BARBEE CHAPEL APARTMENTS

5101 BARBEE CHAPEL RD
CHAPEL HILL, NC 27517

CONDITIONAL ZONING PERMIT DRAWINGS

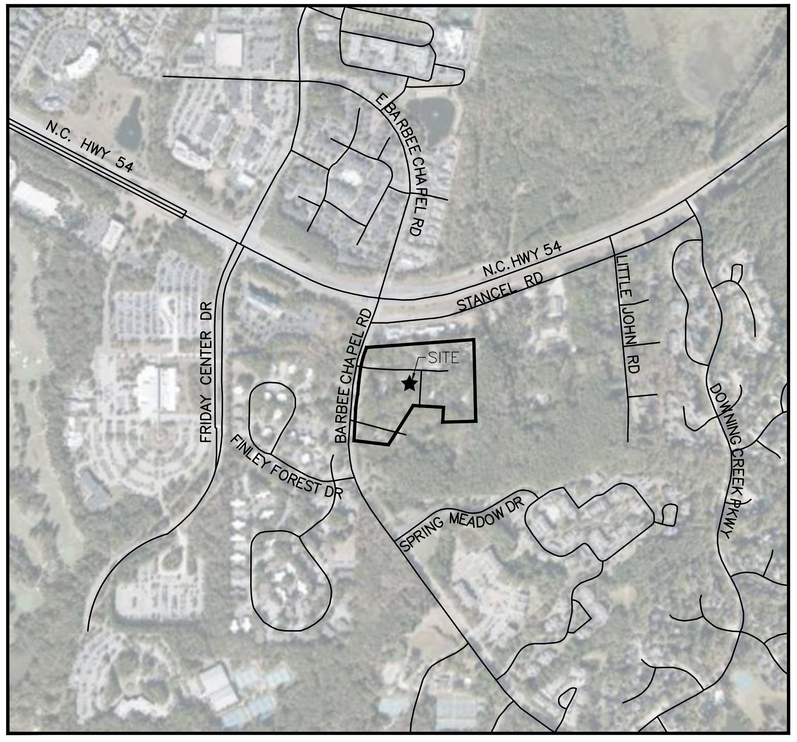
PROJECT NUMBER: TLA-22001

DATE: SEPTEMBER 29, 2022

REVISED:FEBRUARY 21, 2023

SITE DATA

PIN	9798-04-72-8235, 9798-04-72-7580, 9798-04-72-9483, 9798-04-72-9596, 9798-04-82-2404, 9798-04-82-2505, 9798-04-82-3481, 9798-04-82-1515, 9798-04-72-9722, 9798-04-82-4628	
SITE AREA	455,841 SF / 10.46 AC	
GROSS LAND AREA	455,841 SF + 10%(455,841 SF) = 501,425 SF / 11.51 AC	
ZONING	EXISTING	R-2
	PROPOSED	R-6
RIVER BASIN	CAPE FEAR	
WATERSHED	JORDAN LAKE - UPPER NEW HOPE	
WATERSHED PROTECTION	JORDAN LAKE WATERSHED, F/J-B	
EXISTING USE	SINGLE FAMILY	
PROPOSED USE	MULTI-FAMILY	
UNITS	PROPOSED	326 MULTI-FAMILY UNITS 24 TOWNHOME UNITS 350 TOTAL UNITS
DENSITY	PROPOSED	31 UNITS/ACRE
IMPERVIOUS	EXISTING	1.69 AC (14.7% OF GLA)
	MAX ALLOWED	8.06 AC (70.0% OF GLA)
BUILDING HEIGHT	ALLOWED	39'
	PROPOSED	60'
RECREATION SPACE	REQUIRED	0.05 * 501,425 SF = 25,071 SF
	PROPOSED	25,071 SF
VEHICULAR PARKING	REQUIRED	
	STUDIO	MIN 1 PER UNIT, MAX 1.25 PER UNIT
	1-BED	MIN 1 PER UNIT, MAX 1.25 PER UNIT
	2-BED	MIN 1.4 PER UNIT, MAX 1.75 PER UNIT
	3-BED	MIN 1.75 PER UNIT, MAX 2.25 PER UNIT
	PROPOSED	PER LUMO
EV PARKING	PROPOSED	> 5% OF PROPOSED PARKING
BIKE PARKING	REQUIRED	1 PER 4 UNITS
	PROPOSED	PER LUMO
SETBACKS	REQUIRED	STREET = 20' INTERIOR = 10' SOLAR = 8'
	PROPOSED	STREET = 20' INTERIOR = 8' SOLAR = 6'
BUFFERS	REQUIRED	NORTH: 20' TYPE C EAST/SOUTH: 10' TYPE B WEST: 20' TYPE C
	PROPOSED	NORTH: 6' MODIFIED EAST: 8-10' MODIFIED SOUTH: 4-10' MODIFIED WEST: 10-15' MODIFIED
DISTURBED AREA	480,000 SF (11.0 AC)	



VICINITY MAP

1" = 500'

SHEET INDEX

C0.00 PROJECT NOTES
C0.01 AREA MAP
C1.00 EXISTING CONDITIONS
C1.01 STEEP SLOPES PLAN
C2.00 SITE PLAN
C2.01 SOLID WASTE PLAN
C2.02 FIRE PROTECTION PLAN
C3.00 GRADING PLAN
C4.00 UTILITY PLAN
C7.00 CONSTRUCTION MANAGEMENT PLAN
C8.00 SITE DETAILS
C9.00 SCM A PLAN VIEW
C9.01 SCM B PLAN VIEW

ADDITIONAL SHEETS BY OTHERS

L1.00 OVERALL SITE PLAN
L1.01 PLANTING PLAN ZONE 01
L1.02 PLANTING PLAN ZONE 02
L1.03 PLANTING PLAN ZONE 03
L1.04 PLANTING DETAILS AND PLANTING SCHEDULE
L2.00 TREE PROTECTION PLAN
A1.00 SITE PLAN
A2.00 BUILDING ELEVATIONS
A2.01 BLDG ELEVATIONS
A2.02 TOWNHOME ELEVATIONS

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

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REVISIONS

NO.	DATE	
1	11.23.2022	REVISED PER 1ST CZP COMMENTS
2	02.21.2023	REVISED PER 2ND CZP COMMENTS
3		
4		
5		
6		

CONDITIONAL ZONING PERMIT DRAWINGS FOR:
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5101 BARBEE CHAPEL RD
CHAPEL HILL, NC 27517
PROJECT NUMBER: TLA-22001

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ORANGE COUNTY SOLID WASTE STANDARD PLAN NOTES (CONSTRUCTION WASTE):

1. ALL EXISTING STRUCTURES 500 SQUARE FEET AND LARGER SHALL BE ASSESSED PRIOR TO THE ISSUANCE OF A DEMOLITION PERMIT TO ENSURE COMPLIANCE WITH THE COUNTY'S REGULATED RECYCLABLE MATERIALS ORDINANCE (RRMO) AND TO ASSESS THE POTENTIAL FOR DECONSTRUCTION AND/OR THE REUSE OF SALVAGEABLE MATERIALS. CONTACT THE ORANGE COUNTY SW ENFORCEMENT OFFICER AT 919-968-2788 TO ARRANGE FOR THE ASSESSMENT.
2. PURSUANT TO THE COUNTY'S RRMO, CLEAN WOOD WASTE, SCRAP METAL, AND CORRUGATED CARDBOARD PRESENT IN CONSTRUCTION OR DEMOLITION WASTE MUST BE RECYCLED.
3. PURSUANT TO THE COUNTY'S RRMO, ALL HAULERS OF MIXED CONSTRUCTION AND DEMOLITION WASTE WHICH INCLUDES ANY REGULATED RECYCLABLE MATERIALS SHALL BE LICENSED BY ORANGE COUNTY.
4. PRIOR TO ANY DEMOLITION OR CONSTRUCTION ACTIVITY ON THE SITE, THE APPLICANT SHALL HOLD A PRE-DEMOLITION/PRE-CONSTRUCTION CONFERENCE WITH SOLID WASTE STAFF. THIS MAY BE THE SAME PRE-CONSTRUCTION MEETING HELD WITH OTHER DEVELOPMENT/ENFORCEMENT OFFICIALS.
5. THE PRESENCE OF ANY ASBESTOS CONTAINING MATERIALS ('ACM') AND/OR OTHER HAZARDOUS MATERIALS SHALL BE HANDLED IN ACCORDANCE WITH ANY AND ALL LOCAL, STATE, AND FEDERAL REGULATIONS AND GUIDELINES.

LANDSCAPE PROTECTION NOTES:

1. PLAN SHOWS RARE AND SPECIMEN TREES IN ACCORDANCE WITH THE ORDINANCE THAT WAS IN EFFECT AT THE TIME OF APPROVAL.
2. LANDSCAPING SHALL BE COORDINATED TO PRESERVE EXISTING TREES AS MUCH AS POSSIBLE. CONFLICTS BETWEEN PROPOSED PLANTINGS AND EXISTING TREES SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR REMEDIATION.
3. ALL IRRIGATION SYSTEMS SHALL BE EQUIPPED WITH AUTOMATIC CONTROLLERS THAT ACTIVATE THE SYSTEM ACCORDING TO A DESIRED FREQUENCY AND DURATION, AND SHALL ALSO BE EQUIPPED WITH RAIN OR SOIL MOISTURE SENSORS THAT WILL PREVENT IRRIGATION DURING PERIODS OF RAINFALL OR WHEN THERE IS SUFFICIENT MOISTURE IN THE GROUND FOR PLANT HEALTH AND SURVIVAL IN ACCORDANCE WITH THE LOCAL GOVERNMENT WATER CONSERVATION ORDINANCES.

PAVEMENT MARKING/SIGNAGE NOTES:

1. ALL SIGNAGE SHALL BE COORDINATED WITH THE TOWN OF CHAPEL HILL.
2. ALL SIGNAGE SHALL MEET MUTCD STANDARDS AND SPECIFICATIONS.
3. ALL SIGNAGE SHALL MEET NCDOT PEDESTRIAN SAFETY SPECIFICATIONS.
4. ALL CONSTRUCTION SHALL CONFORM TO THE LATEST NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) AND/OR TOWN OF CHAPEL HILL STANDARDS AND SPECIFICATIONS.
5. ALL SIGNS SHALL BE PRISMATIC AND ADHERE TO THE MINIMAL RETROREFLECTIVITY STANDARDS FOUND IN THE LATEST VERSION OF THE MUTCD.
6. ALL PAVEMENT MARKINGS ON PUBLIC STREETS SHALL BE THERMOPLASTIC AND ARE TO BE PLACED PER NCDOT STANDARDS (REFERENCE 2012 NCDOT DETAILS (1205.01~1205.12)
7. SIGN DESIGNS FOR STREET NAME SIGNS SHALL BE APPROVED BY TRANSPORTATION/ENGINEERING DEPARTMENT STAFF TO ENSURE COMPLIANCE WITH MUTCD SPECIFICATIONS. DESIGNS MUST BE APPROVED BY TOWN STAFF PRIOR TO ACCEPTANCE OF STREETS OR ISSUANCE OF 1ST CO.
8. ALL STREET NAME SIGNS SHALL CONFORM TO THE LATEST EDITION OF THE MUTCD INCLUDING MIXED CASE LETTERING, PROPOPER LETTER HEIGHTS, AND RETROREFLECTIVITY.

