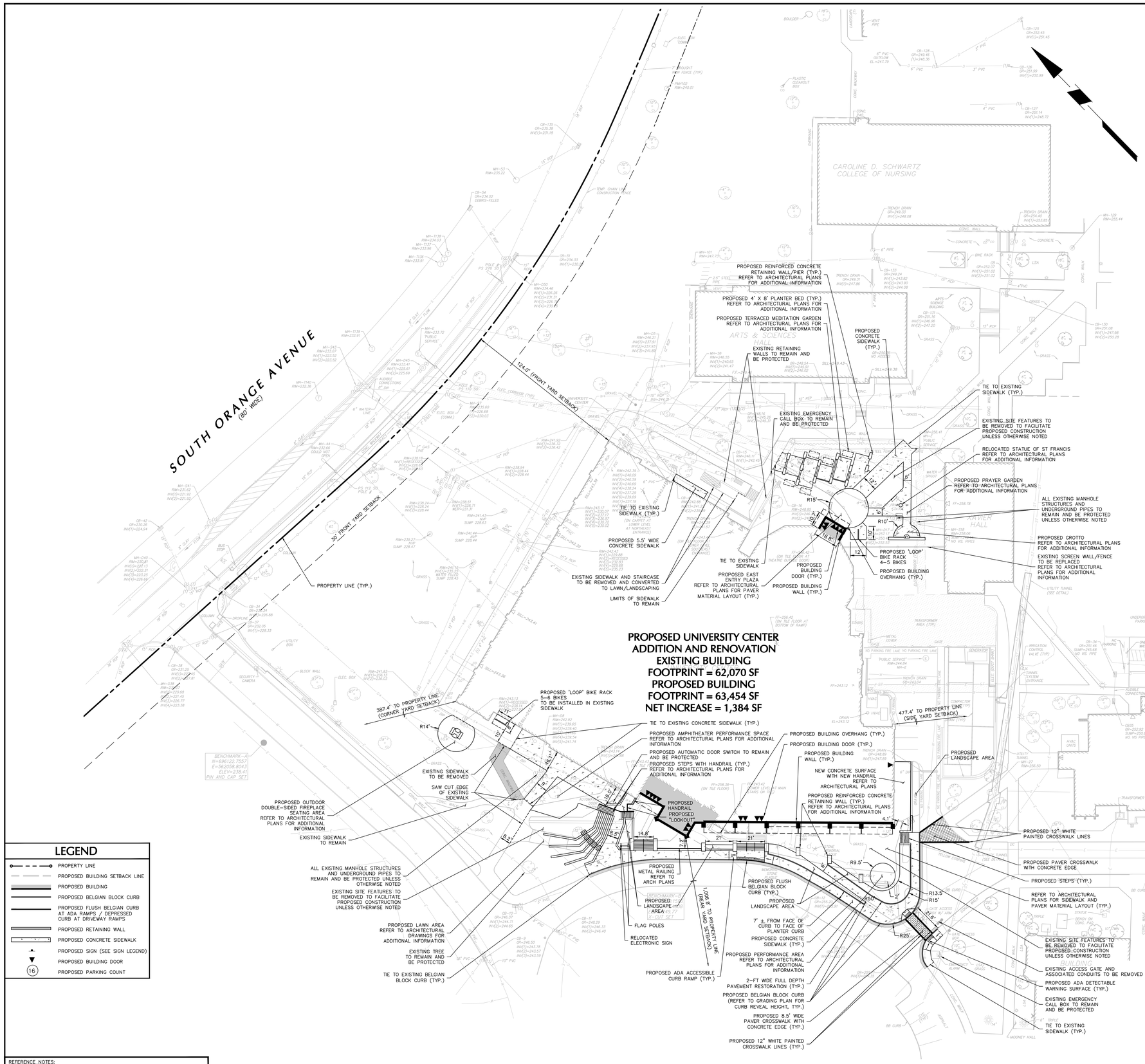
The responsible party should evaluate the effectiveness of the maintenance plan by comparing the maintenance plan with the actual performance of the maintenance. The items to evaluate may include, but not limited to,

- Whether the inspections have been performed as scheduled;
- Whether the preventive maintenance has been performed as scheduled;
- Whether the frequency of preventative maintenance needs to increase or decrease;
- Whether the planned resources were enough to perform the maintenance;
- Whether the repairs were completed on time;
- Whether the inspection, maintenance, and repair records have been kept.

If actual performance of those items has deviated from the maintenance plan, the responsible party should find the causes and implement solutions in a revised maintenance plan.

An annual evaluation form is located in the appendix of this report.

DRAWINGS



GENERAL NOTES

1. THESE PLANS REPRESENT OVERALL SITEWORK IMPROVEMENTS REQUIRED FOR PROJECT CONSTRUCTION. THE WORK TO BE PERFORMED IS SHOWN ON THE DRAWINGS AND IS DESCRIBED IN THE CONTRACT SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION; AS SUCH, THESE PLANS DO NOT COMPLETELY REPRESENT ALL SPECIFIC SITE DETAILS OF INSTALLATION REQUIRED FOR SITEWORK CONSTRUCTION. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL IMPROVEMENTS REQUIRED TO ACHIEVE CONSTRUCTION DEPICTED ON THESE PLANS.
2. THE CONTRACTOR SHALL ACCEPT THE SITE AS IS. THE CONTRACTOR SHALL ASSESS CONDITIONS, AND THE KIND, QUALITY AND QUANTITY OF WORK REQUIRED. THE OWNER MAKES NO GUARANTEE IN REGARD TO THE ACCURACY OF ANY AVAILABLE INFORMATION WHICH WAS OBTAINED DURING INVESTIGATIONS. THE CONTRACTOR SHALL MAKE A THOROUGH SITE INSPECTION IN ORDER TO FIELD CHECK EXISTING SITE CONDITIONS, CORRELATE CONDITIONS WITH THE DRAWINGS AND RESOLVE ANY POSSIBLE CONSTRUCTION CONFLICTS WITH THE OWNER AND ENGINEER PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR SHALL MAKE ADDITIONAL TOPOGRAPHIC SURVEYS AS DEEMED NECESSARY, PROVIDED THEY ARE COORDINATED WITH THE OWNER. ANY CONDITIONS DETERMINED BY THE CONTRACTOR THAT DIFFER FROM THE INFORMATION SHOWN ON THE DRAWINGS THAT ARE NOT BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER PRIOR TO THE START OF WORK SHALL NOT BE CONSIDERED GROUNDS FOR ADDITIONAL PAYMENT OR CHANGES TO THE CONTRACT DURATION, OR ANY OTHER CLAIMS AGAINST THE OWNER OR OWNER'S ENGINEER.
3. THE CONTRACTOR SHALL, WHEN HE/SHE DEEMS NECESSARY, PROVIDE WRITTEN REQUESTS FOR INFORMATION (RFI) TO THE OWNER AND ENGINEER PRIOR TO THE CONSTRUCTION OF ANY SPECIFIC SITEWORK ITEM. THE (RFI) SHALL BE IN A FORM ACCEPTABLE TO OWNER AND ENGINEER AND SHALL ALLOW FOR A MINIMUM OF TWO WORK DAYS OR ADDITIONAL REASONABLE TIME FOR A WRITTEN REPLY. RFI SHALL BE NUMBERED CONSECUTIVELY BY DATE SUBMITTED. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITEWORK ITEMS CONSTRUCTED DIFFERENTLY THAN INTENDED OR AS DEPICTED ON THE PLANS
4. INFORMATION RELATED TO ELEVATIONS AND PROPOSED UTILITIES (SUCH AS ROADWAY GRADES, INVERT ELEVATIONS, RIM ELEVATIONS, GRATE ELEVATIONS, BUILDING FINISHED FLOOR ELEVATIONS, ETC.) MAY BE FOUND IN MORE THAN ONE LOCATION ON THE DRAWINGS. CONTRACTOR SHALL SPECIFICALLY REVIEW ALL PLANS, PROFILES AND ANY INFORMATION/DATA TABLES FOR CONSISTENCY PRIOR TO CONSTRUCTION. ANY INCONSISTENCIES OR DISCREPANCIES THAT ARE FOUND SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER'S ENGINEER IN WRITING PRIOR TO CONSTRUCTION.
5. THERE ARE ADDITIONAL NOTES, SPECIFICATIONS AND REQUIREMENTS CONTAINED ON SHEETS THROUGHOUT THE PLAN SET AND AVAILABLE REFERENCES TO SPECIFICATIONS FROM APPLICABLE GOVERNING AUTHORITIES AND INDUSTRY STANDARDS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN, REVIEW AND ADHERE TO ALL APPLICABLE REQUIREMENTS.
6. CONTRACTOR IS SPECIFICALLY CAUTIONED THAT ALL CONSTRUCTION STAKEOUT FOR THIS PROJECT MUST BE COMPLETED FROM THE SITE SPECIFIC SURVEY CONTROL (HORIZONTAL AND VERTICAL) UPON WHICH THE DESIGN IS BASED. THE CONTRACTOR SHOULD NOT RELY ON OR RE–ESTABLISH SURVEY CONTROL BY GPS OR OTHER METHODS FOR USE IN CONSTRUCTION STAKEOUT OR ANY OTHER PURPOSE FOR THIS PROJECT. ANY DISCREPANCIES BETWEEN THE EXISTING HORIZONTAL OR VERTICAL DATA SHOWN ON THESE DRAWINGS AND THAT ENCOUNTERED IN THE FIELD MUST BE REPORTED TO THE DESIGN TEAM PRIOR TO CONSTRUCTION FOR RESOLUTION.
7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL DRAINAGE AND UTILITY STRUCTURES AND MANUFACTURED PRODUCTS TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WITH CONSTRUCTION.
8. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND DETAILS CONTIGUOUS TO THE BUILDING, INCLUDING BUILDING ENTRANCES, STAIRWAYS, UTILITY PENETRATIONS, CONCRETE DOOR PADS, BOLLARDS, ETC.
9. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OR LOCATIONS ON THE DRAWINGS.
10. CONTRACTOR SHALL NOT RELY SOLELY ON ELECTRONIC VERSIONS OF PLANS, SPECIFICATIONS, AND DATA FILES THAT ARE OBTAINED FROM THE DESIGNERS, BUT SHALL VERIFY LOCATION OF PROJECT FEATURES IN ACCORDANCE WITH THE PAPER COPIES OF THE PLANS AND SPECIFICATIONS THAT ARE SUPPLIED AS PART OF THE CONTRACT DOCUMENTS.
11. CONTRACTOR TO CONFIRM ALL ADA WORK IS PERFORMED IN ACCORDANCE WITH THE LATEST STANDARD AND REGULATIONS PER APPLICABLE TOWNSHIP OF SOUTH ORANGE, ESSEX COUNTY, STATE OF NEW JERSEY AND FEDERAL CODES.