CONSTRUCTION MANAGEMENT NOTES:

1. ALL LARGE TRUCKS AS RELATED TO VEHICULAR CONSTRUCTION TRAFFIC SHALL ENTER/LEAVE THE SITE THROUGH THE TEMPORARY CONSTRUCTION ENTRANCES & EXITS AS SHOWN ON THIS PLAN. LANE CLOSURES SHALL BE ESTABLISHED AS SHOWN ON THIS PLAN AND CONSTRUCTION PERSONNEL SHALL BE IN ATTENDANCE TO MANAGE AND DIRECT VEHICULAR AND PEDESTRIAN TRAFFIC.
2. ENTRANCE AND EXIT GATES SHALL BE CLOSED UNLESS CONSTRUCTION OR DELIVERY VEHICLES ARE ENTERING OR EXITING THE CONSTRUCTION SITE.
3. THE CONTRACTOR SHALL PROVIDE WORK ZONE TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH ALL APPLICABLE NCDOT STANDARDS. REFER TO THE TRAFFIC AND PEDESTRIAN CONTROL PLAN FOR SPECIFIC NOTES AND DETAILS.
4. NO OPEN BURNING SHALL BE PERMITTED.
5. THE APPLICANT SHALL POST A CONSTRUCTION SIGN ON THE DEVELOPMENT SITE THAT LISTS THE FOLLOWING:
   - PROPERTY OWNER'S REPRESENTATIVE & TELEPHONE NUMBER
   - CONTRACTOR'S REPRESENTATIVE & TELEPHONE NUMBER
   - TELEPHONE NUMBER FOR REGULATORY INFO AT TIME OF BUILDING PERMIT
   - SIGN MAY BE A MAXIMUM OF 32 SF AND A MAXIMUM HEIGHT OF 8 FT.
8. FENCING AROUND PROJECT SHALL INCLUDE ACCESS GATES WITH A 20-FOOT SWING OR SLIDE MOTION.
9. CONSTRUCTION FENCE SHALL BE MODIFIED AS REQUIRED DURING CONSTRUCTION PHASING FOR PEDESTRIAN CIRCULATION.
10. PRIOR TO ANY TRAFFIC LANE AND/OR SIDEWALK CLOSURES, THE APPLICANT SHALL CONTACT THE CHAPEL HILL TRAFFIC ENGINEERING OFFICE (919-969-5096 OR 919-969-5100) AT LEAST 5 WORKING DAYS BEFORE THE PROPOSED WORK TO APPLY FOR A LAND CLOSURE PERMIT.
11. ROAD CLOSURES ON PUBLIC STREETS MUST BE COORDINATED WITH AND APPROVED BY THE TOWN OF CHAPEL HILL.
12. TEMPORARY STREET ROAD SIGNS ARE REQUIRED AT EACH STREET INTERSECTION WHEN CONSTRUCTION OF NEW ROADS ALLOWS FOR THE PASSAGE OF VEHICLES. SIGNS SHALL BE OF APPROVED SIZE, WEATHER RESISTANT AND BE MAINTAINED UNTIL REPLACED BY PERMANENT SIGNS.
13. CONTRACTOR TO PROVIDE DEDICATED ONSITE PARKING SPACES FOR INSPECTORS AT EACH BUILDING AND NEAR THE JOB TRAILER FOR THE DURATION OF CONSTRUCTION
14. ROADS WITH CURB AND GUTTER AND THE FIRST LIFT OF ASPHALT WILL NEED TO BE CONSTRUCTED BEFORE COMBUSTIBLES ARE ON SITE IN ORDER TO MEET REQUIREMENTS FROM FIRE CODE, STORMWATER, AND OWASA. HYDRANTS SHALL BE ACTIVE IN THE AREAS FOR CONSTRUCTION.

GENERAL NOTES:

1. CONTRACTOR TO NOTIFY SURROUNDING PROPERTIES 7 DAYS PRIOR TO STARTING CONSTRUCTION.
2. CONTRACTOR TO PROVIDE NOTICE TO THE TOWN OF CHAPEL HILL REGARDING SPECIFIC DATES FOR ANY NECESSARY ROAD CLOSURES AND LANE REDUCTIONS.
3. GENERAL CONTRACTOR TO COORDINATE WITH SPECIFIC PROPERTIES AFFECTED BY THE PROPOSED ROAD CLOSURES IF REQUIRED TO ENSURE CONTINUOUS ACCESS TO THE AFFECTED PROPERTIES.
4. ALL SHOWN PARKING SPACE MARKINGS SHALL BE PER THE TOWN OF CHAPEL HILL CODE FOR PARKING LOTS.
5. MINIMUM CORNER CLEARANCES FROM THE CURBLINE OF INTERSECTING STREETS SHALL BE AT LEAST 20' FROM THE POINT OF TANGENCY. NO DRIVEWAYS OR PARKING SPACES SHALL ENCROACH ON THIS MINIMUM CORNER CLEARANCE.
6. WITHIN THE SIGHT DISTANCE TRIANGLES SHOWN, NO OBSTRUCTION BETWEEN 2' AND 8' IN HEIGHT ABOVE THE CURB LINE ELEVATION SHALL BE LOCATED IN WHOLE OR IN PART. OBSTRUCTIONS INCLUDE BUT ARE NOT LIMITED TO ANY BERM, FOLIAGE, FENCE, WALL, SIGN, OR PARKED VEHICLE.
7. ALL CONSTRUCTION SHALL CONFORM TO THE LATEST TOWN OF CHAPEL HILL, NCDOT AND OWASA STANDARDS AND SPECIFICATIONS.
8. ALL DIMENSIONS SHOWN ON SITE PLAN ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
9. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS FOR EXCAVATIONS; FINAL RULE 29CFR PART 1926, SUBPART "P" APPLIES TO ALL EXCAVATIONS EXCEEDING FIVE (5) FEET IN DEPTH. EXCAVATION EXCEEDING TWENTY (20) FEET IN DEPTH REQUIRES THE DESIGN OF A TRENCH SAFETY SYSTEM BY A REGISTERED PROFESSIONAL ENGINEER, PROVIDED BY CONTRACTOR RESPONSIBLE FOR EXCAVATION.
10. EQUIPMENT AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED PROVIDED APPROVAL HAS BEEN OBTAINED FROM THE OWNER IN WRITING PRIOR TO ORDERING OR INSTALLATION. THE CONTRACTOR SHALL WAIVE ANY CLAIM FOR ADDITIONAL COST RELATED TO THE SUBSTITUTION OF ALTERNATE EQUIPMENT.
11. CONTRACTOR SHALL MAINTAIN AN "AS-BUILT" SET OF DRAWINGS TO RECORD THE EXACT LOCATION OF ALL PIPING PRIOR TO CONCEALMENT. DRAWINGS SHALL BE GIVEN TO THE OWNER UPON COMPLETION OF THE PROJECT WITH A COPY OF THE TRANSMITTAL LETTER TO THE ENGINEER.
12. CONTRACTOR IS RESPONSIBLE FOR COORDINATING CONSTRUCTION ACTIVITIES WITH THE APPROPRIATE UTILITY COMPANIES FOR ANY REQUIRED RELOCATION (I.E. POWER POLES, TELEPHONE PEDESTALS, WATER METERS, ETC.).
13. PRIOR TO STARTING CONSTRUCTION, THE GENERAL CONTRACTOR SHALL SCHEDULE AND HOLD A PRE-CONSTRUCTION CONFERENCE WITH THE TOWN OF CHAPEL HILL ENGINEERING DEPARTMENT, ORANGE COUNTY SOIL AND EROSION DEPARTMENT, ENGINEER, AND OWNER/REPRESENTATIVE.
14. ALL DIMENSIONS AND GRADES SHOWN ON THE PLANS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY DISCREPANCIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION FOR NECESSARY PLAN OR GRADE CHANGES. NO EXTRA COMPENSATION SHALL BE PAID TO CONTRACTOR FOR ANY WORK DONE DUE TO DIMENSIONS OR GRADES SHOWN INCORRECTLY ON THESE PLANS IF SUCH NOTIFICATION HAS NOT BEEN GIVEN.
15. ALL STREET NAME SIGNS SHALL CONFORM TO THE LATEST EDITION OF THE MUTCD INCLUDING MIXED CASE LETTERING, PROPER LETTER HEIGHTS, AND RETROREFLECTIVITY.
16. ALL ASPHALT EDGES SHALL BE SAW CUT TO PROVIDE A GOOD LONGITUDINAL JOINT. MILL 1.5 FEET AT 1.5 INCHES DEEP MINIMUM TO PROVIDE A LONGITUDINAL LAP JOINT FOR FINAL SURFACE LAYER. NO MILLING SHALL BE LEFT FOR A PERIOD OF TIME GREATER THAN 48 HOURS BEFORE A STREET IS TO BE REPAVED/RESURFACED.
17. SEPARATE BUILDING PERMITS ARE REQUIRED FOR RETAINING WALLS, DUMPSTER ENCLOSURES, MONUMENTS, SIGNS, OR OTHER ACCESSORY STRUCTURES OR ELEMENTS.
18. EXISTING UTILITIES AND STRUCTURES SHOWN, BOTH UNDERGROUND AND ABOVE GROUND, ARE BASED ON A FIELD SURVEY AND THE BEST AVAILABLE RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS PRIOR TO BEGINNING RELATED CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE IMMEDIATELY.
19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND/OR RELOCATION OF ALL EXISTING UTILITIES IN COORDINATION WITH THE APPROPRIATE UTILITY, AGENCY, OR COMPANY.
20. EXISTING CONTOURS ARE BASED ON SURVEY COMPLETED BY SUMMIT. EXISTING UTILITIES SHOWN ARE BASED ON SURVEY AND THE BEST AVAILABLE RECORDS. THE CONTRACTOR, HOWEVER, SHALL VERIFY CONDITIONS PRIOR TO BEGINNING CONSTRUCTION. ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THE PLANS SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY. FOR NECESSARY PLAN OR GRADE CHANGES. NO EXTRA COMPENSATION SHALL BE PAID TO CONTRACTOR FOR ANY WORK DONE DUE TO DIMENSIONS OR GRADES SHOWN INCORRECTLY ON THESE PLANS IF SUCH NOTIFICATION HAS NOT BEEN GIVEN.
21. EXISTING IMPROVEMENTS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED/RESTORED TO THEIR ORIGINAL CONDITION OR TO THE SATISFACTION OF THE OWNER BY THE CONTRACTOR RESPONSIBLE FOR THE DAMAGE.
22. MECHANICAL EQUIPMENT MUST BE PLACED AT OR ABOVE THE BASE FLOOD ELEVATION PLUS 2 FEET.
23. A ZONE FOR FIRE DEPARTMENT LADDERS AND FIREFIGHTING OPERATIONS MUST BE PROVIDED, REQUIRING ALL LINES TO BE BURIED SURROUNDING STRUCTURES.
24. IF APPLICABLE, BACK WASH WATER FROM THE POOL SHALL DISCHARGE INTO THE SANITARY SEWER SYSTEM, NOT STORM SEWER, AND SHALL NOT EXCEED 50 GALLONS PER MINUTE.
25. CONTRACTOR TO CONTACT THE CHAPEL HILL STORMWATER MANAGEMENT DIVISION AT 919-969-7246 TO SCHEDULE SITE INSPECTION AT LEAST TEN (10) DAYS IN ADVANCE OF REQUESTING THE CERTIFICATE OF OCCUPANCY.
26. IMPROVEMENTS, STRUCTURES, FIXTURES, SIGNS, TABLES, CHAIRS, PLANTERS, OR ANY OTHER OBJECT SHALL NOT BE PLACED IN SIDEWALK AREAS FOR ANY PERIOD OF TIME.
27. HVAC CONDENSATE AND FLOOR DRAINS FROM THE ROOFED PARKING AREA SHALL NOT BE CONNECTED TO THE STORM SEWER SYSTEM. NO ELEVATOR SUMP PUMP DISCHARGE MAY ENTER THE STORM SEWER SYSTEM.
28. ANY ROOF DRAINS OR OTHER PLUMBING INTENDED TO DISCHARGE TO THE STORM SEWER SYSTEM NOT SHOWN ON THE APPROVED PLANS ARE NOT APPROVED. ANY DISCHARGE DIRECTED TO THE STORM SEWER SYSTEM THAT IS NOT APPROVED WILL NEED TO APPROVAL FROM THE TOWN OF CHAPEL HILL STORMWATER MANAGEMENT DIVISION.
29. THE NORTH CAROLINA DEPARTMENT OF INSURANCE SHALL REVIEW AND APPOVE ANY PROJECTS LISTED IN TABLE 104.1 OF THE NORTH CAROLINA ADMINISTRATION AND POLICIES CODE BEFORE THE TOWN OF CHAPEL HILL WILL BEGIN ITS BUIDILNG PERMIT REVIEW.
30. A SINGLE ELECTRICAL SERVICE SHALL BE PROVIDED TO SERVE THE STRUCTURE WITH THE EXCEPTION OF THE FIRE PUMP, IN ACCORDANCE WITH ARTICLE 230.2(A) OF THE 2017 NORTH CAROLINA ELECTRICAL CODE.
31. CURB AND GUTTER AND ATLEAST THE FIRST LIFT OF ASPHALT FOR THE ROADS MUST BE PLACED PRIOR TO THE START OF CONSTRUCTION.
32. PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY, THE APPLICANT SHALL PROVIDE THE MINIMUM REQUIRED HANDICAPPED PARKING SPACES AND DESIGN ALL HANDICAPPED PARKING SPACES, RAMPS, CROSSWALKS, AND ASSOCIATED INFRASTRUCTURE ACCORDING TO THE AMERICANS WITH DISABILITIES ACT STANDARDS, NORTH CAROLINA BUILDING CODE, AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) CODE, AND TOWN STANDARD.