NOTE:

NO CHANGES ARE PROPOSED TO THE UNIVERSITY'S EXISTING SOLID WASTE AND RECYCLING PLANS.

SIGN LEGEND

- 10 MINUTE PARKING — CUSTOM 12"X18" — 1
- DO NOT ENTER — R5–1 30"X30" — 2
- R3–1 24"X24" — 3
- AUTHORIZED VEHICLES ONLY — R5–11 30"X24" — 4
- STOP — R1–1 30"X30" — 5

LEGEND

- PROPERTY LINE
- PROPOSED BUILDING SETBACK LINE
- PROPOSED BUILDING
- PROPOSED BELGIAN BLOCK CURB
- PROPOSED FLUSH BELGIAN CURB AT ADA RAMPS / DEPRESSED CURB AT DRIVEWAY RAMPS
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE SIDEWALK
- PROPOSED SIGN (SEE SIGN LEGEND)
- PROPOSED BUILDING DOOR
- (16) PROPOSED PARKING COUNT

REFERENCE NOTES:

1. EXISTING SURVEY AND TOPOGRAPHIC INFORMATION OBTAINED FROM A PLAN TITLED "PARTIAL TOPOGRAPHIC SURVEY – SETON HALL PHASE 2" PREPARED BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC. ON 15 DECEMBER 2020.
2. PROPOSED BUILDING FOOTPRINT OBTAINED ELECTRONICALLY FROM CCH ARHITECTS ON 15 DECEMBER 2020.
3. THE MERIDIAN OF THE SURVEY IS REFERENCED TO THE NEW JERSEY STATE PLANE COORDINATE SYSTEM NAD 83 (2011).
4. ELEVATIONS SHOWN ARE REFERENCED TO THE PLAN TITLED "UTILITY CLEARANCE SURVEY RESULTS, SETON HALL UNIVERSITY, SOUTH ORANGE, NJ PREPARED BY ENVIROSCAN, INC., DATED AUGUST 8, 2008".

30 0 15 30
SCALE IN FEET

Date	Description	No.
Revisions		

Signature — Date 12/17/2020
LEONARD D. SAVINO
PROFESSIONAL ENGINEER NJ LIC. No. 39238

LANGAN
Langan Engineering and Environmental Services, Inc.
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com
NJ Certificate of Authorization No. 24GA27996400

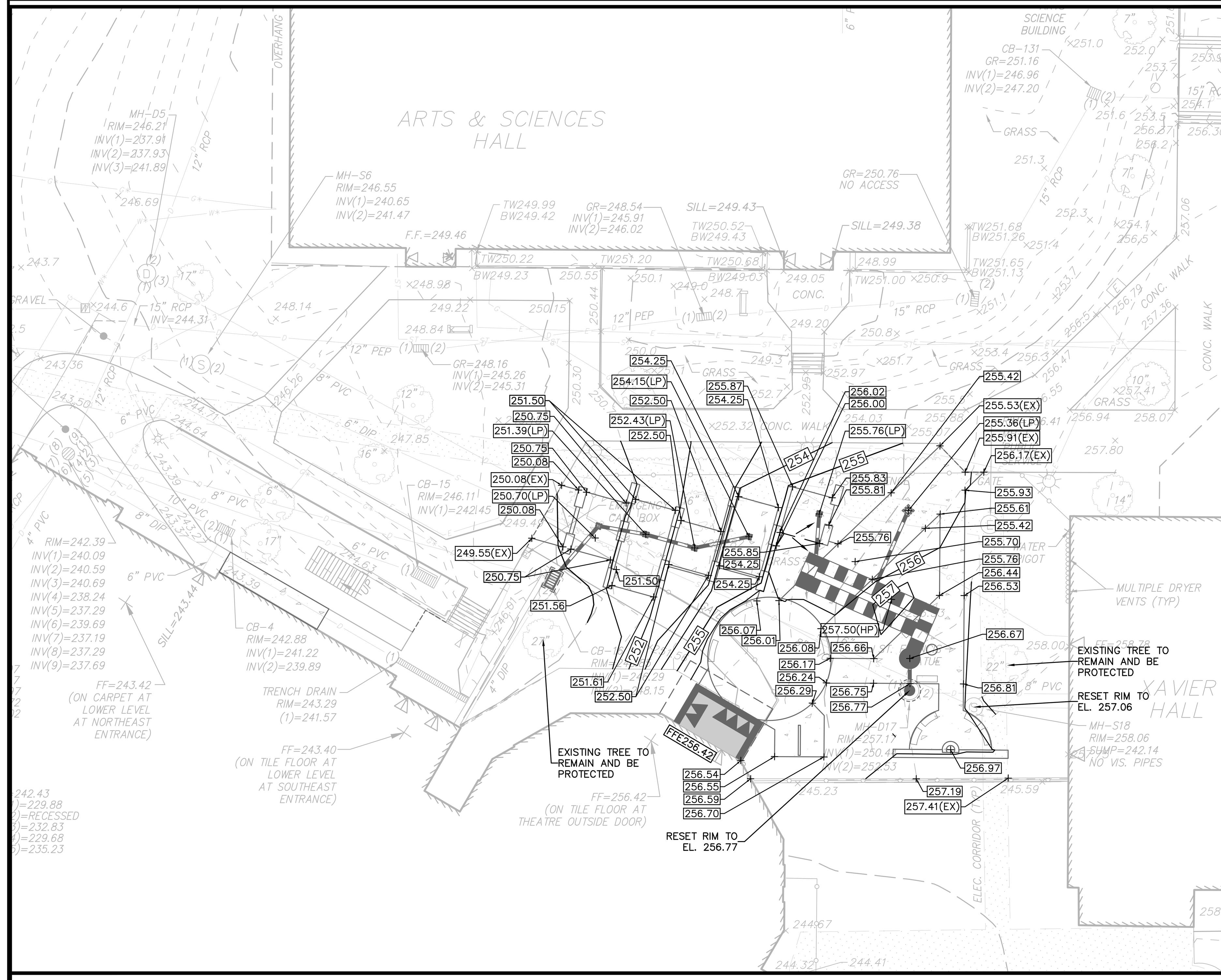
Project
UNIVERSITY CENTER PHASE 2
RENOVATION & ADDITION
SETON HALL UNIVERSITY
400 SOUTH ORANGE AVENUE
BLOCK No. 901, LOT No. 3
TOWNSHIP OF SOUTH ORANGE VILLAGE
ESSEX COUNTY NEW JERSEY

Drawing Title
SITE PLAN

Project No.	Drawing No.
100898001	CS101
Date: 12/17/2020	
Drawn By: BMW	
Checked By: JED	

Date: 12/17/2020 Time: 13:40 User: bwild Style Table: Langan.stb Layout: Layout1 Document Code: 100898001-0501-CS101-0101

LANGAN Project No. 100898001



GRADING ENLARGEMENT 'B'

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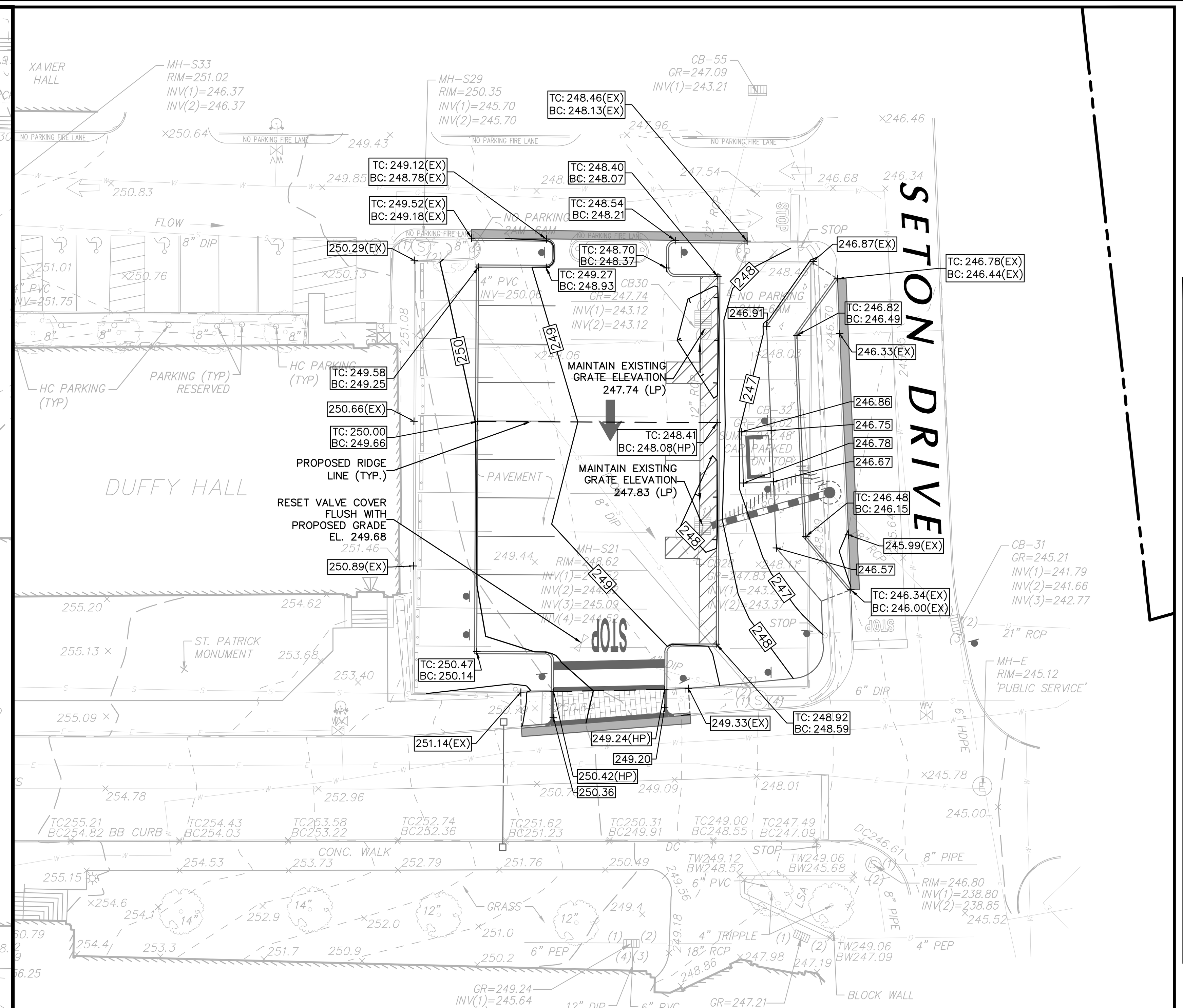

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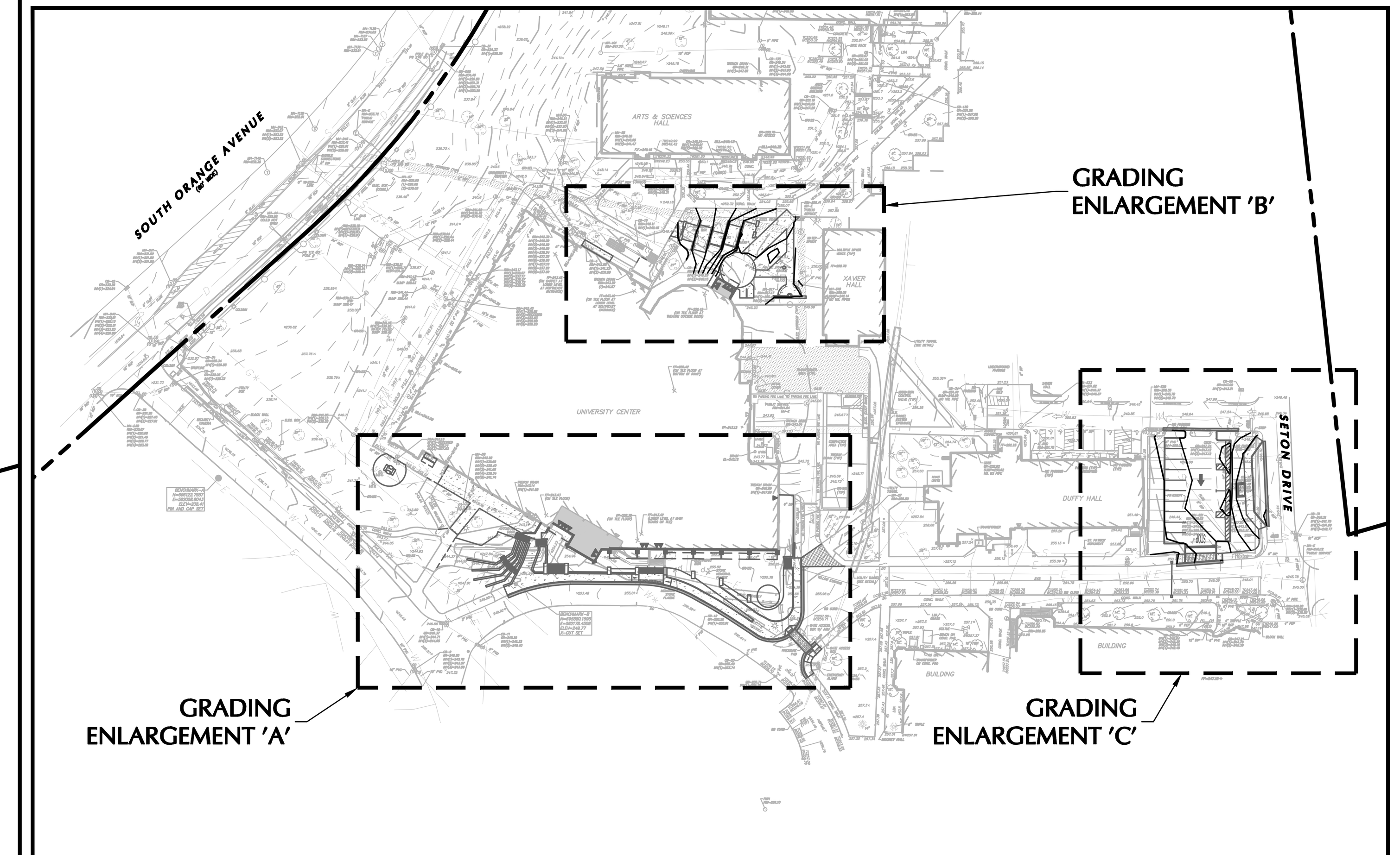

KEY MAP

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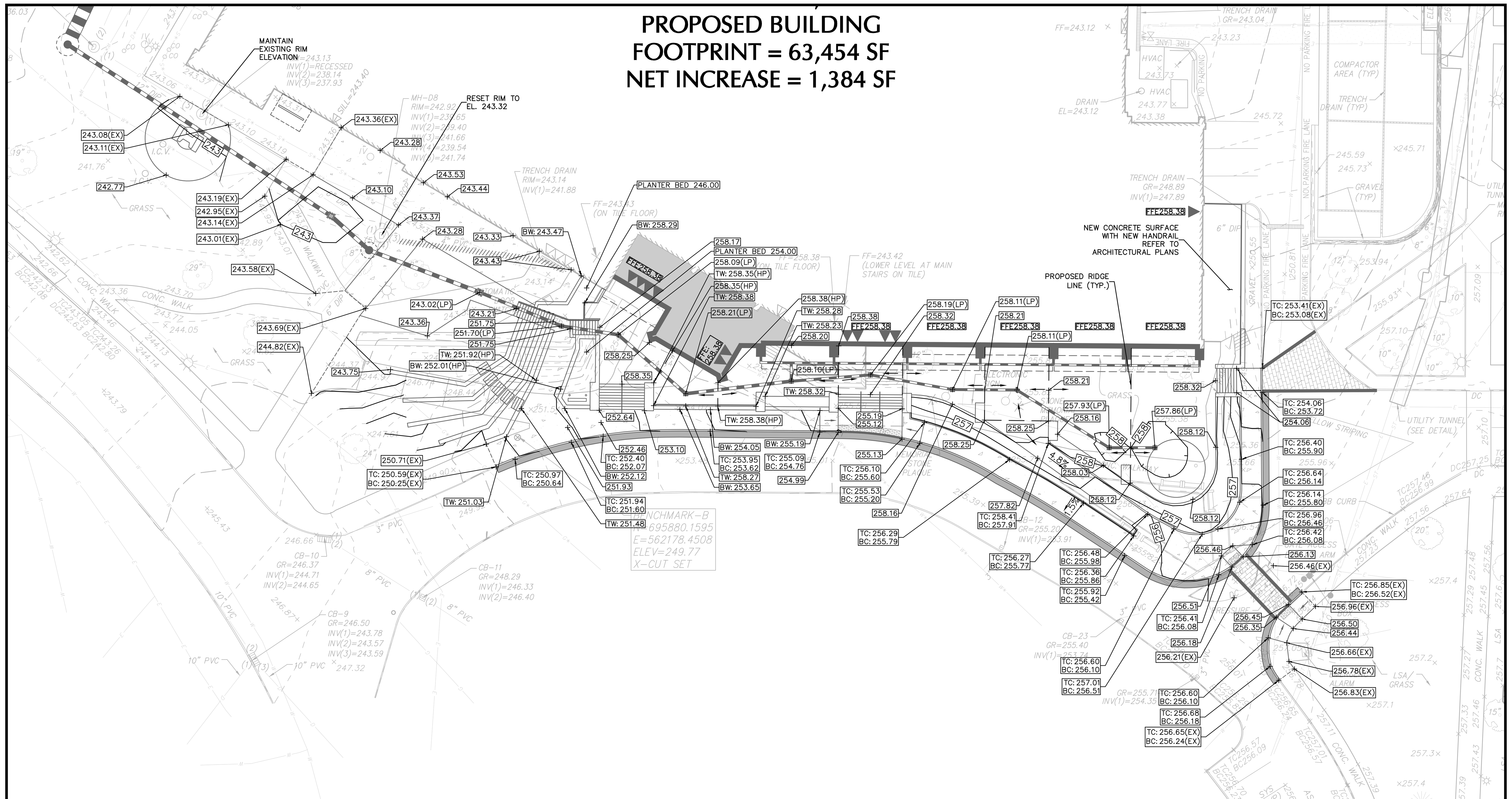
SCALE IN FEET

GRADING AND DRAINAGE NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE SHEET CE101 FOR EROSION CONTROL MEASURES.
2. SET PIPES AND STRUCTURES TO ELEVATIONS AND GRADES SHOWN ON THE DRAWINGS.
3. MINIMUM DEPTH OF COVER FOR ALL STORM SEWER PIPES IS 2 FEET OR AS SPECIFIED BY THE MANUFACTURER.
4. ALL CONCRETE DRAINAGE STRUCTURES SHALL BE PRECAST IN ACCORDANCE WITH NJDOT SPECIFICATIONS, UNLESS OTHERWISE NOTED.
5. ALL DRAINAGE STRUCTURES AND STORM SEWER PIPES SHALL MEET HEAVY DUTY TRAFFIC (H20) LOADING AND BE INSTALLED ACCORDINGLY.
6. ALL DRAINAGE STRUCTURES SHALL HAVE NO SUMP AND SHALL BE PLACED ON 6 INCHES OF COURSE AGGREGATE.
7. CATCH BASIN AND MANHOLE STRUCTURES ARE NOT SHOWN TO SCALE.
8. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR ACTUAL LOCATIONS AND SIZES OF ALL ROOF LEADERS AND COORDINATE WITH PROPOSED STORMWATER SYSTEM PRIOR TO INSTALLATION.
9. ALL ROOF DRAINS TO BUILDING SHALL BE BROUGHT TO FIVE FEET OUTSIDE THE BUILDING LIMITS BY THE SITE CONTRACTOR AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AT THE END. BUILDING CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF PIPING WITHIN FIVE FEET OF BUILDING AND CONNECTION OF BUILDING LATERALS TO SITE DRAINAGE SYSTEM.
12. CLEANOUTS SHALL BE PROVIDED FLUSH AT ALL LOCATIONS OF ROOF DRAIN INTERSECTIONS, BENDS AND UPSTREAM ENDS.
13. CONTRACTOR SHALL PROVIDE 24"x24"x8" THICK CONCRETE APRON AT ALL CLEANOUTS OUTSIDE OF BUILDING UNLESS MUNICIPAL REQUIREMENTS DICTATE OTHERWISE.
14. THE CONTRACTOR SHALL FLUSH AND CLEAN ALL EXISTING ON–SITE STORM PIPING AND STRUCTURES THAT ARE TO REMAIN WITHIN THE LIMITS OF WORK OR AS INDICATED ON THE PLANS.
15. COMPACTION CRITERIA FOR FILL PLACED IN THE FOLLOWING AREAS SHALL MEET OR EXCEED THE FOLLOWING MINIMUM PERCENTAGE OF MAXIMUM MODIFIED PROCTOR DRY DENSITY AS DETERMINED BY ASTM D–1557 USED ON REPRESENTATIVE SOIL SAMPLES, UNLESS MORE STRINGENT CRITERIA IS GIVEN ELSEWHERE (INCLUDING GEOTECHNICAL REPORT):