    A. THE NUMBER OF PARKING SPACES SHALL COMPLY WITH NCBC 2018 SECTION 1106.1, 1 PER 6 COMPLIANT SPACES OR PORTION THEREOF MUST BE VAN ACCESSIBLE. NO SLOPE SHALL EXCEED 2% IN ANY DIRECTION. SIGNAGE SHALL BE PLACES IN ACCORDANCE WITH NCBC 2018 REQUIREMENTS, MUTCD AND ACC A 117.1.

    B. CURB CUTS AND ACCESSIBLE ROUTES PER ICC A117.1 2009 EDITION. CROSS SLOPE LIMITED TO 2%. CALL TOWN OF CHAPEL HILL BUILDING INSPECTIONS OFFICE FOR INSPECTION PRIOR TO PLACEMENT OF CONCRETE.

    C. SLOPES GREATER THAN 5% REQUIRES CONSTRUCTION AS A RAMP.
33. FINAL LOCATION OF GAS LINE INSTALLED BY DOMINION ENERGY TO BE VERIFIED IN FIELD PRIOR TO THE INSTALLATION OF ANY FURNISHINGS REQUIRING GAS CONNECTIONS, INCLUDING BUT NOT LIMITED TO FIRE PITS, FIRE TABLES AND OUTDOOR GRILLING STATIONS. CONTRACTOR SHALL COORDINATE WITH DOMINION ENERGY, LANDSCAPE ARCHITECT, ARCHITECT AND OWNER FOR CONNECTIONS TO GAS LINE. CONNECTIONS TO BE PROVIDED BY A LICENSED GAS FITTER/TECHNICIAN AND SHALL CONFIRM TO ALL LOCAL AND STATE REGULATIONS.

GRADING & STORM DRAINAGE NOTES:

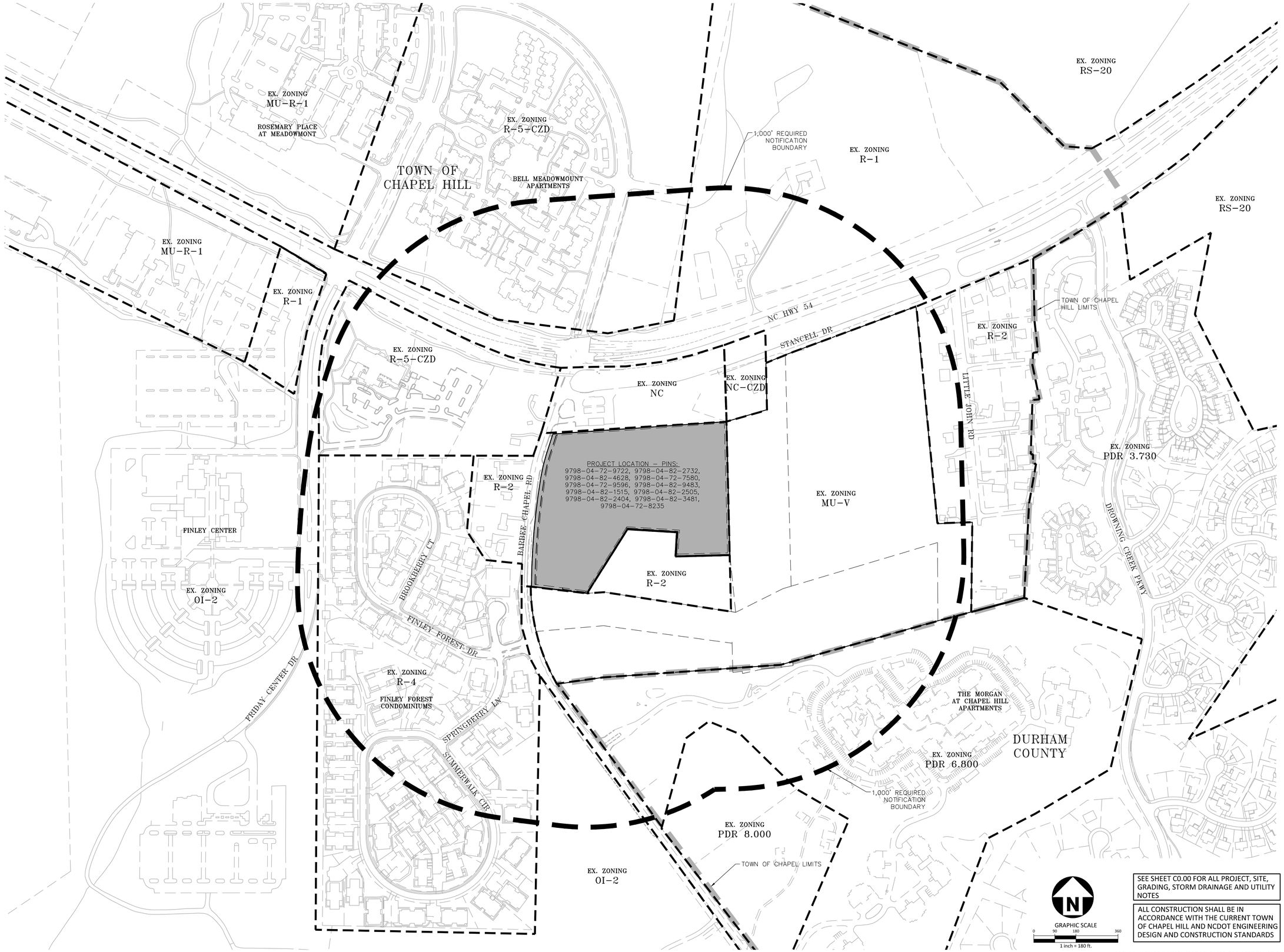
1. CONTRACTOR SHALL NOTIFY NC 811 (1-800-632-4949) AT LEAST 3 FULL BUSINESS DAYS PRIOR TO BEGINNING CONSTRUCTION OR EXCAVATION TO HAVE EXISTING UTILITIES LOCATED. CONTRACTOR TO CONTACT ANY LOCAL UTILITIES THAT PROVIDE THEIR OWN LOCATOR SERVICES INDEPENDENT OF NC 811. REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
2. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL HOLD A PRE-CONSTRUCTION CONFERENCE WITH THE ORANGE COUNTY SOIL AND EROSION CONTROL OFFICER, TOWN OF CHAPEL HILL STORM WATER MANAGEMENT DIVISION, AND OWNER'S REP/ENGINEER.
3. CONTRACTOR TO CONTACT JAMES HUGGINS WITH THE TOWN OF CHAPEL HILL AT 919-969-5088 TO POST EROSION CONTROL BOND, ALONG WITH A PERFORMANCE GUARANTEE PER, PRIOR TO ANY LAND DISTURBANCE.
4. GRADING AND CONTOURS ARE BASED ON NORTH AMERICAN VERTICAL DATUM 88 (NAVD88).
5. SOIL UNDER BUILDINGS AND PAVED AREAS SHALL BE APPROVED, PLACED AND COMPACTED AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER AND SHOULD MEET OR EXCEED TOWN OF CHAPEL HILL STANDARDS.
6. GRADING IN AREAS DESIGNATED AS "ACCESSIBLE" SHALL COMPLY WITH ALL FEDERAL AND LOCAL ACCESSIBILITY RULES AND GUIDELINES. EVEN THOUGH PLANS MAY NOT SHOW ALL SPOT ELEVATIONS IN THESE REGIONS, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ASSURE THAT THE AREAS ARE GRADED TO AMERICAN DISABILITY ACT (ADA) COMPLIANT SPECIFICATIONS.
7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY AREAS WHERE SPILL CURB IS NECESSARY TO CONVEY RUNOFF TO THE NEAREST CATCH BASIN OR DROP INLET. THE OWNER AND/OR ENGINEER SHALL NOT BE HELD RESPONSIBLE FOR CURBING INSTALLED PRIOR TO PAVING THAT DOES NOT DRAIN PROPERLY.
8. ALL PROPOSED INLETS, CATCH BASINS, AND DROP INLETS SHALL BE PROTECTED BY EROSION CONTROL MEASURES AS SHOWN AND SPECIFIED ON THE EROSION CONTROL PLAN
9. THE CURB INLETS AND YARD INLETS SHALL BE CONSTRUCTED IN THE LOCATIONS SHOWN UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR REPORTING ANY DISCREPANCIES IN THE CATCH BASIN ELEVATIONS OR THE PROPOSED PIPE SLOPES TO THE ENGINEER. THE CONTRACTOR IS ALSO RESPONSIBLE TO REPORT ANY CONFLICTS BETWEEN ANY UTILITY, STORM DRAIN LINE, WATER LINE, SEWER LINE OR ANY OTHER PROPOSED OR EXISTING STRUCTURE TO THE ENGINEER.
10. THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM ALL BUILDING FOUNDATIONS. THE CONTRACTOR SHALL FIELD VERIFY GRADES SURROUNDING ALL BUILDINGS PRIOR TO GRADING ACTIVITIES AND REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
11. PIPE SPECIFIED AS RCP MAY BE SUBSTITUTED IF APPROVED BY THE TOWN OF CHAPEL HILL WITH APPROVED MATERIALS PER THE TOWN OF CHAPEL HILL STANDARDS AND SPECIFICATIONS OUTSIDE OF PUBLIC RIGHT OF WAY AND EASEMENTS. ALL BEDDING FOR ALTERNATE MATERIALS SHALL CONFORM TO NCDOT, AASHTO AND ASTM SPECIFICATIONS.
12. THE MINIMUM PIPE SIZE WITHIN A PUBLIC RIGHT-OF-WAY IS 15".
13. FOR ALL PIPE OUTLETS 60" AND GREATER (SINGLE) AND 36" (MULTIPLE) HEADWALLS/ENDWALLS SHALL BE USED AND A 4' HIGH BLACK POLY COATED CHAIN LINK FENCE PLACED OVER THE WALL.
14. FOR NPDES PERMIT COMPLIANCE: ALL SLOPES 3:1 AND STEEPER MUST BE STABILIZED WITHIN 7 DAYS, ALL OTHER AREAS MUST BE STABILIZED WITHIN 14 DAYS.
15. ALL STORM PIPE SPECIFIED AS REINFORCED CONCRETE (RCP) SHALL BE MINIMUM CLASS III PIPE.
16. ALL STORM PIPE SHALL BE LAID AT LEAST 10' HORIZONTALLY OR 18" VERTICALLY FROM ANY WATER MAIN AND 24" VERTICALLY FROM ANY SEWER MAIN. REFER TO NCAC 02T RULES FOR EXEMPTIONS.
17. GEOTEXTILE FABRIC OR APPROVED EQUIVALENT ARE REQUIRED AT ALL DISSIPATOR PADS.

FIRE DEPARTMENT NOTES:

1. SITE SHALL COMPLY WITH THE LATEST NATIONAL BUILDING AND FIRE CODES.
2. FUNCTIONAL FIRE PROTECTION SHALL BE PROVIDED PRIOR TO THE ARRIVAL OF COMBUSTIBLE MATERIALS ON THE SITE.
3. FIRE ACCESS ROUTE SHALL HAVE A MINIMUM RADIUS OF 28' (FACE OF CURB) TO ALLOW FIRE APPARATUS ACCESS THROUGH SITE (IFC 503.2.4).
4. ANY GATES ACROSS FIRE APPARATUS ACCESS ROADS SHALL BE A MINIMUM WIDTH OF 20', BE OF SWINGING OR SLIDING TYPE AND HAVE AN EMERGENCY MEANS OF OPERATION. ALL GATES IN FIRE TRUCK APPARATUS ACCESS ROUTES SHALL BE OPERABLE BY EITHER FORCIBLE ENTRY OR KEYED AND MUST BE CAPABLE OF BEING OPERATED BY ONE PERSON. ALL GATES IN FIRE TRUCK APPARATUS ACCESS ROUTES SHALL BE INSTALLED AND MAINTAINED ACCORDING TO UL375 AND ASTM F2200.
5. ALL PORTIONS OF THE FIRST FLOOR OF THE BUILDING MUST BE WITHIN 150' OF THE FIRE ACCESS ROUTE (IFC 503.1.1), UNLESS OTHERWISE APPROVED BY THE FIRE MARSHALL.
6. BUILDING ADDRESSES SHALL BE PLACED ON BOTH SIDES OF THE BUILDING ON A CLEARLY VISIBLE PLACARD FOR LOCATION PURPOSES.
7. ALL FIRE TRUCK ACCESSIBLE ROUTES SHALL BE RATED FOR 80,000 LB AND HAVE A MINIMUM CLEAR WIDTH OF 26' (IFC 503.2.1) UNLESS OTHERWISE APPROVED BY THE FIRE MARSHALL.
8. FIRE RISER ROOM SHALL BE EQUIPPED WITH AN EXTERNAL LOCK BOX.
9. RISER ROOM SHALL HAVE ADEQUATE DRAINAGE FOR EMERGENCY RPZ DISCHARGE.
10. PRIVATE FIRE SERVICE MAINS AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 24, NC FPC 507.2.1.
11. ALL CONSTRUCTION AND DEMOLITION CONDUCTED SHALL BE IN COMPLIANCE WITH THE CURRENT EDITION OF 2018 NC FIRE CODE CHAPTER 33.
12. OPEN BURNING OF TREES, LIMBS, STUMPS, AND CONSTRUCTION DEBRIS ASSOCIATED WITH THIS DEVELOPMENT IS PROHIBITED.
13. DURING CONSTRUCTION, VEHICLE ACCESS FOR FIRE FIGHTING SHALL BE PROVIDED. TEMPORARY STREET SIGNS SHALL BE INSTALLED AT EACH STREET INTERSECTION WHEN CONSTRUCTION ALLOWS PASSAGE OF VEHICLES. SIGNS SHALL BE OF AN APPROVED SIZE, WEATHER RESISTANCE AND MAINTAINED UNTIL REPLACED BY PERMANENT SIGNS.
14. THE OWNER/DEVELOPER SHALL DESIGNATE ONE PERSON TO BE THE FIRE PREVENTION PROGRAM SUPERINTENDENT WHO SHALL BE RESPONSIBLE FOR ENFORCING CHAPTER 14 OF THE NCFPC AND THE ON-SITE FIRE PREVENTION PROGRAM AND ENSURE THAT IT IS CARRIED OUT THROUGH COMPLETION OF THE PROJECT.
15. A WORKING SPACE OF NOT LESS THAN 36" IN WIDTH AND DEPTH AND 78" IN HEIGHT SHALL BE PROVIDED ON ALL SIDES EXCEPT FOR WALL MOUNTED FDC'S UNLESS OTHERWISE APPROVED BY THE FIRE CODE OFFICIAL. THE FDC'S WHERE REQUIRED MUST BE PHYSICALLY PROTECTED BY AN APPROVES BARRIER FROM IMPACTS.
16. ANY REQUIRED FDC'S FOR ANY BUILDING SHALL MEET THE DESIGN AND INSTALLATION REQUIREMENTS FOR THE CURRENT, APPROVED EDITION OF NFPA 13, 13D, 13R, OR 14 OF THE NCFC 2018 AND TOWN ORDINANCES; 7-38 FOR LOCATIONS. FDC'S SHALL BE INSTALLED ON THE STREET/ADDRESS SIDE OF THE BUILDING AND WITHIN 100' OF A HYDRANT OR UNLESS OTHERWISE APPROVED BY THE FIRE CODE OFFICIAL AND SHALL NOT BE OBSTRUCTED OR HINDERED BY PARKING OR LANDSCAPING.
17. WHERE A FIRE HYDRANT IS LOCATED ON A FIRE APPARATUS ACCESS ROAD, THE MINIMUM ROAD WIDTH SHALL BE 26 FEET (7925 mm), EXCLUSIVE OF SHOULDERS (SEE FIGURE D103.1).
18. FIRE APPARATUS ACCESS ROADS SHALL NOT BE OBSTRUCTED IN ANY MANNER, INCLUDING THE PARKING OF VEHICLES. THE MINIMUM WIDTHS AND CLEARANCES ESTABLISHED IN SECTIONS 503.2.1 AND 503.2.2 SHALL BE MAINTAINED AT ALL TIMES. 2018 NCFC 503.4 (FIRE)
19. WHERE REQUIRED BY THE FIRE CODE OFFICIAL, APPROVED SIGNS OR OTHER APPROVED NOTICES OR MARKINGS THAT INCLUDE THE WORDS NO PARKING-FIRE LANE SHALL BE PROVIDED FOR FIRE APPARATUS ACCESS ROADS TO IDENTIFY SUCH ROADS OR PROHIBIT THE OBSTRUCTION THEREOF. THE MEANS BY WHICH FIRE LANES ARE DESIGNATED SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION AT ALL TIMES AND BE REPLACED ORE REPAIRED WHEN NECESSARY TO PROVIDE ADEQUATE VISIBILITY. 2018 NCFC SECTION 503.3 AND APPENDIX D D 103.6, D 103.6.1, D 103.6.2.
20. THE FIRE CODE OFFICIAL IS AUTHORIZED TO REQUIRE THE INSTALLATION AND MAINTENANCE OF GATES OR OTHER APPROVED BARRICADES ACROSS FIRE APPARATUS ACCESS ROADS, TRAILS, OR OTHER ACCESSWAYS; NOT INCLUDING PUBLIC STREETS, ALLEYS, OR HIGHWAYS. ELECTRIC GATE OPERATORS, WHERE PROVIDED, SHALL BE LISTED IN ACCORDANCE WITH UL 325. GATES INTENDED FOR AUTOMATIC OPERATION SHALL BE DESIGNED, CONSTRUCTED, AND INSTALLED TO COMPLY WITH THE REQUIREMENTS OF ASTM F2200. 2018 NCFC SECTION 503 AND APPENDIX D103.
21. THE GRADE OF THE FIRE APPARATUS ACCESS ROAD SHALL BE WITHIN THE LIMITS ESTABLISHED BY THE FIRE CODE OFFICIAL BASED ON THE FIRE DEPARTMENT'S APPARATUS.
    503.2.8 ANGLES OF APPROACH AND DEPARTURE. THE ANGLES OF APPROACH AND DEPARTURE FOR FIRE APPARATUS ACCESS ROADS SHALL BE WITHIN THE LIMITS ESTABLISHED BY THE FIRE CODE OFFICIAL BASED ON THE FIRE DEPARTMENT'S APPARATUS.
    D 103.2 GRADE. FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
    EXCEPTION: GRADES STEEPER THAN 10 PERCENT AS APPROVED BY THE FIRE CHIEF. 2018 NCFC SECTION 503 AND APPENDIX D.

ORANGE WATER AND SEWER AUTHORITY UTILITY NOTES:

1. STANDARDS AND SPECIFICATIONS - ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH OWASA STANDARDS AND SPECIFICATIONS LATEST REVISED EDITION.
2. PRECONSTRUCTION CONFERENCE - A PRECONSTRUCTION CONFERENCE WITH THE OWASA CONSTRUCTION INSPECTOR IS REQUIRED BEFORE BEGINNING ANY UTILITY CONSTRUCTION.
3. PROJECT ACCEPTANCE - IN ADDITION TO A FINAL INSPECTION APPROVED BY THE OWASA CONSTRUCTION INSPECTOR, THE FOLLOWING DOCUMENTS MUST BE RECEIVED AND APPROVED BY OWASA BEFORE ACCEPTANCE OF THE PROJECT AND THE SETTING OF METERS:
   - ENGINEER'S CERTIFICATION OF PUBLIC SEWER - ORIGINAL DOCUMENT
   - ENGINEER'S CERTIFICATION OF PUBLIC WATER - ORIGINAL DOCUMENT
   - ASSET LETTER - ORIGINAL DOCUMENT
   - LETTER OF DEDICATION - ORIGINAL DOCUMENT
   - AS BUILT DRAWINGS (INCLUDING 1"=100' SCALE SITE PLAN) AS BUILTS OF SEWER CONSTRUCTION SUBJECT TO REVIEW AND APPROVAL BY NCDENR DIVISION OF WATER QUALITY.
   - MANHOLE DATA SHEETS
   - RECORDED PLAT
   - ORIGINAL RECORDED WATER AND SEWER DEEDS OF EASEMENT - PREPARED USING OWASA'S STANDARD FORM.
4. SEWER STATEMENT - SEWER LINES UNDER CONSTRUCTION SHALL BE PLUGGED WITH A MECHANICAL PLUG AT THE FIRST MANHOLE UPSTREAM FROM THE POINT OF CONNECTION. PLUG SHALL BE PLACED IN THE OUTLET CONNECTION AND SECURED WITH STEEL CABLE. PLUG SHALL REMAIN IN PLACE UNTIL ACCEPTANCE OF LINES BY OWASA. WATER, STONE, DIRT, OR ANY OTHER DEBRIS SHALL NOT BE ALLOWED TO ENTER THE OWASA SANITARY SEWER SYSTEM DURING FLUSHING OPERATIONS OR AT ANY OTHER TIME. CONSTRUCTION TAKING PLACE IN THE VICINITY OF ANY EXISTING OWASA SEWER LINES OR MANHOLES SHALL NOT CAUSE ANY INFLOW OF SURFACE WATER OR DEBRIS TO ENTER THE REMAIN ACCESSIBLE AT ALL TIMES. THE OWNER AND/OR CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES INCURRED TO THE OWASA SANITARY SEWER SYSTEM AND FINES IMPOSED BY THE STATE OF NORTH CAROLINA DIVISION OF WATER QUALITY DUE TO SEWER SPILLS OR OVERFLOWS.
5. SEWER SERVICES - SEWER SERVICES LOCATED WITHIN PUBLIC RIGHT-OF-WAY OR OWASA SEWER EASEMENTS MUST BE CONSTRUCTED O



PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

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Toll Brothers APARTMENT LIVING