FILL AREA	% OF MAXIMUM MODIFIED PROCTOR DRY DENSITY
BUILDING FOOTINGS	95%
BUILDING FOOTPRINT, PAVEMENT, SIDEWALKS, AND ROADWAYS	95%
LANDSCAPED AREAS	92%
TRENCH BACKFILL	95%

16. PROTECT SUBGRADE FROM EXCESSIVE WHEEL LOADING DURING CONSTRUCTION, INCLUDING CONCRETE TRUCKS AND DUMP TRUCKS.
17. REMOVE AREAS OF FINISHED SUBGRADE FOUND TO BE UNSATISFACTORY BY OWNER'S ENGINEER AND REPLACE IN A MANNER THAT WILL COMPLY WITH COMPACTION REQUIREMENTS BY USE OF MATERIAL EQUAL TO OR BETTER THAN BEST SUBGRADE MATERIAL ON SITE. SURFACE OF SUBGRADE AFTER COMPACTION SHALL BE HARD, UNIFORM, SMOOTH, STABLE, AND TRUE TO GRADE AND CROSS–SECTION AND SHALL NOT RUT OR WEAVE WHEN LOADED WITH A FULL DUMP TRUCK.
18. STORMWATER PIPES CONFLICTING WITH THE PROPOSED SITE IMPROVEMENTS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR.
19. ALL PROPOSED STORM DRAINAGE PIPING SHALL BE TEMPORARILY PROTECTED WITH REQUIRED MINIMUM COVER FOR CONSTRUCTION.
20. ALL PROPOSED STORM DRAINAGE TO BE INSTALLED UNDERGROUND UNLESS OTHERWISE NOTED.
21. PIPE LENGTHS SHOWN REPRESENT PLANAR LENGTHS MEASURED FROM CENTER–OF–STRUCTURE TO CENTER–OF–STRUCTURE.
22. PLAN AND PROFILE STRUCTURES ARE SYMBOLS THAT ARE PROVIDED FOR REFERENCE, AND ARE NOT TO BE USED AS THE BASIS FOR CONSTRUCTION. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF ALL DRAINAGE, SANITARY, AND UTILITY STRUCTURES TO ENGINEER.
23. HDPE PIPING SHALL CONFORM TO AASHTO M 294 AND IS TYPE S (SMOOTH INTERIOR WITH ANNULAR CORRUGATIONS) WITH GASKETED WATER–TIGHT JOINTS.
24. RCP PIPING SHALL CONFORM TO A.S.T.M SPECIFICATIONS C76–81 CLASS III.
25. ABBREVIATIONS:
    - BC = BOTTOM OF CURB
    - BW = LAWN/SIDEWALK ELEVATION AT BOTTOM OF WALL
    - CB = CATCH BASIN
    - DIP = DUCTILE IRON PIPE
    - GR = GRATE ELEVATION
    - HP = HIGH POINT
    - HDPE = HIGH DENSITY POLYETHYLENE
    - INV = INVERT
    - LF = LINEAR FEET
    - LP = LOW POINT
    - MH = MANHOLE
    - PVC = POLYVINYL CHLORIDE
    - RCP = REINFORCED CONCRETE PIPE
    - RIM = RIM ELEVATION
    - RL = ROOF LEADER
    - TC = TOP OF CURB
    - TW = LAWN/SIDEWALK ELEVATION AT TOP OF WALL



GRADING ENLARGEMENT 'A'

20 0 5 10 20
SCALE IN FEET

LEGEND

- PROPERTY LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 600 PROPOSED MAJOR CONTOUR
- 601 PROPOSED MINOR CONTOUR
- 135.50 PROPOSED SPOT ELEVATION
- TC 272.76 / BC 272.26 PROPOSED TOP/BOTTOM OF CURB ELEVATION
- TW 278.20 / BW 269.00 LAWN/SIDEWALK ELEVATION AT PROPOSED TOP/BOTTOM OF WALL
- 258.31 (LP) PROPOSED LOW POINT
- 272.23 (HP) PROPOSED HIGH POINT
- PROPOSED FLOW DIRECTION
- PROPOSED RIDGE LINE
- PROPOSED DRAINAGE PIPE
- PROPOSED CATCH BASIN
- PROPOSED DRAINAGE MANHOLE

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Drawing Title
GRADING PLAN

Project No.	Drawing No.
100898001	CG101
Date: 12/17/2020	
Drawn By: BMW	
Checked By: JED	

Project No. 100898001

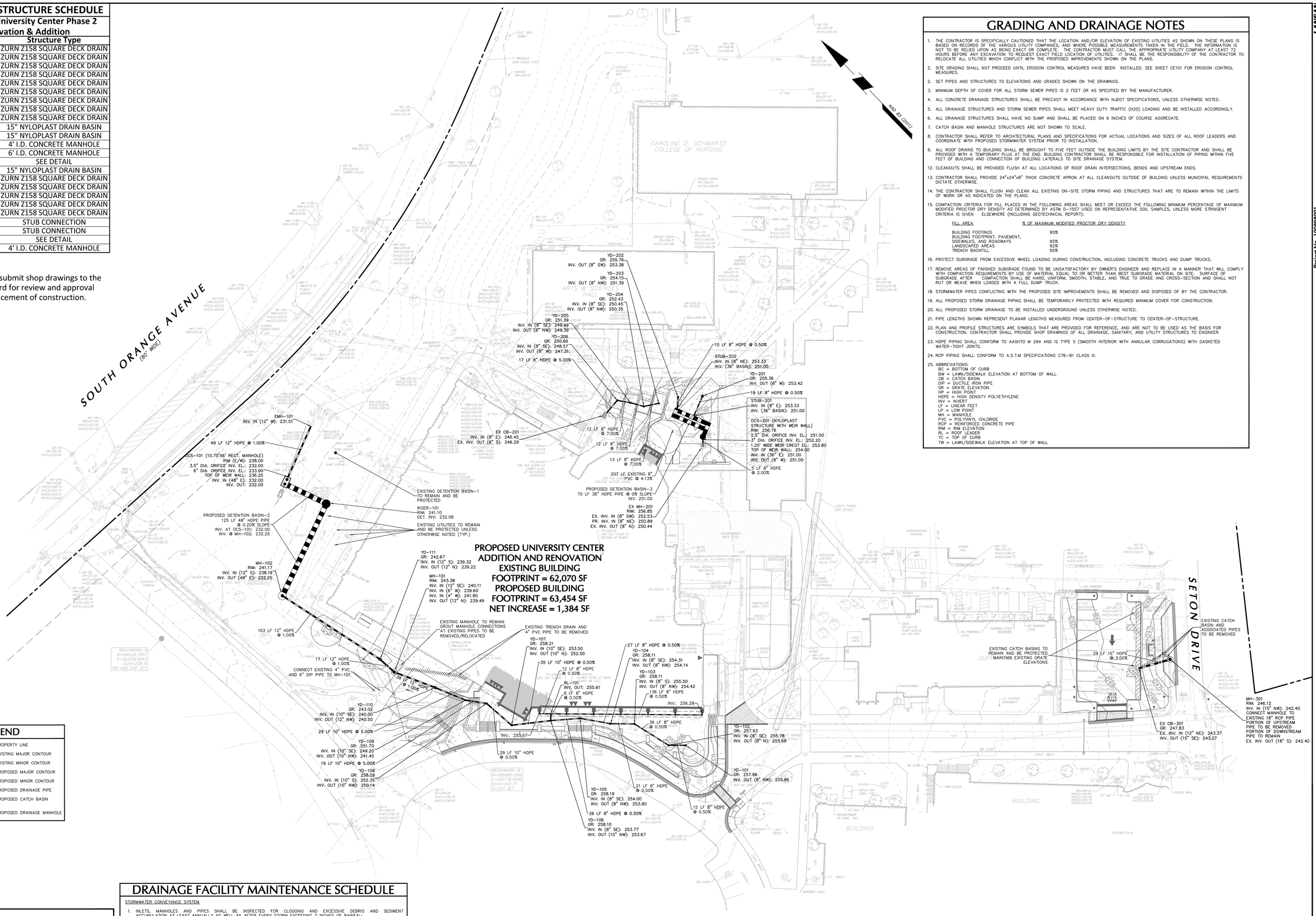
Date: 12/17/2020 Time: 13:44 User: bwild Style Table: Langan.stb Layout: Layout1 Document Code: 100898001-0501-CG101-0101

DRAINAGE STRUCTURE SCHEDULE

Seton Hall University Center Phase 2 Renovation & Addition

Structure ID	Structure Type
YD-101	ZURN Z158 SQUARE DECK DRAIN
YD-102	ZURN Z158 SQUARE DECK DRAIN
YD-103	ZURN Z158 SQUARE DECK DRAIN
YD-104	ZURN Z158 SQUARE DECK DRAIN
YD-105	ZURN Z158 SQUARE DECK DRAIN
YD-106	ZURN Z158 SQUARE DECK DRAIN
YD-107	ZURN Z158 SQUARE DECK DRAIN
YD-108	ZURN Z158 SQUARE DECK DRAIN
YD-109	ZURN Z158 SQUARE DECK DRAIN
YD-110	15" NYLOPLAST DRAIN BASIN
YD-111	15" NYLOPLAST DRAIN BASIN
MH-101	4' I.D. CONCRETE MANHOLE
MH-102	6' I.D. CONCRETE MANHOLE
OCS-101	SEE DETAIL
YD-201	15" NYLOPLAST DRAIN BASIN
YD-202	ZURN Z158 SQUARE DECK DRAIN
YD-203	ZURN Z158 SQUARE DECK DRAIN
YD-204	ZURN Z158 SQUARE DECK DRAIN
YD-205	ZURN Z158 SQUARE DECK DRAIN
YD-206	ZURN Z158 SQUARE DECK DRAIN
STUB-201	STUB CONNECTION
STUB-202	STUB CONNECTION
OCS-201	SEE DETAIL
MH-301	4' I.D. CONCRETE MANHOLE

Note:
Contractor shall submit shop drawings to the engineer of record for review and approval prior to commencement of construction.



LEGEND

- PROPERTY LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED DRAINAGE PIPE
- PROPOSED CATCH BASIN
- PROPOSED DRAINAGE MANHOLE

GRADING AND DRAINAGE NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE SHEET CE101 FOR EROSION CONTROL MEASURES.
2. SET PIPES AND STRUCTURES TO ELEVATIONS AND GRADES SHOWN ON THE DRAWINGS.
3. MINIMUM DEPTH OF COVER FOR ALL STORM SEWER PIPES IS 2 FEET OR AS SPECIFIED BY THE MANUFACTURER.
4. ALL CONCRETE DRAINAGE STRUCTURES SHALL BE PRECAST IN ACCORDANCE WITH NJDOT SPECIFICATIONS, UNLESS OTHERWISE NOTED.
5. ALL DRAINAGE STRUCTURES AND STORM SEWER PIPES SHALL MEET HEAVY DUTY TRAFFIC (H20) LOADING AND BE INSTALLED ACCORDINGLY.
6. ALL DRAINAGE STRUCTURES SHALL HAVE NO SUMP AND SHALL BE PLACED ON 6 INCHES OF COURSE AGGREGATE.
7. CATCH BASIN AND MANHOLE STRUCTURES ARE NOT SHOWN TO SCALE.
8. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR ACTUAL LOCATIONS AND SIZES OF ALL ROOF LEADERS AND COORDINATE WITH PROPOSED STORMWATER SYSTEM PRIOR TO INSTALLATION.
9. ALL ROOF DRAINS TO BUILDING SHALL BE BROUGHT TO FIVE FEET OUTSIDE THE BUILDING LIMITS BY THE SITE CONTRACTOR AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AT THE END. BUILDING CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF PIPING WITHIN FIVE FEET OF BUILDING AND CONNECTION OF BUILDING LATERALS TO SITE DRAINAGE SYSTEM.
12. CLEANOUTS SHALL BE PROVIDED FLUSH AT ALL LOCATIONS OF ROOF DRAIN INTERSECTIONS, BENDS AND UPSTREAM ENDS.
13. CONTRACTOR SHALL PROVIDE 24"x24"x8" THICK CONCRETE APRON AT ALL CLEANOUTS OUTSIDE OF BUILDING UNLESS MUNICIPAL REQUIREMENTS DICTATE OTHERWISE.
14. THE CONTRACTOR SHALL FLUSH AND CLEAN ALL EXISTING ON-SITE STORM PIPING AND STRUCTURES THAT ARE TO REMAIN WITHIN THE LIMITS OF WORK OR AS INDICATED ON THE PLANS.
15. COMPACTION CRITERIA FOR FILL PLACED IN THE FOLLOWING AREAS SHALL MEET OR EXCEED THE FOLLOWING MINIMUM PERCENTAGE OF MAXIMUM MODIFIED PROCTOR DRY DENSITY AS DETERMINED BY ASTM D-1557 USED ON REPRESENTATIVE SOIL SAMPLES, UNLESS MORE STRINGENT CRITERIA IS GIVEN ELSEWHERE (INCLUDING GEOTECHNICAL REPORT):

FILL AREA	% OF MAXIMUM MODIFIED PROCTOR DRY DENSITY
BUILDING FOOTINGS	95%
BUILDING FOOTPRINT, PAVEMENT, SIDEWALKS, AND ROADWAYS	95%
LANDSCAPED AREAS	92%
TRENCH BACKFILL	95%

16. PROTECT SUBGRADE FROM EXCESSIVE WHEEL LOADING DURING CONSTRUCTION, INCLUDING CONCRETE TRUCKS AND DUMP TRUCKS.
17. REMOVE AREAS OF FINISHED SUBGRADE FOUND TO BE UNSATISFACTORY BY OWNER'S ENGINEER AND REPLACE IN A MANNER THAT WILL COMPLY WITH COMPACTION REQUIREMENTS BY USE OF MATERIAL EQUAL TO OR BETTER THAN BEST SUBGRADE MATERIAL ON SITE. SURFACE OF SUBGRADE AFTER COMPACTION SHALL BE HARD, UNIFORM, SMOOTH, STABLE, AND TRUE TO GRADE AND CROSS-SECTION AND SHALL NOT RUT OR WEAVE WHEN LOADED WITH A FULL DUMP TRUCK.
18. STORMWATER PIPES CONFLICTING WITH THE PROPOSED SITE IMPROVEMENTS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR.
19. ALL PROPOSED STORM DRAINAGE PIPING SHALL BE TEMPORARILY PROTECTED WITH REQUIRED MINIMUM COVER FOR CONSTRUCTION.
20. ALL PROPOSED STORM DRAINAGE TO BE INSTALLED UNDERGROUND UNLESS OTHERWISE NOTED.
21. PIPE LENGTHS SHOWN REPRESENT PLANAR LENGTHS MEASURED FROM CENTER-OF-STRUCTURE TO CENTER-OF-STRUCTURE.
22. PLAN AND PROFILE STRUCTURES ARE SYMBOLS THAT ARE PROVIDED FOR REFERENCE, AND ARE NOT TO BE USED AS THE BASIS FOR CONSTRUCTION. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF ALL DRAINAGE, SANITARY, AND UTILITY STRUCTURES TO ENGINEER.
23. HDPE PIPING SHALL CONFORM TO AASHTO M 294 AND IS TYPE S (SMOOTH INTERIOR WITH ANNULAR CORRUGATIONS) WITH GASKETED WATER-TIGHT JOINTS.
24. RCP PIPING SHALL CONFORM TO A.S.T.M SPECIFICATIONS C76-81 CLASS III.
25. ABBREVIATIONS:
BC = BOTTOM OF CURB
BW = LAWN/SIDEWALK ELEVATION AT BOTTOM OF WALL
CB = CATCH BASIN
DIP = DUCTILE IRON PIPE
GR = GRATE ELEVATION
HP = HIGH POINT
HDPE = HIGH DENSITY POLYETHYLENE
INV = INVERT
LF = LINEAR FEET
LP = LOW POINT
MH = MANHOLE
PVC = POLYVINYL CHLORIDE
RCP = REINFORCED CONCRETE PIPE
RIM = RIM ELEVATION
RL = ROOF LEADER
TC = TOP OF CURB
TW = LAWN/SIDEWALK ELEVATION AT TOP OF WALL

DRAINAGE FACILITY MAINTENANCE SCHEDULE

STORMWATER CONVEYANCE SYSTEM

1. INLETS, MANHOLES AND PIPES SHALL BE INSPECTED FOR CLOGGING AND EXCESSIVE DEBRIS AND SEDIMENT ACCUMULATION AT LEAST ANNUALLY AS WELL AS AFTER EVERY STORM EXCEEDING 2 INCHES OF RAINFALL.
2. DEBRIS AND SEDIMENT SHOULD BE REMOVED WHEN ENCOUNTERED DURING INSPECTIONS.
3. ALL STRUCTURAL COMPONENTS MUST BE INSPECTED FOR CRACKING, SUBSIDENCE, BREACHING, WEARING, AND DETERIORATION AT LEAST ANNUALLY.
4. THE CONDITION OF SURROUNDING AND ABOVE LYING MATERIALS SHALL BE INSPECTED FOR EVIDENCE OF POTENTIAL FAILURES OR DETERIORATION DURING EACH INSPECTION NOTED ABOVE.

STORMWATER DETENTION SYSTEM

1. INLETS, MANHOLES AND PIPES SHALL BE INSPECTED FOR CLOGGING AND EXCESSIVE DEBRIS AND SEDIMENT ACCUMULATION AT LEAST ANNUALLY.
2. DEBRIS AND SEDIMENT SHOULD BE REMOVED WHEN ENCOUNTERED DURING INSPECTIONS.
3. ALL STRUCTURAL COMPONENTS MUST BE INSPECTED FOR CRACKING, SUBSIDENCE, BREACHING, WEARING, AND DETERIORATION AT LEAST ANNUALLY.
4. THE CONDITION OF SURROUNDING AND ABOVE LYING MATERIALS SHALL BE INSPECTED FOR EVIDENCE OF POTENTIAL FAILURES OR DETERIORATION DURING EACH INSPECTION NOTED ABOVE.

REFERENCE NOTES:

1. EXISTING SURVEY AND TOPOGRAPHIC INFORMATION OBTAINED FROM A PLAN TITLED "PARTIAL TOPOGRAPHIC SURVEY – SETON HALL PHASE 2" PREPARED BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC. ON 15 DECEMBER 2020.
2. PROPOSED BUILDING FOOTPRINT OBTAINED ELECTRONICALLY FROM CCH ARHITECTS ON 15 DECEMBER 2020.
3. THE MERIDIAN OF THE SURVEY IS REFERENCED TO THE NEW JERSEY STATE PLANE COORDINATE SYSTEM NAD 83 (2011).
4. ELEVATIONS SHOWN ARE REFERENCED TO THE PLAN TITLED "UTILITY CLEARANCE SURVEY RESULTS, SETON HALL UNIVERSITY, SOUTH ORANGE, NJ PREPARED BY ENVIROSCAN, INC., DATED AUGUST 8, 2008".