BARBEE CHAPEL APARTMENTS

CONDITIONAL ZONING PERMIT

DRAWINGS

5101 BARBEE CHAPEL RD

CHAPEL HILL, NC 27517

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053078 SPENCER CHRISTIANSEN

NOT RELEASED FOR CONSTRUCTION

REVISIONS

NO.	DATE	
	11.23.2022	REVISED PER 1ST CZP COMMENTS
	02.21.2023	REVISED PER 2ND CZP COMMENTS

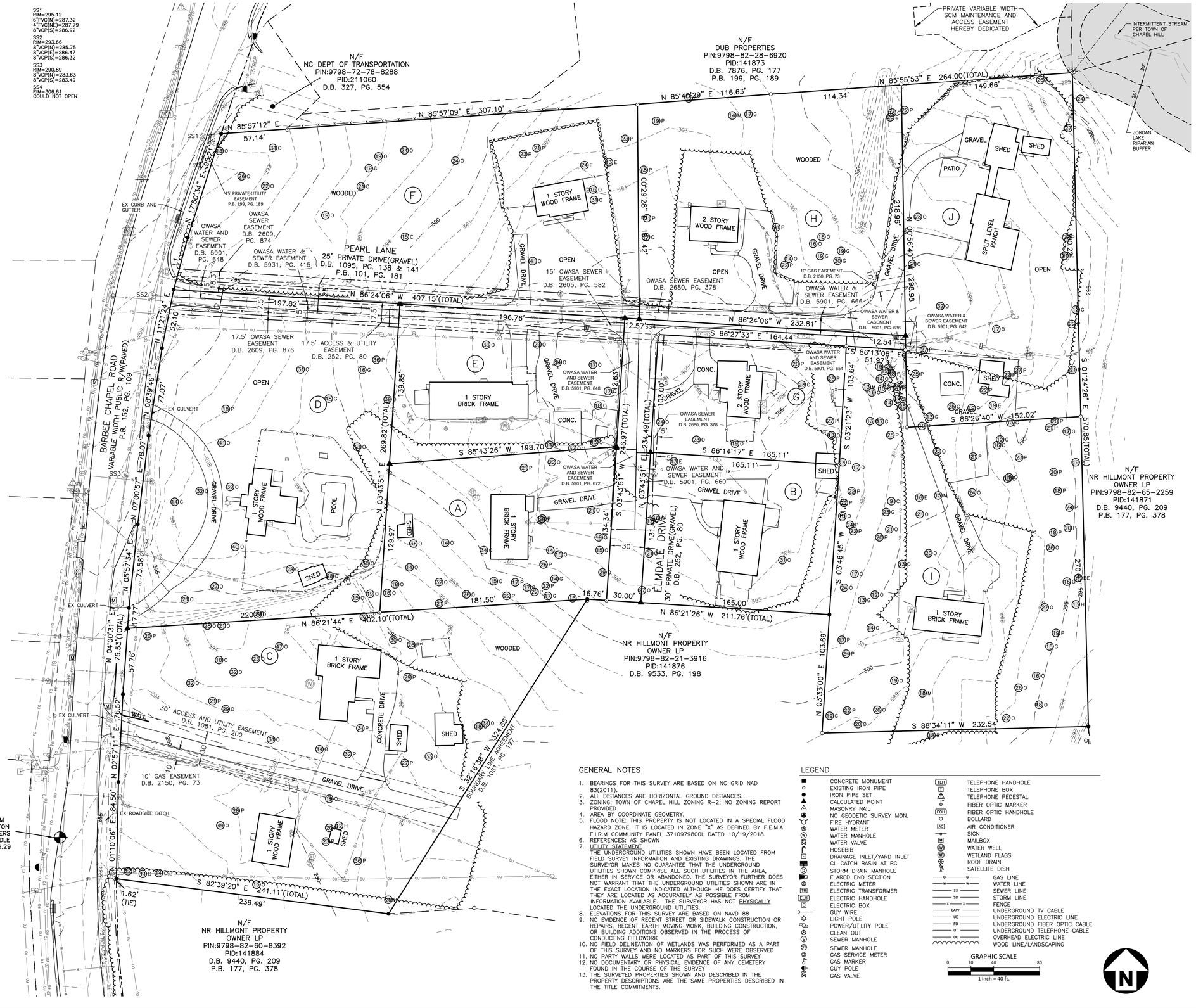
PLAN INFORMATION

PROJECT NO.	TLA-22001
FILENAME	TLA22001-AM1
CHECKED BY	SJC
DRAWN BY	WHM/LIL
SCALE	1" = 180'
DATE	09.29.2022

SHEET

AREA MAP

C0.01



GENERAL NOTES

1. BEARINGS FOR THIS SURVEY ARE BASED ON NC GRID NAD 83(2011).
2. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES.
3. ZONING: TOWN OF CHAPEL HILL ZONING R-2; NO ZONING REPORT PROVIDED
4. AREA BY COORDINATE GEOMETRY.
5. FLOOD NOTE: THIS PROPERTY IS NOT LOCATED IN A SPECIAL FLOOD HAZARD ZONE. IT IS LOCATED IN ZONE "X" AS DEFINED BY F.E.M.A F.I.R.M COMMUNITY PANEL 3710979800L DATED 10/19/2018.
6. REFERENCES: AS SHOWN
7. UTILITY STATEMENT
   THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.
8. ELEVATIONS FOR THIS SURVEY ARE BASED ON NAVD 88
9. NO EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS, RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION, OR BUILDING ADDITIONS OBSERVED IN THE PROCESS OF CONDUCTING FIELDWORK
10. NO FIELD DELINEATION OF WETLANDS WAS PERFORMED AS A PART OF THIS SURVEY AND NO MARKERS FOR SUCH WERE OBSERVED
11. NO PARTY WALLS WERE LOCATED AS PART OF THIS SURVEY
12. NO DOCUMENTARY OR PHYSICAL EVIDENCE OF ANY CEMETERY FOUND IN THE COURSE OF THE SURVEY
13. THE SURVEYED PROPERTIES SHOWN AND DESCRIBED IN THE PROPERTY DESCRIPTIONS ARE THE SAME PROPERTIES DESCRIBED IN THE TITLE COMMITMENTS.

LEGEND

- CONCRETE MONUMENT
- EXISTING IRON PIPE
- IRON PIPE SET
- CALCULATED POINT
- MASONRY NAIL
- NC GEODETIC SURVEY MON.
- FIRE HYDRANT
- WATER METER
- WATER MANHOLE
- WATER VALVE
- HOSEBIB
- DRAINAGE INLET/YARD INLET
- CL CATCH BASIN AT BC
- STORM DRAIN MANHOLE
- FLARED END SECTION
- ELECTRIC METER
- ELECTRIC TRANSFORMER
- ELECTRIC HANDHOLE
- ELECTRIC BOX
- GUY WIRE
- LIGHT POLE
- POWER/UTILITY POLE
- CLEAN OUT
- SEWER MANHOLE
- SEWER MANHOLE
- GAS SERVICE METER
- GAS MARKER
- GUY POLE
- GAS VALVE
- TELEPHONE HANDHOLE
- TELEPHONE BOX
- TELEPHONE PEDESTAL
- FIBER OPTIC MARKER
- FIBER OPTIC HANDHOLE
- BOLLARD
- AIR CONDITIONER
- SIGN
- MAILBOX
- WATER WELL
- WETLAND FLAGS
- ROOF DRAIN
- SATELLITE DISH
- GAS LINE
- WATER LINE
- SEWER LINE
- STORM LINE
- FENCE
- UNDERGROUND TV CABLE
- UNDERGROUND ELECTRIC LINE
- UNDERGROUND FIBER OPTIC CABLE
- UNDERGROUND TELEPHONE CABLE
- OVERHEAD ELECTRIC LINE
- WOOD LINE/LANDSCAPING

GRAPHIC SCALE
0 20 40 80
1 inch = 40 ft.

(A) PARCEL A DON PENDERGRAFT PIN:9798-72-94-8347 PID:141879 2 ELMDALE DR D.B. 1613, PG. 446 25,810 SQ.FT. 0.59 AC.	(G) PARCEL G QUENTIN KRANTZ PIN:9798-82-24-0401 PID:141877 110 PEARL LN D.B. 8911, PG. 653 17,024 SQ.FT. 0.39 AC.
(B) PARCEL B FRANK HERLANT PIN:9798-82-24-0401 PID:141878 6 ELMDALE DR D.B. 8911, PG. 659 21,676 SQ.FT. 0.50 AC.	(H) PARCEL H QUENTIN KRANTZ PIN:9798-82-27-2292 PID:141896 111 PEARL LN D.B. 8911, PG. 656 47,038 SQ.FT. 1.08 AC.
(C) PARCEL C STEPHEN PENDERGRAFT, ET.AL. PIN:9798-72-82-2595 PID:141882 5105 BARBEE CHAPEL RD D.B. 9659, PG. 517 79,258 SQ.FT. 1.82 AC.	(I) PARCEL I DONNA SAYERS PIN:9798-82-34-8161 PID:141895 114 PEARL LN D.B. 2598, PG. 537 62,768 SQ.FT. 1.44 AC.
(D) PARCEL D SANDY PENDERGRAFT, ET.AL. PIN:9798-72-75-8083 PID:141880 5101 BARBEE CHAPEL RD D.B. 7565, PG. 832 P.B. 35, PG. 34 59,827 SQ.FT. 1.37 AC.	(J) PARCEL J RODERICK ROBERSON PIN:9798-82-46-2809 PID:141894 115 PEARL LN D.B. 1483, PG. 403 45,142 SQ.FT. 1.04 AC. AREA IN PEARL LN AND ELMDALE DR THAT IS NOT INCLUDED IN ANY LOT 10,090 SQ.FT. 0.23 AC.
(E) PARCEL E FRANK HERLANT PIN:9798-72-95-9660 PID:141881 102 PEARL LN D.B. 2605, PG. 579 24,839 SQ.FT. 0.57 AC.	
(F) PARCEL F SQUARE WHEEL VENTURES LLC PIN:9798-72-97-2169 PID:141875 105 PEARL LN D.B. 8420, PG. 922 62,368 SQ.FT. 1.43 AC.	

PARCEL A	25,810 SQ.FT./0.59 AC.
PARCEL B	21,676 SQ.FT./0.50 AC.
PARCEL C	79,258 SQ.FT./1.82 AC.
PARCEL D	59,827 SQ.FT./1.37 AC.
PARCEL E	24,839 SQ.FT./0.57 AC.
PARCEL F	62,368 SQ.FT./1.43 AC.
PARCEL G	17,024 SQ.FT./0.39 AC.
PARCEL H	47,038 SQ.FT./1.08 AC.
PARCEL I	62,768 SQ.FT./1.44 AC.
PARCEL J	45,142 SQ.FT./1.04 AC.
REMAINDER AREA	10,090 SQ.FT./0.23 AC.
TOTAL AREA	45,5841 SQ.FT./10.46 AC.

TREE LEGEND

10 E	ELM
12 G	SWEET GUM
9 HW	MISC. HARDWOOD
16 H	HICKORY
15 M	MAPLE
31 O	OAK
18 P	PINE
14 PO	POPLAR
14 SY	SYCAMORE

SEE SHEET C0.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

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PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

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CONDITIONAL ZONING PERMIT
DRAWINGS
5101 BARBEE CHAPEL RD
CHAPEL HILL, NC 27517

REVISIONS

NO.	DATE	
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	02.21.2023	REVISED PER 2ND CZP COMMENTS

PLAN INFORMATION

PROJECT NO.	TLA-22001
FILENAME	TLA22001-XC1
CHECKED BY	SJC
DRAWN BY	WHM/LJL
SCALE	1" = 40'
DATE	09.29.2022

SHEET

EXISTING CONDITIONS

C1.00

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STEEP SLOPE LEGEND

- SLOPES 0% – 10% (10.16 AC) (442,918 SF)
- SLOPES 10% – 15% (0.15 AC) (6,548 SF)
- SLOPES 15% – 25% (0.06 AC) (2,651 SF)
- SLOPES >25% (0.00 AC) (0 SF)
- EXEMPT MANMADE SLOPES >25% (0.09 AC) (3,724 SF)

GENERAL NOTES:

1. THERE WILL BE NO DISTURBANCE OF STEEP SLOPES REQUIRING A MODIFICATION REQUEST ON THIS PROJECT.

GRAPHIC SCALE
0 20 40 80
1 inch = 40 ft.

SEE SHEET C0.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053078 SPENCER CHRISTIANSEN NOT FOR CONSTRUCTION

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PLAN INFORMATION

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FILENAME	TLA22001-SS1
CHECKED BY	SJC
DRAWN BY	WHM
SCALE	1" = 40'
DATE	09.29.2022

SHEET

STEEP SLOPES PLAN

C1.01

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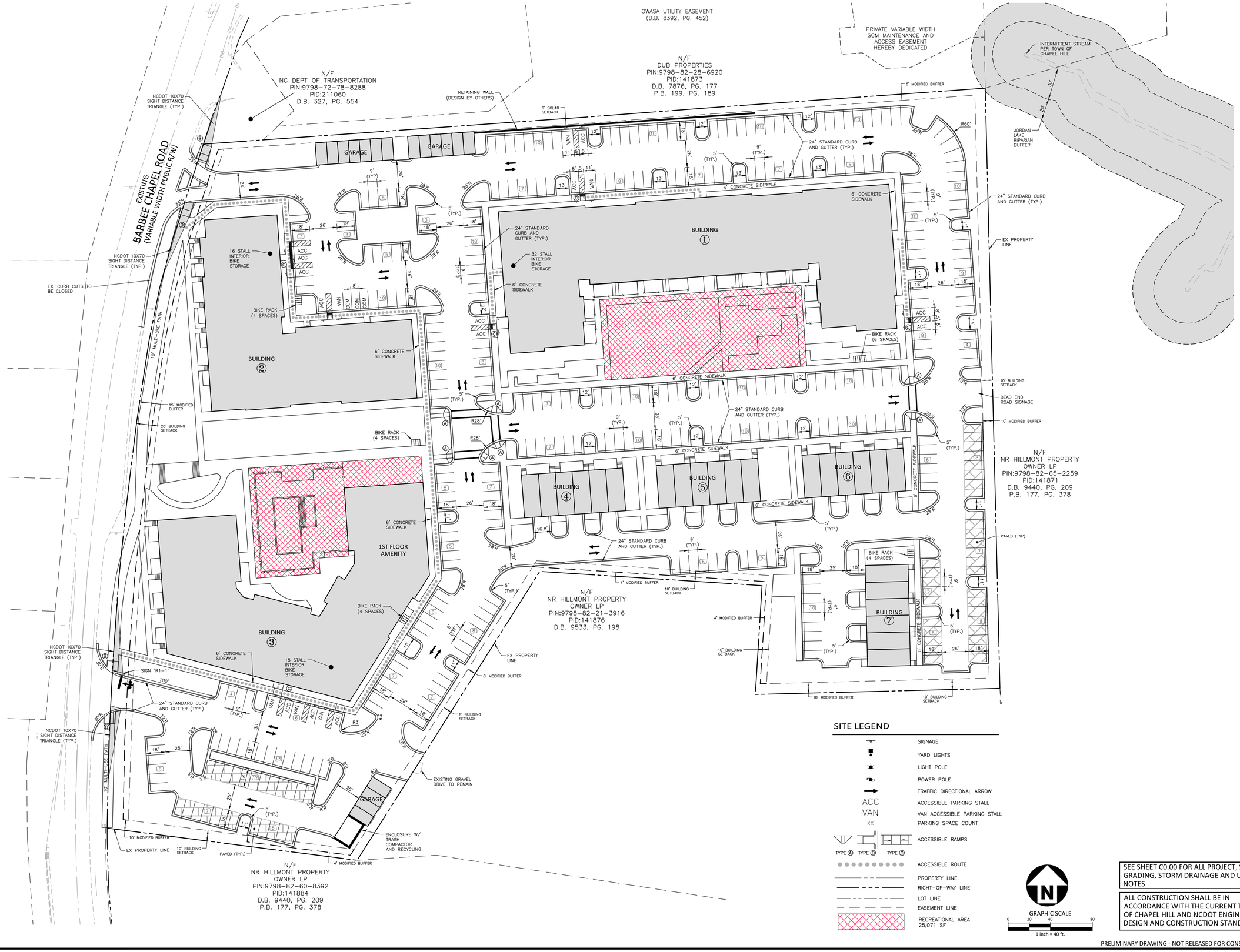