30 0 15 30
SCALE IN FEET

Date	Description	No.
Revisions		

Leonard D. Savino 12/17/2020
Signature Date
LEONARD D. SAVINO
PROFESSIONAL ENGINEER NJ LIC. No. 39238

LANGAN
Langan Engineering and Environmental Services, Inc.
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com
NJ Certificate of Authorization No. 24GA27996400

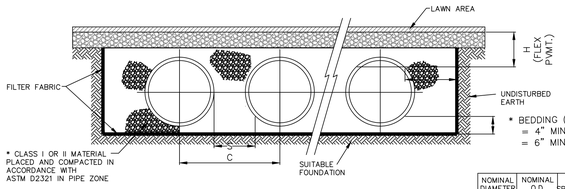
Project
UNIVERSITY CENTER PHASE 2 RENOVATION & ADDITION
SETON HALL UNIVERSITY
400 SOUTH ORANGE AVENUE
BLOCK No. 901, LOT No. 3
TOWNSHIP OF SOUTH ORANGE VILLAGE
ESSEX COUNTY NEW JERSEY

Drawing Title
DRAINAGE PLAN

Project No.	100898001
Date	12/17/2020
Drawn By	BMW
Checked By	JED
Drawing No.	CG102

LANGAN
Project No. 100898001

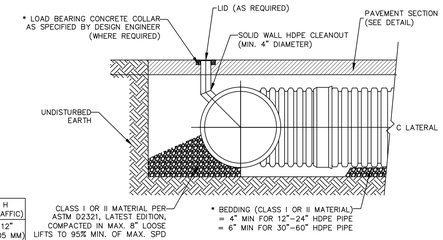
Date: 12/17/2020 Time: 13:32 User: bwild Style Table: Langan.stb Layout: Layout1 Document Code: 100898001-0501-CG102-0101



NOMINAL DIAMETER	NOMINAL O.D.	TYPICAL SPACING "S"	TYPICAL SPACING "C"	TYPICAL SIDE WALL "X"	H (NON-TRAFFIC)	H (TRAFFIC)
36" (900 MM)	42" (1067 MM)	22" (559 MM)	63" (1600 MM)	18" (457 MM)	12" (305 MM)	12" (305 MM)
48" (1200 MM)	54" (1372 MM)	25" (635 MM)	78.5" (1994 MM)	18" (457 MM)	12" (305 MM)	24" (610 MM)

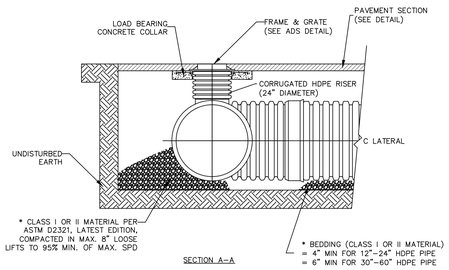
NOTES:

1. ALL REFERENCES TO CLASS I OR II MATERIAL ARE PER ASTM D2321 "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS" LATEST EDITION.
2. ALL DETENTION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, LATEST EDITION AND THE MANUFACTURER'S PUBLISHED INSTALLATION GUIDELINES.
3. MEASURES SHOULD BE TAKEN TO PREVENT THE MIGRATION OF NATIVE FINES INTO THE BACKFILL MATERIAL, WHEN REQUIRED. SEE ASTM D2321.
4. FILTER FABRIC: A GEOTEXTILE FABRIC MAY BE USED AS SPECIFIED BY THE ENGINEER TO PREVENT THE MIGRATION OF FINES FROM THE NATIVE SOIL INTO THE SELECT BACKFILL MATERIAL.
5. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
6. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I OR II. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" FOR 4"–24"; 6" FOR 30"–60".
7. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I OR II IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
8. MINIMUM COVER: MINIMUM COVER IS 12" UP TO 36" DIAMETER PIPE AND 24" OF COVER FOR 42" – 60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION.

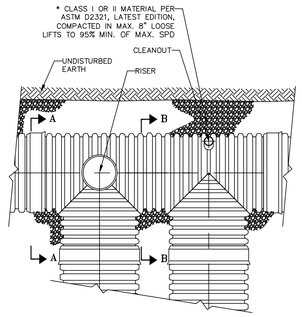


SECTION B–B

* CLASS I BACKFILL REQUIRED AROUND 60" DIAMETER FITTINGS
* LOAD BEARING CONCRETE COLLAR SHALL BE CONSTRUCTED IN TRAFFIC AREAS SUCH THAT THE LIVE LOAD IS TRANSMITTED TO THE SURROUNDING SOIL AND NOT DIRECTLY TO THE RISER.

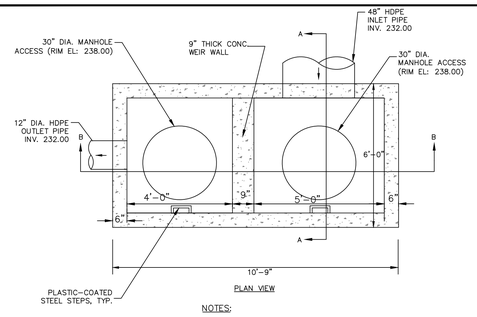


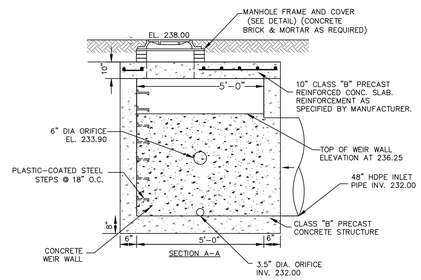
SECTION A–A

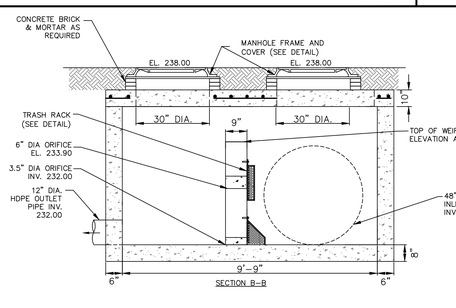


NOTE: DETAILS OBTAINED FROM ADS WEBSITE.

ADS DETENTION BASIN INSTALLATION LAYOUT





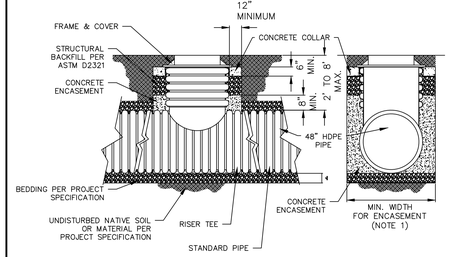


NOTES:

1. PRECAST OUTLET CONTROL STRUCTURE TO BE IN ACCORDANCE WITH THE LATEST ASTM DESIGNATION C–478. CONCRETE TO TEST TO 4,500 PSI @ 28 DAYS.
2. PROVIDE POLYPROPYLENE STEPS AT 18" O.C.
3. CONCRETE STRUCTURE TO BE DESIGNED TO AASHTO HS–20 LOADING.
4. SUBGRADE TO BE COMPACTED TO 95% PROCTOR DENSITY.
5. CONCRETE STRUCTURE REINFORCING TO MEET ASTM STANDARDS.
6. FIRST STEP NOT TO EXCEED 12 INCHES FROM THE TOP OF THE RIM.
7. PRECAST MANUFACTURER IS RESPONSIBLE FOR STRUCTURAL DESIGN OF ALL PROPOSED PRECAST STRUCTURES.
8. PROVIDE SHOP DRAWINGS FOR STRUCTURE AND APPURTENANCES FOR REVIEW.
9. EXTERIOR SURFACE OF STRUCTURE TO BE SEAL COATED WITH COAL TAR OR ASPHALTIC PITCH.

OUTLET CONTROL STRUCTURE-101

ADS MANHOLE RISER



NOTES:

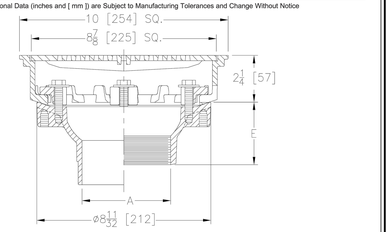
1. RECOMMENDED MINIMUM TRENCH WIDTH FOR ENCASEMENT AROUND RISER TEE = O.D. + 16". STANDARD PIPE INSTALLATION MAY REQUIRE A WIDER TRENCH. FOR MINIMUM TRENCH WIDTHS OF STANDARD PIPE REFERENCE THE DRAINAGE HANDBOOK
2. DETAIL OBTAINED FROM ADS WEBSITE.

ZURN Z158 SQUARE DECK DRAIN

Z158
10 [254] SQUARE TOP PROM-DECK DRAIN
W/ HEEL-PROOF GRATE & ROTATABLE FRAME

SPECIFICATION SHEET
TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



A Pipe Size In. [mm]	Approx. Wt. Lbs. [kg]	Grate Open Area Sq. In. [cm²]
2, 3, 4 [51, 76, 102]	20 [9]	21 [136]

ENGINEERING SPECIFICATION: ZURNZ158
10" [254mm] Square Top Prom-Deck drain, Dura-Coated cast iron body with rotatable square promenade frame with seepage openings, frame clamps and light duty heel-proof grate.

OPTIONS (Check/specify appropriate options)

PIPE SIZE	(Specify size/type) OUTLET	'E' BODY HT. DIM.
3, 4 [76, 102]	____ IC Inside Caulk	3-7/8 [98]
4 [102]	____ IP Threaded	3 [76]
3 [76]	____ IP Threaded	2- 3/4 [70]
2 [51]	____ IP Threaded	2- 7/16 [62]
2, 3, 4 [51, 76, 102]	____ NH No-Hub	4 [102]
2, 3, 4 [51, 76, 102]	____ NL Neo-Loc	3-13/16 [97]

PREFIXES
___ Z D.C.C.I. Body with Top*
___ ZB D.C.C.I. Body with Polished Bronze Top (Add 3/16 [5] to 2-1/4 [57] Dim & 5/8 [16] to 10 [254] Dim.)
___ ZN D.C.C.I. Body with Polished Nickel Bronze Top (Add 3/16 [5] to 2-1/4 [57] Dim & 5/8 [16] to 10 [254] Dim.)

SUFFIXES
___ -AR Acid Resistant Epoxy Coated Finish
___ -C Underdeck Clamp
___ -DG Duresist Grate
___ -DP Top-Set® Roof Deck Plate
___ -E 2 [51] High Static Extension
___ -EB Top-Set® Adjustable Extension Assembly
___ -G Galvanized Cast Iron
___ -SC Secondary Clamp Collar
___ -TC Neo-Loc Test Cap Gasket (2, 3, 4 [51, 76, 102] NL Bottom Outlet only)
___ -TS Top Secured with Slotted Screws
___ -VP Vandal-Proof Secured Top
___ -Y Sediment Bucket
___ -85 Stainless Steel Perforated Extension
___ -90 90° Threaded Side Outlet Body (2, 3, 4 [51, 76, 102])

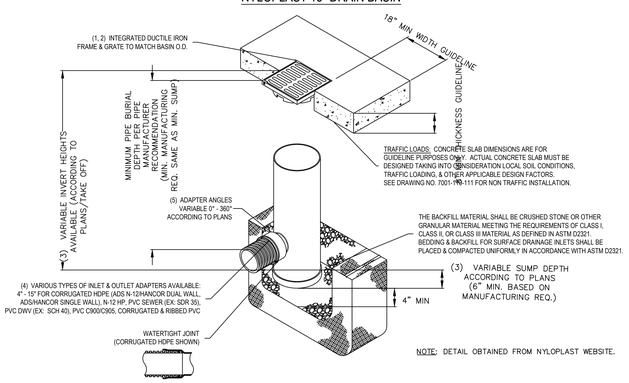
* Regularly furnished unless otherwise specified. **Note:** -DP and -90 option can not be specified together.

Zurn Industries, LLC | **Specification Drainage Operation**
1801 Pittsburgh Avenue, Erie, PA U.S.A. 16502 · Ph. 855-663-9876, Fax 814-454-7929
In Canada | **Zurn Industries Limited**
3544 Nashua Drive, Mississauga, Ontario L4V 1L2 · Ph. 905-405-8272, Fax 905-405-1292
www.zurn.com

Rev. L
Date: 09/25/2017
C.N. No. 137806
Prod. | Dwg. No. Z158

NYLOPLAST 15" DRAIN BASIN

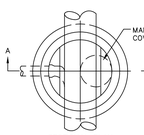
GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-10	1599CGP	7001-110-207



1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05, WITH THE EXCEPTION OF THE BRONZE GRATE.
2 - FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-005
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER.
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.

NOTE: DETAIL OBTAINED FROM NYLOPLAST WEBSITE.

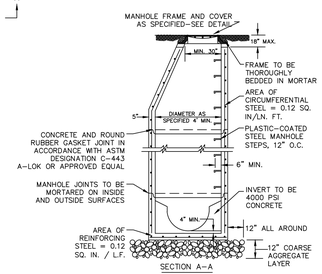
15" NYLOPLAST DRAIN BASIN



SECTIONAL PLAN

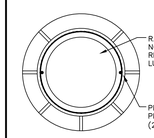
PIPE IN AND OUT OF MANHOLE TO BE BEDDED IN STONE, OR AS ORDERED BY ENGINEER.

CONSTRUCTION NOTES:
1. PRECAST MANHOLE SECTIONS TO BE IN ACCORDANCE WITH LATEST ASTM DESIGNATION C–478, MINIMUM COMPRESSION STRENGTH TO BE 4000 PSI.
2. FLEXIBLE RUBBER BOOT SHALL BE USED FOR CONNECTION OF PVC PIPE TO MANHOLE.
3. PRECAST CHANNELS SHALL NOT BE USED FOR BENDS GREATER THAN 45°. POURED CONCRETE LONG RADIUS CHANNELS SHALL BE CONSTRUCTED.
4. MANHOLE INSIDE DIAMETER SHALL BE 5 FT FOR 48" DIA. PIPE.

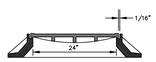


SECTION A–A

MANHOLE



PLAN – MANHOLE FRAME



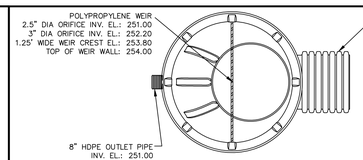
SECTION – MANHOLE FRAME

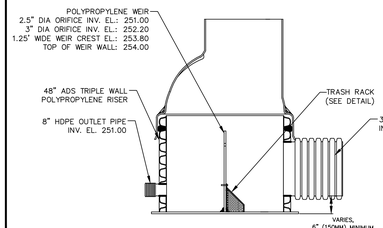
MANHOLE COVERS AND FRAMES SHALL BE:

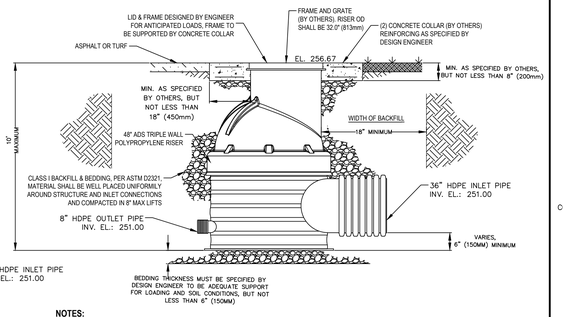
STANDARD (HEAVY TRAFFIC TYPE): CAMPBELL FOUNDRY COMPANY PATTERN NO. 1203, OR APPROVED EQUAL.

CONSTRUCTION NOTES:
1. MANHOLE FRAME AND COVER CASTINGS SHALL CONFORM TO THE LATEST ASTM A–48 CLASS 30 SPECIFICATION.
2. FRAME AND COVERS SHALL BE COATED WITH TWO COATS OF ASPHALTUM VARNISH.

MANHOLE FRAME & COVER



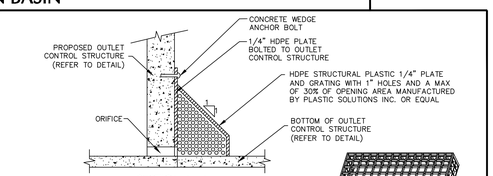




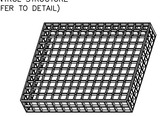
NOTES:
1 - FOR BURIAL DEPTHS GREATER THAN 10', OR WHERE GROUND WATER WILL BE ENCOUNTERED, CONTACT ADS APPLICAITONS
2 - AVOID CONSTRUCTION LOADING ON DOME AND STRUCUTRE PRIOR TO CONCRETE COLLAR INSTALLATION

NOTE: DETAIL OBTAINED FROM NYLOPLAST WEBSITE.

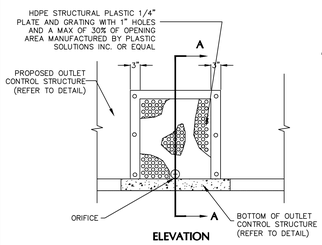
OUTLET CONTROL STRUCTURE 201



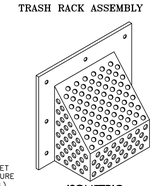
SECTION A - A
NOT TO SCALE



TRASH RACK ASSEMBLY



ELEVATION



ISOMETRIC

OUTLET CONTROL STRUCTURE TRASH RACK

Date	Description	No.
	Revisions	

Leonard D. Savino 12/17/2020
Signature Date
LEONARD D. SAVINO
PROFESSIONAL ENGINEER NJ LIC. No. 39238

LANGAN
Langan Engineering and Environmental Services, Inc.
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com
NJ Certificate of Authorization No. 24GA27996400

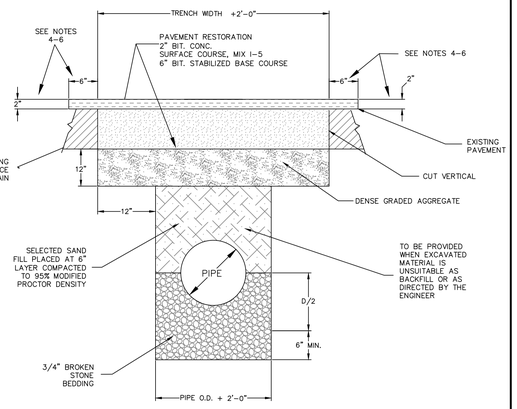
Project
UNIVERSITY CENTER PHASE 2 RENOVATION & ADDITION
SETON HALL UNIVERSITY
400 SOUTH ORANGE AVENUE
BLOCK No. 901, LOT No. 3
TOWNSHIP OF SOUTH ORANGE VILLAGE
ESSEX COUNTY NEW JERSEY

Drawing Title
CONSTRUCTION DETAILS II

Project No.	Drawing No.
100898001	CS502
Date: 12/17/2020	
Drawn By: BMW	
Checked By: JED	

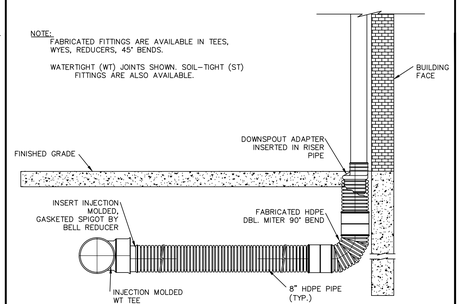
Date: 12/17/2020 Time: 14:37 User: etriscari Style Table: Langan.stb Layout: Layout1 Document Code: 100898001-0501-CS501-0102

LANGAN
Project No. 100898001

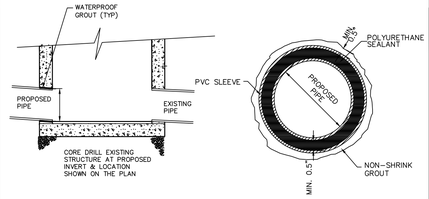


NOTE
1. SUBBASE SHALL BE FIRM AND APPROVED BY THE ENGINEER OR HIS REPRESENTATIVE PRIOR TO POURING.
2. ALL CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM TO LATEST NJDOT STANDARDS, SPECIFICATIONS AND INSPECTIONS.
3. CONTRACTOR MUST PROVIDE SQUARE AND UNIFORM PAVEMENT CUT PRIOR TO PAVEMENT REPLACEMENT.
4. REMOVE: 6" WIDTH AND 2" THICK TOP SURFACE LAYER BEYOND TRENCH WIDTH.
5. CONSTRUCT: TACK COAT ALONG VERTICAL AND HORIZONTAL SURFACES.
6. CONSTRUCT: 2" THICK BITUMINOUS CONCRETE SURFACE COURSE AND ROLL IT PROPERLY.
7. BACKFILL BENEATH PAVEMENT SHOULD BE DENSE GRADED AGGREGATE.