SITE LEGEND

- SIGNAGE
- YARD LIGHTS
- LIGHT POLE
- POWER POLE
- TRAFFIC DIRECTIONAL ARROW
- ACC — ACCESSIBLE PARKING STALL
- VAN — VAN ACCESSIBLE PARKING STALL
- XX — PARKING SPACE COUNT
- TYPE A, TYPE B, TYPE C — ACCESSIBLE RAMPS
- ACCESSIBLE ROUTE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- LOT LINE
- EASEMENT LINE
- RECREATIONAL AREA 25,071 SF

GRAPHIC SCALE
0 20 40 80
1 inch = 40 ft.

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CHECKED BY	SJC
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SCALE	1" = 40'
DATE	09.29.2022

SHEET

SITE PLAN

C2.00

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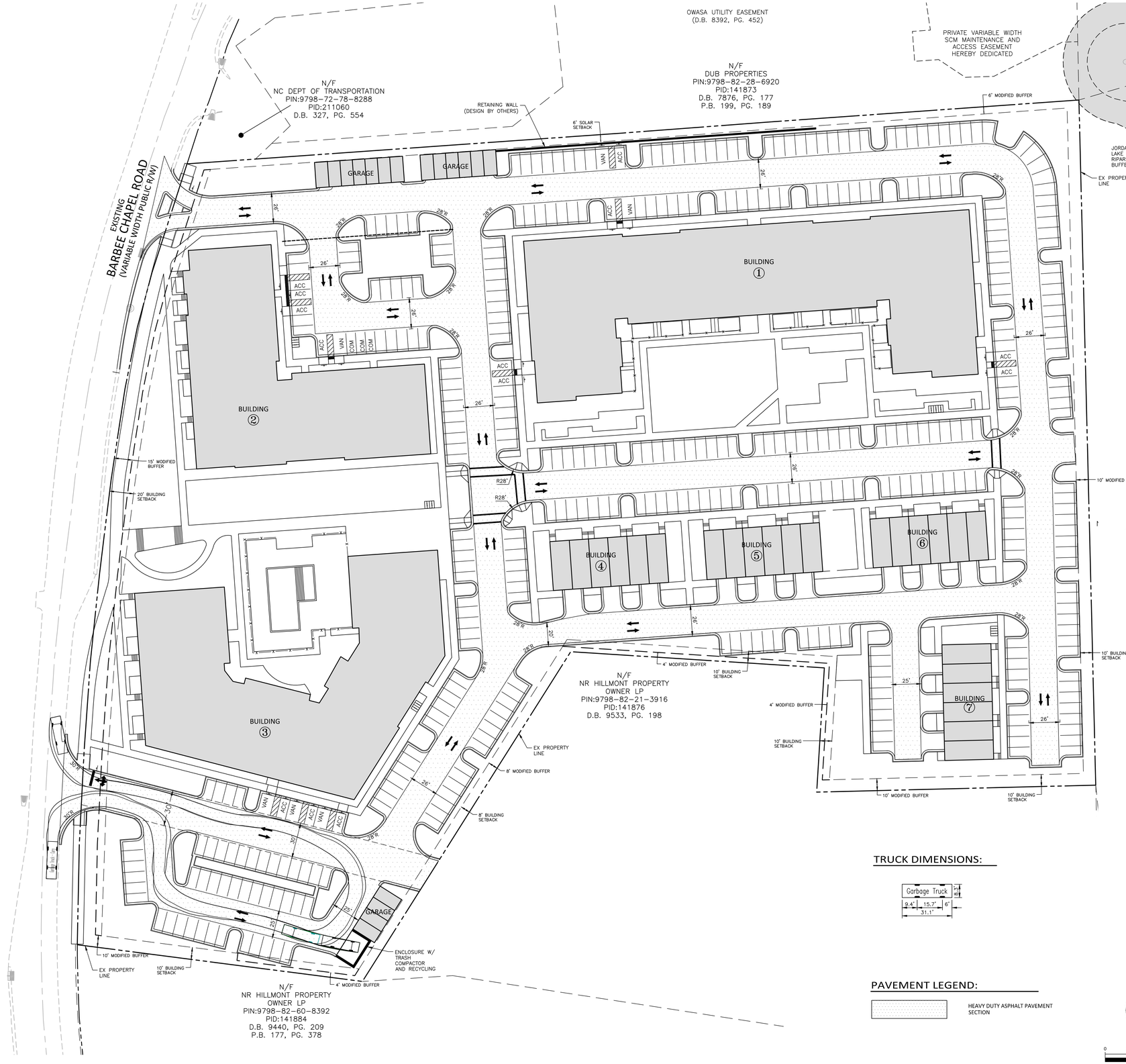

GENERAL SOLID WASTE AND RECYCLING NOTES:

1. ALL EXISTING STRUCTURES 500 SQUARE FEET AND LARGER IN SIZE SHALL BE ASSESSED PRIOR TO DEMOLITION TO ENSURE COMPLIANCE WITH THE COUNTY'S REGULATED RECYCLABLE MATERIALS ORDINANCE (RRMO) AND TO ASSESS THE POTENTIAL FOR DE-CONSTRUCTION AND/OR THE RE-USE OF SALVAGEABLE MATERIALS.
2. BY ORANGE COUNTY ORDINANCE, CLEAN WOOD WASTE, SCRAP METAL, AND CORRUGATED CARDBOARD PRESENT IN CONSTRUCTION OR DEMOLITION WASTE MUST BE RECYCLED.
3. BY ORANGE COUNTY ORDINANCE, ALL HAULERS OF MIXED CONSTRUCTION AND DEMOLITION WASTE THAT INCLUDES ANY REGULATED RECYCLABLE MATERIALS SHALL BE LICENSED BY ORANGE COUNTY.
4. PRIOR TO ANY DEMOLITION OR CONSTRUCTION ACTIVITY ON THE SITE THE APPLICANT SHALL HOLD A PRE-DEMOLITION/PRE-CONSTRUCTION CONFERENCE WITH THE SOLID WASTE STAFF (919-968-2788). THIS MAY BE THE SAME PRE-CONSTRUCTION MEETING HELD WITH OTHER DEVELOPMENT/ENFORCEMENT OFFICIALS.
5. THE PRESENCE OF ANY ASBESTOS CONTAINING MATERIALS ('ACM') AND/OR OTHER HAZARDOUS MATERIALS IN CONSTRUCTION AND DEMOLITION WASTE SHALL BE HANDLED IN ACCORDANCE WITH ANY AND ALL LOCAL, STATE, AND FEDERAL REGULATIONS AND GUIDELINES.
6. IF ANY VEHICLES ARE PARKED IN THE REFUSE OR RECYCLABLES COLLECTION VEHICLE ACCESS AREA, THE CONTAINERS WILL NOT RECEIVE SERVICE UNTIL THE NEXT SCHEDULED COLLECTION DAY.
7. THE OWNER, OR THEIR DESIGNEE, SHALL BE RESPONSIBLE FOR MAINTAINING A FIRE WATCH DURING CONSTRUCTION AND DEMOLITION WHERE MATERIALS SUBJECT TO SPONTANEOUS COMBUSTION OR OTHER HAZARDOUS CONSTRUCTION OR DEMOLITION IS OCCURRING.
8. ALL CONSTRUCTION AND DEMOLITION SHALL BE CONDUCTED IN COMPLIANCE WITH THE CURRENT EDITION OF CHAPTER 14 OF THE NC FPC.
9. ITEMS TO BE RECYCLED WILL INCLUDE ALL MATERIALS ACCEPTED BY ORANGE COUNTY SOLID WASTE (INCLUDED BUT NOT LIMITED TO:)
   - 9.1.1. GLASS (CLEAR, BROWN AND GREEN)
   - 9.1.2. PLASTIC
   - 9.1.3. NEWSPAPERS, MAGAZINES AND OTHER PAPER
   - 9.1.4. METAL CANS
   - 9.1.5. CARDBOARD
10. ADEQUATE SITE LIGHTING SHALL BE PROVIDED IN/AROUND THE SOLID WASTE AND RECYCLING STORAGE AREAS.
11. HEAVY DUTY ASPHALT AND CONCRETE SECTIONS ARE PROVIDED ON SHEET C2.01. THESE SECTIONS APPLY UNLESS OTHERWISE INSTRUCTED BY THE GEOTECHNICAL ENGINEER.

RESIDENTIAL REFUSE COLLECTION NOTES:

1. CERTAIN REFUSE (PAINT, MEDICAL WASTE, ETC.) CANNOT BE COLLECTED FROM STANDARD REFUSE RECEPTACLES. RESIDENTS ARE ADVISED TO CONTACT THE TOWN OF CHAPEL HILL PUBLIC WORKS DEPARTMENT FOR ADDITIONAL INFORMATION ABOUT REFUSE REQUIRING SPECIAL HANDLING AND REFUSE, YARD WASTE, LEAF, AND WHITE GOOD COLLECTION SCHEDULE.
2. REFUSE, RECYCLING, AND YARD WASTE CONTAINERS ALONG WITH LOOSE YARD WASTE PILES MAY NOT BE STORED IN THE PUBLIC STREET RIGHT-OF-WAY BUT BE STORED OUT OF SIGHT FROM THE STREET OR SCREENED.
3. CONTAINERS AND LOOSE PILES SHALL BE BROUGHT TO THE STREET AND PLACED BEHIND THE CURB OR EDGE OF PAVEMENT ON THE COLLECTION DAY AND BE REMOVED BY 7:00 PM ON THE DAY OF COLLECTION.

TRUCK DIMENSIONS:

PAVEMENT LEGEND:

HEAVY DUTY ASPHALT PAVEMENT SECTION

GRAPHIC SCALE
0 20 40 80
1 inch = 40 ft.

SEE SHEET C0.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

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CONDITIONAL ZONING PERMIT
DRAWINGS
5101 BARBEE CHAPEL RD
CHAPEL HILL, NC 27517

NORTH CAROLINA PROFESSIONAL SEAL 053078 ENGINEER SPENCER CHRISTIANSEN
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
	11.23.2022	REVISED PER 1ST CZP COMMENTS
	02.21.2023	REVISED PER 2ND CZP COMMENTS

PLAN INFORMATION

PROJECT NO.	TLA-22001
FILENAME	TLA22001-SW1
CHECKED BY	SJC
DRAWN BY	WHM/LJL
SCALE	1" = 40'
DATE	09.29.2022

SHEET

SOLID WASTE PLAN

C2.01

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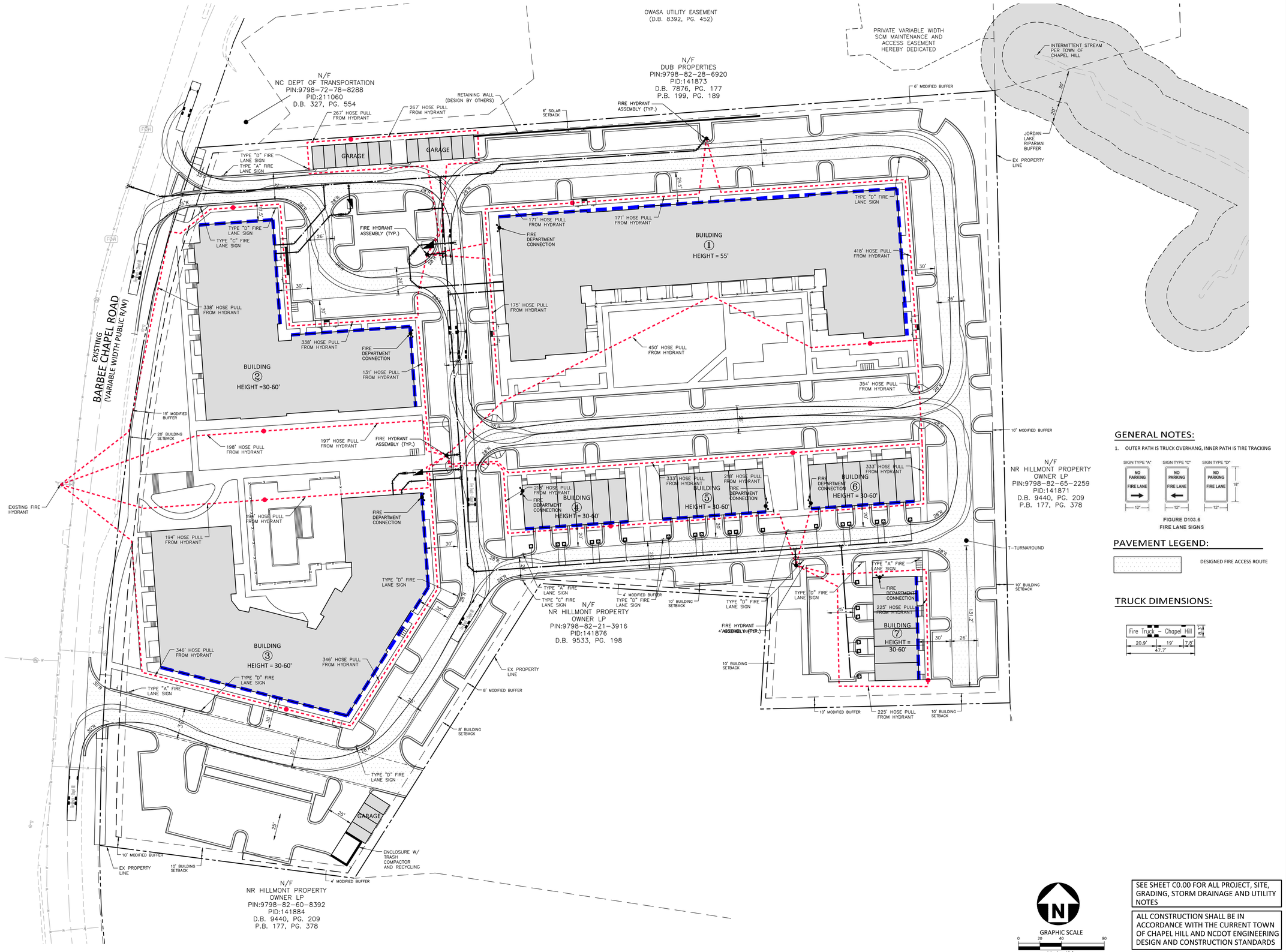

GENERAL NOTES:

1. OUTER PATH IS TRUCK OVERHANG, INNER PATH IS TIRE TRACKING

FIGURE D103.6
FIRE LANE SIGNS

PAVEMENT LEGEND:

DESIGNED FIRE ACCESS ROUTE

TRUCK DIMENSIONS:

GRAPHIC SCALE
0 20 40 80
1 inch = 40 ft.

SEE SHEET C0.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT TOWN OF CHAPEL HILL AND NCDOT ENGINEERING DESIGN AND CONSTRUCTION STANDARDS

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

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FILENAME	TLA22001-FP1
CHECKED BY	SJC
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SCALE	1" = 40'
DATE	09.29.2022

SHEET

FIRE PROTECTION PLAN

C2.02

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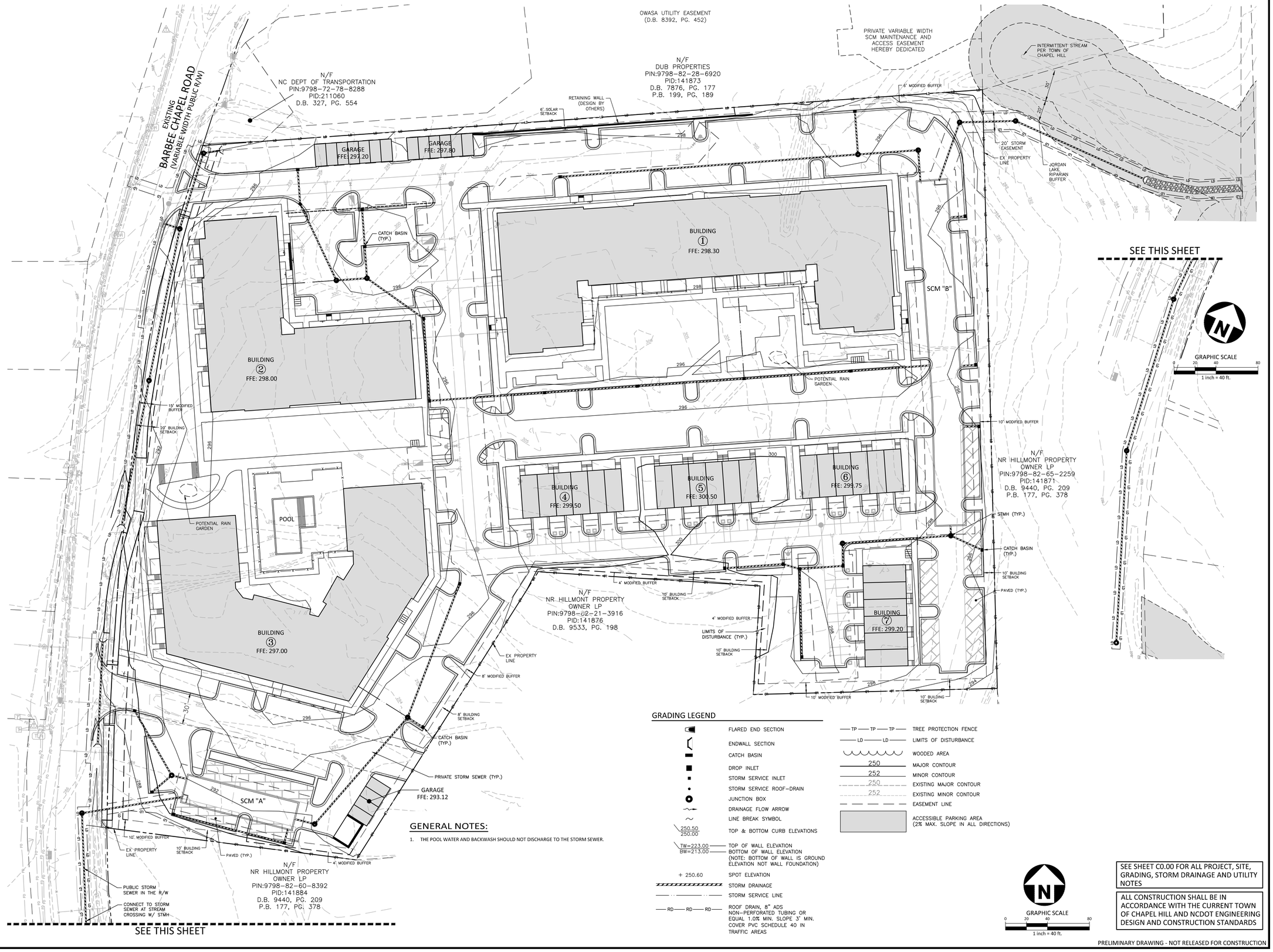

GENERAL NOTES:

1. THE POOL WATER AND BACKWASH SHOULD NOT DISCHARGE TO THE STORM SEWER.

GRADING LEGEND

	FLARED END SECTION
	ENDWALL SECTION
	CATCH BASIN
	DROP INLET
	STORM SERVICE INLET
	STORM SERVICE ROOF-DRAIN
	JUNCTION BOX
	DRAINAGE FLOW ARROW
	LINE BREAK SYMBOL
250.50 / 250.00	TOP & BOTTOM CURB ELEVATIONS
TW=223.00 / BW=213.00	TOP OF WALL ELEVATION / BOTTOM OF WALL ELEVATION (NOTE: BOTTOM OF WALL IS GROUND ELEVATION NOT WALL FOUNDATION)
+ 250.60	SPOT ELEVATION
	STORM DRAINAGE
	STORM SERVICE LINE
RD RD RD	ROOF DRAIN, 8" ADS NON-PERFORATED TUBING OR EQUAL 1.0% MIN. SLOPE 3' MIN. COVER PVC SCHEDULE 40 IN TRAFFIC AREAS
TP TP TP	TREE PROTECTION FENCE
LD LD	LIMITS OF DISTURBANCE
	WOODED AREA
250	MAJOR CONTOUR
252	MINOR CONTOUR
250	EXISTING MAJOR CONTOUR
252	EXISTING MINOR CONTOUR
	EASEMENT LINE
	ACCESSIBLE PARKING AREA (2% MAX. SLOPE IN ALL DIRECTIONS)

GRAPHIC SCALE
0 20 40 80
1 inch = 40 ft.

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CONDITIONAL ZONING PERMIT DRAWINGS
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053078 SPENCER CHRISTIANSEN

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PLAN INFORMATION

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FILENAME	TLA22001-G1
CHECKED BY	SJC
DRAWN BY	WHM
SCALE	1" = 40'
DATE	09.29.2022

SHEET

GRADING PLAN

C3.00

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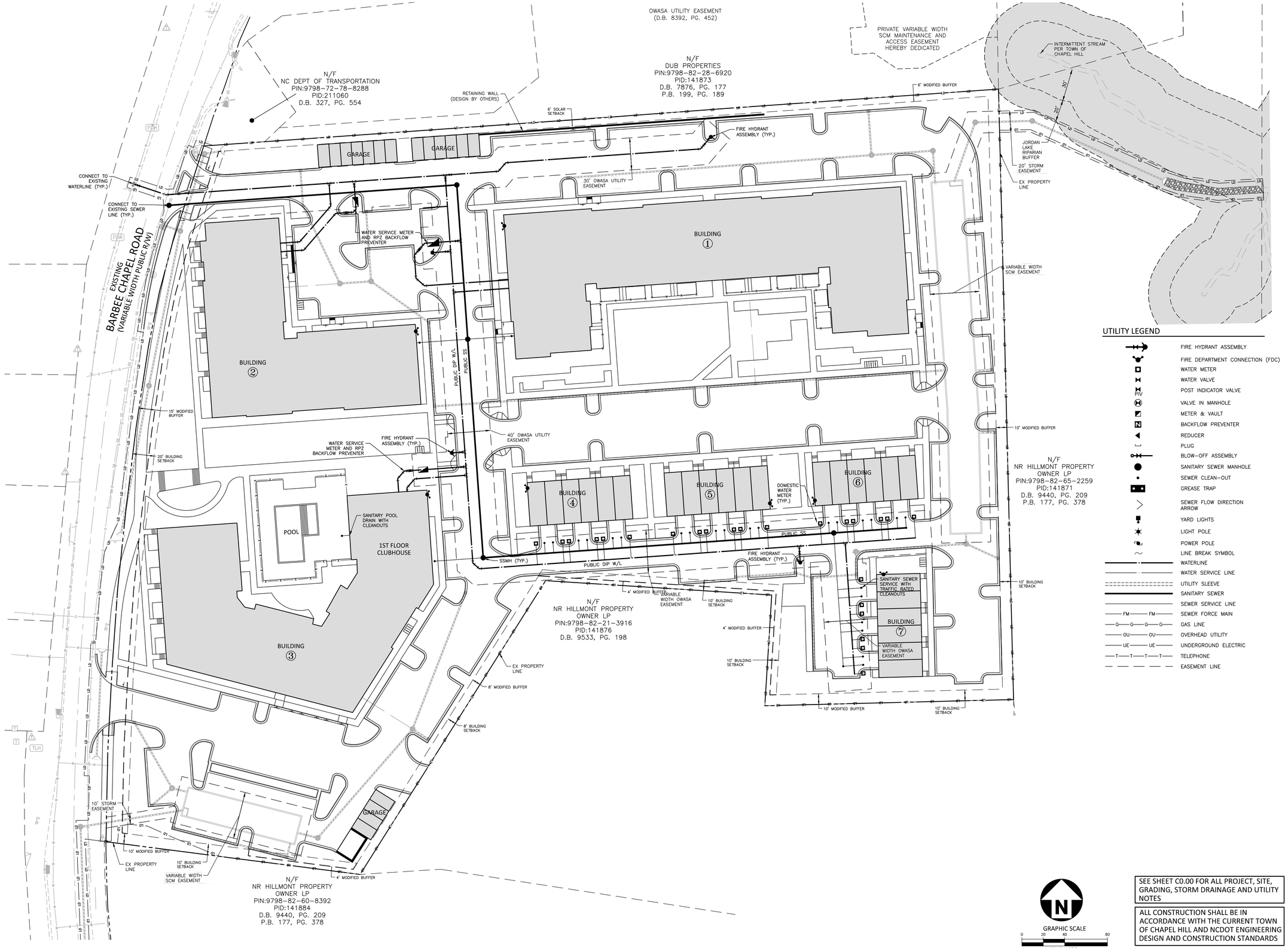