PIPE INSTALLATION AND PAVEMENT RESTORATION

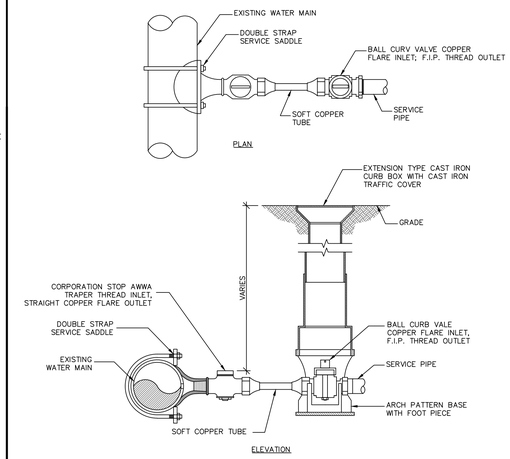


DOWNSPOUT CONNECTION

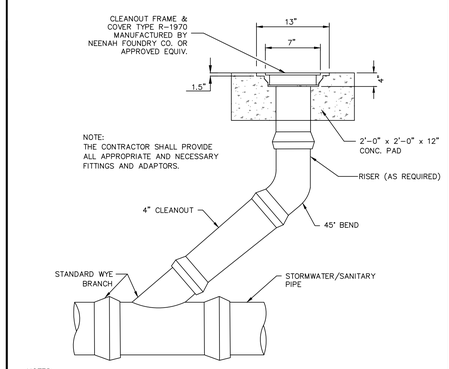


NOTES:
1. CORE-DRILL OPENING IN EXISTING WALL TO ACCOMMODATE PVC SLEEVE WITH MIN. 0.5" CLEARANCE ALL AROUND.
2. SET SLEEVE IN POSITION USING NON-SHRINK GROUT TO ASTM 1107 (SIKA GROUT 212, MANUFACTURED BY SIKA, OR APPROVED EQUIVALENT).
3. PRIOR TO GROUT SETTING, SET UTILITY IN POSITION.
4. SEAL USING POLYURETHANE SEALANT (SIKA FLEX-2C-NF/SL SEALANT, OR APPROVED EQUIVALENT), APPLIED FROM EITHER END TO FILL SLEEVE.
5. CONTROL WATER LEVELS AND KEEP CONNECTION DRY FROM INITIAL CORE-DRILLING TO END OF RECOMMENDED SET TIME OF POLYURETHANE SEALANT.

UTILITY CONNECTION TO EXISTING STRUCTURE

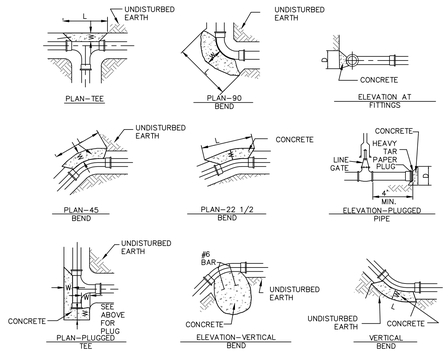


WATER MAIN CONNECTION



NOTES:
1. FOR USE IN LAWN AND LANDSCAPE AREAS.
2. REFER TO MEP DRAWINGS FOR CLEANOUTS WITHIN SIDEWALKS.

CLEAN OUT



THRUST BLOCK SCHEDULE

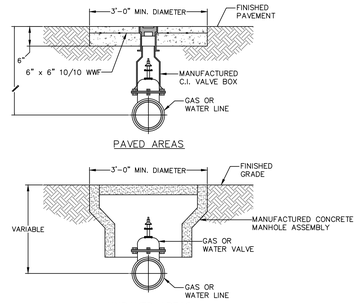
PIPE	TEE		22 1/2		45		90		
SIZE	L	D	L	D	L	D	L	D	W
6"	18"	15"	12"	15"	12"	15"	15"	15"	21"
8"	2'	18"	18"	12"	18"	12"	2'	18"	2'
12"	3'	2'	2'	12"	2'	12"	3'	2'	28"
16"	4'	2.5'	2'	12"	2.33	15"	4'	2.5'	31"
20"	5.25	3'	2'	18"	3'	2'	5.25	3'	33"
24"	7.5'	3'	3'	18"	4'	2.5'	7.5'	3'	3'

BASIS:
2,500 LB/SQ.FT. SOIL RESISTANCE 100 PSI
WATER PRESSURE CORRECTION FACTORS FOR OTHER SOILS:

SOFT CLAY	4
SAND	2
SAND & GRAVEL	1.33
SHALE	0.4

NOTE:
1. IF SOFT MATERIALS ARE ENCOUNTERED, THE THRUST BLOCKS SIZES SHALL BE ADJUSTED ACCORDINGLY.
2. CONCRETE TO BE 4000 PSI.

WATER MAIN THRUST BLOCKS



NOTE:
WORD "WATER" OR "GAS" CAST INTO CENTER OF CAST IRON CAP OR CONCRETE LID.

WATER VALVE BOX

Date	Description	No.
Revisions		

Signature — Date 12/17/2020
LEONARD D. SAVINO
PROFESSIONAL ENGINEER NJ LIC. No. 39238

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400 SOUTH ORANGE AVENUE
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TOWNSHIP OF SOUTH ORANGE VILLAGE
ESSEX COUNTY NEW JERSEY

Drawing Title
CONSTRUCTION DETAILS III

Project No. 100898001
Date 12/17/2020
Drawn By BMW
Checked By JED

Drawing No. CS503

Date: 12/17/2020 Time: 11:55 User: etriscari Style Table: Langan.stb Layout: Layout1 Document Code: 100898001-0501-CS501-0103

LANGAN
Project No. 100898001

ATTACHMENTS

MAINTENANCE INSPECTION FOR CONVEYANCE SYSTEMS

UNIVERSITY CENTER
SETON HALL UNIVERSITY
SOUTH ORANGE, NEW JERSEY

NOTE: INSPECTIONS TO BE EVALUATED DURING A PERIOD OF DRY AND WARM WEATHER AND LOW TIDE CONDITIONS AT THE PROJECT SITE

Yes	No	Maintenance Evaluation	Action(s) Required if Answer "Yes"
❑	❑	Is there a buildup of sediment (in excess of 2 inches), trash, debris or any other stormwater pollution?	Remove sediment and evaluate on-site upstream systems. Dispose debris in accordance with local, state and federal requirements.
❑	❑	Is there standing water?	Evaluate downstream systems for clogging or trash sediment buildup.
❑	❑	Is there any structural failure?	Consult engineer to determine safety and/or stability of the system.
❑	❑	Are there visible signs of cracking, subsidence, erosion or deterioration of any of the storm conveyance systems?	Consult engineer to determine safety and/or stability of the system.
❑	❑	Are there any root intrusions or any other vegetation within catch basins, outlet control structures or storm manholes?	Remove roots and dispose vegetation in accordance with local, state and federal requirements.
❑	❑	Are ladder rungs in manholes or outlet structures damaged, missing or misaligned?	Repair or replace.
❑	❑	Are and covers or grates missing, damaged or only partially in place at any catch basin, outlet control structure or manhole?	Repair or replace.

MAINTENANCE LOG
FOR CONVEYANCE SYSTEMS

UNIVERSITY CENTER
SETON HALL UNIVERSITY
SOUTH ORANGE, NEW JERSEY

INSTRUCTIONS:
THIS LOG SHALL BE UPDATED TO INCLUDE ALL MAINTENANCE PERFORMED AT A SPECIFIC STORMWATER MEASURE.

DATE	PERSON CONDUCTING MAINTENANCE	AREA OF MAINTENANCE	PROBLEM(S) FOUND	ACTION(S) TAKEN

MAINTENANCE CHECKLIST FOR UNDERGROUND DETENTION FACILITY

UNIVERSITY CENTER
SETON HALL UNIVERSITY
SOUTH ORANGE, NEW JERSEY

NOTE: INSPECTIONS TO BE EVALUATED DURING A PERIOD OF DRY AND WARM WEATHER AND LOW TIDE CONDITIONS AT THE PROJECT SITE

Yes	No	Maintenance Evaluation	Action(s) Required if Answer "Yes"
❑	❑	Is there a buildup of sediment (in excess of two inches), trash, debris or any other stormwater pollution within the header pipes, outlet structure or oversized manholes.	Remove sediment, trash, debris, etc. Dispose debris in accordance with local, state and federal requirements.
❑	❑	Is there any structural failure to the header and lateral pipes?	Consult engineer to determine safety and stability of the system.
❑	❑	Are there visible signs of cracking (wider than half an inch), damage or deterioration on the outlet structure or oversized manholes?	Consult engineer to determine safety and stability of the system.
❑	❑	Are there any signs of unusual color, odor or turbidity within the discharged water?	Evaluate upstream header pipes and structures for possible sediment, trash and debris. Cleanse system if any of the aforementioned obstructions are encountered. Dispose obstructions in accordance with local, state and federal requirements.
❑	❑	Are there root intrusions or any other plant growth occurring with the system(s)?	Remove vegetation and dispose in accordance with local, state and federal requirements.
❑	❑	Are mosquito or other insect habitats consistently present in the area as a result of the structure(s)?	Use appropriate mosquito insecticides or agents to control or eliminate insect breeding.

MAINTENANCE LOG FOR UNDERGROUND DETENTION FACILITY

UNIVERSITY CENTER
SETON HALL UNIVERSITY
SOUTH ORANGE, NEW JERSEY

INSTRUCTIONS:
THIS LOG SHALL BE UPDATED TO INCLUDE ALL MAINTENANCE PERFORMED AT A SPECIFIC STORMWATER MANAGEMENT MEASURE.

DATE	PERSON CONDUCTING MAINTENANCE	AREA OF MAINTENANCE	PROBLEM(S) FOUND	ACTION(S) TAKEN

RECORD OF ANNUAL EVALUATION OF THE EFFECTIVENESS OF THE PLAN

UNIVERSITY CENTER
SETON HALL UNIVERSITY
SOUTH ORANGE, NEW JERSEY

NOTE: EVALUATION TO BE CONDUCTED DURING A PERIOD OF DRY AND WARM WEATHER AND LOW TIDE CONDITIONS AT THE PROJECT SITE

Evaluator(s)	Date of Evaluation	Decision
		__Maintain current version OR __Revise current version Revision date _____ (also update the last revision date on the cover page)
		__Maintain current version OR __Revise current version Revision date _____ (also update the last revision date on the cover page)
		__Maintain current version OR __Revise current version Revision date _____ (also update the last revision date on the cover page)
		__Maintain current version OR __Revise current version Revision date _____ (also update the last revision date on the cover page)