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053078 SEAN JAMES CHRISTIANSEN NOT FOR CONSTRUCTION

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PLAN INFORMATION

PROJECT NO.	TLA-22001
FILENAME	TLA22001-U1
CHECKED BY	SJC
DRAWN BY	WHM/LIL
SCALE	1" = 40'
DATE	09.29.2022

SHEET

UTILITY PLAN

C4.00

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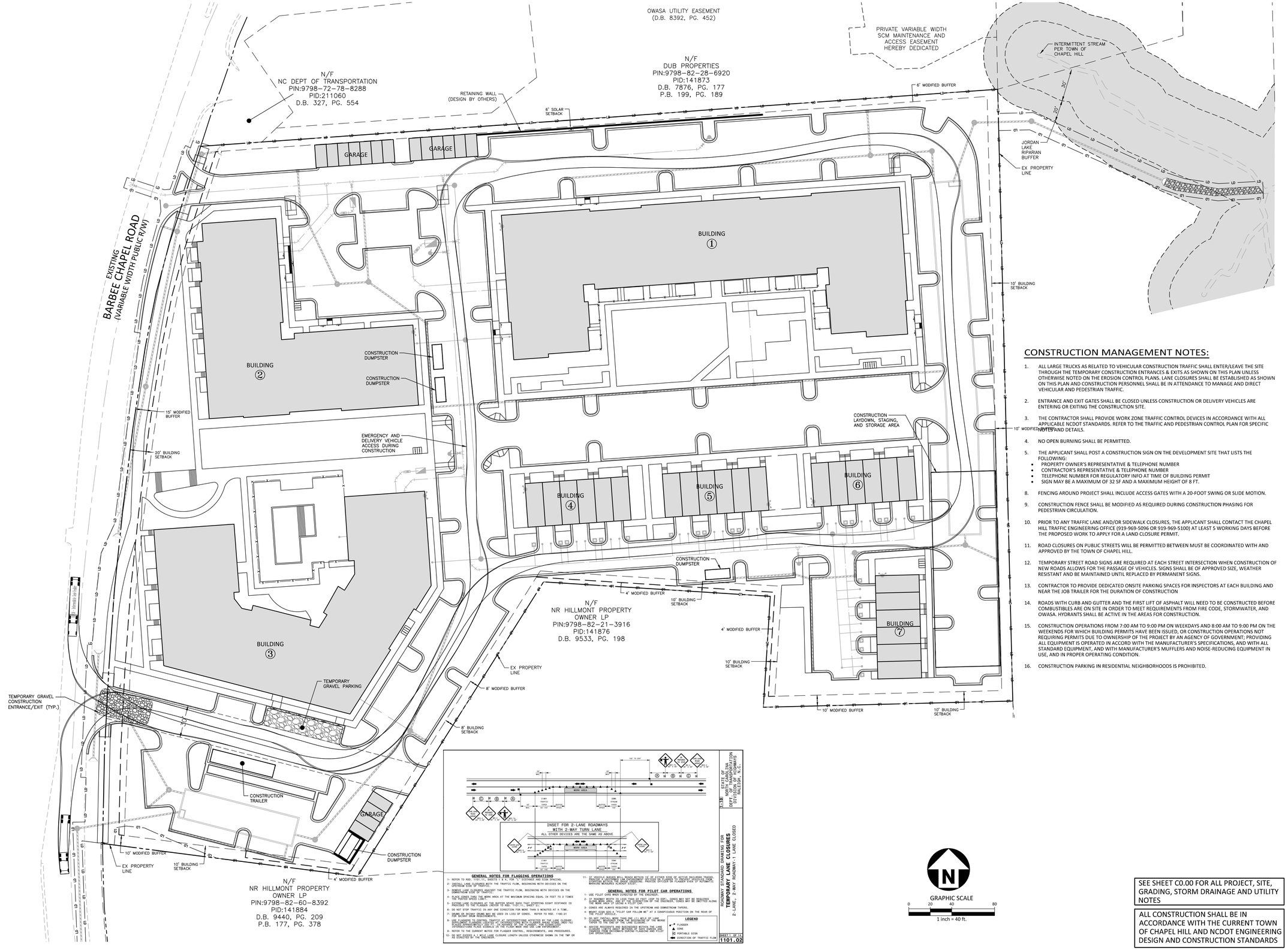

CONSTRUCTION MANAGEMENT NOTES:

1. ALL LARGE TRUCKS AS RELATED TO VEHICULAR CONSTRUCTION TRAFFIC SHALL ENTER/LEAVE THE SITE THROUGH THE TEMPORARY CONSTRUCTION ENTRANCES & EXITS AS SHOWN ON THIS PLAN UNLESS OTHERWISE NOTED ON THE EROSION CONTROL PLANS. LANE CLOSURES SHALL BE ESTABLISHED AS SHOWN ON THIS PLAN AND CONSTRUCTION PERSONNEL SHALL BE IN ATTENDANCE TO MANAGE AND DIRECT VEHICULAR AND PEDESTRIAN TRAFFIC.
2. ENTRANCE AND EXIT GATES SHALL BE CLOSED UNLESS CONSTRUCTION OR DELIVERY VEHICLES ARE ENTERING OR EXITING THE CONSTRUCTION SITE.
3. THE CONTRACTOR SHALL PROVIDE WORK ZONE TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH ALL APPLICABLE NCDOT STANDARDS. REFER TO THE TRAFFIC AND PEDESTRIAN CONTROL PLAN FOR SPECIFIC NOTES AND DETAILS.
4. NO OPEN BURNING SHALL BE PERMITTED.
5. THE APPLICANT SHALL POST A CONSTRUCTION SIGN ON THE DEVELOPMENT SITE THAT LISTS THE FOLLOWING:
   - PROPERTY OWNER'S REPRESENTATIVE & TELEPHONE NUMBER
   - CONTRACTOR'S REPRESENTATIVE & TELEPHONE NUMBER
   - TELEPHONE NUMBER FOR REGULATORY INFO AT TIME OF BUILDING PERMIT
   - SIGN MAY BE A MAXIMUM OF 32 SF AND A MAXIMUM HEIGHT OF 8 FT.
8. FENCING AROUND PROJECT SHALL INCLUDE ACCESS GATES WITH A 20-FOOT SWING OR SLIDE MOTION.
9. CONSTRUCTION FENCE SHALL BE MODIFIED AS REQUIRED DURING CONSTRUCTION PHASING FOR PEDESTRIAN CIRCULATION.
10. PRIOR TO ANY TRAFFIC LANE AND/OR SIDEWALK CLOSURES, THE APPLICANT SHALL CONTACT THE CHAPEL HILL TRAFFIC ENGINEERING OFFICE (919-969-5096 OR 919-969-5100) AT LEAST 5 WORKING DAYS BEFORE THE PROPOSED WORK TO APPLY FOR A LAND CLOSURE PERMIT.
11. ROAD CLOSURES ON PUBLIC STREETS WILL BE PERMITTED BETWEEN MUST BE COORDINATED WITH AND APPROVED BY THE TOWN OF CHAPEL HILL.
12. TEMPORARY STREET ROAD SIGNS ARE REQUIRED AT EACH STREET INTERSECTION WHEN CONSTRUCTION OF NEW ROADS ALLOWS FOR THE PASSAGE OF VEHICLES. SIGNS SHALL BE OF APPROVED SIZE, WEATHER RESISTANT AND BE MAINTAINED UNTIL REPLACED BY PERMANENT SIGNS.
13. CONTRACTOR TO PROVIDE DEDICATED ONSITE PARKING SPACES FOR INSPECTORS AT EACH BUILDING AND NEAR THE JOB TRAILER FOR THE DURATION OF CONSTRUCTION
14. ROADS WITH CURB AND GUTTER AND THE FIRST LIFT OF ASPHALT WILL NEED TO BE CONSTRUCTED BEFORE COMBUSTIBLES ARE ON SITE IN ORDER TO MEET REQUIREMENTS FROM FIRE CODE, STORMWATER, AND OWASA. HYDRANTS SHALL BE ACTIVE IN THE AREAS FOR CONSTRUCTION.
15. CONSTRUCTION OPERATIONS FROM 7:00 AM TO 9:00 PM ON WEEKDAYS AND 8:00 AM TO 9:00 PM ON THE WEEKENDS FOR WHICH BUILDING PERMITS HAVE BEEN ISSUED, OR CONSTRUCTION OPERATIONS NOT REQUIRING PERMITS DUE TO OWNERSHIP OF THE PROJECT BY AN AGENCY OF GOVERNMENT; PROVIDING ALL EQUIPMENT IS OPERATED IN ACCORD WITH THE MANUFACTURER'S SPECIFICATIONS, AND WITH ALL STANDARD EQUIPMENT, AND WITH MANUFACTURER'S MUFFLERS AND NOISE-REDUCING EQUIPMENT IN USE, AND IN PROPER OPERATING CONDITION.
16. CONSTRUCTION PARKING IN RESIDENTIAL NEIGHBORHOODS IS PROHIBITED.

GRAPHIC SCALE
0 20 40 80
1 inch = 40 ft.

SEE SHEET C0.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

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PLAN INFORMATION

PROJECT NO.	TLA-22001
FILENAME	TLA22001-CM1
CHECKED BY	SJC
DRAWN BY	WHM
SCALE	1" = 40'
DATE	09.29.2022

SHEET

CONSTRUCTION MANAGEMENT PLAN

C7.00

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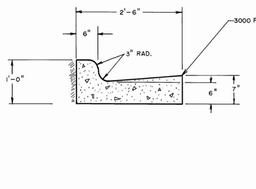
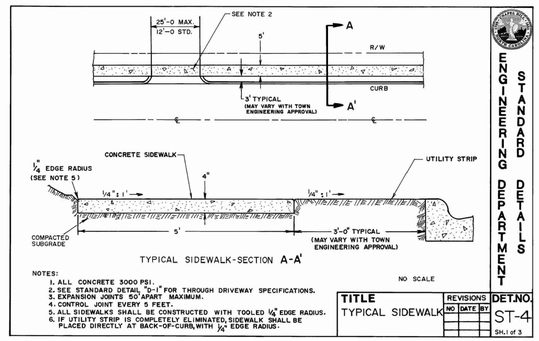


SCALE: 1"=1'-0"

TITLE	REVISIONS NO	DATE	BY	DET.NO.
CURB & GUTTER SECTION				ST-2

ENGINEERING DEPARTMENT STANDARD DETAILS



TYPICAL SIDEWALK-SECTION A-A'

NO SCALE

NOTES:
1. ALL CONCRETE 3000 PSI.
2. SEE STANDARD DETAIL "D-1" FOR THROUGH DRIVEWAY SPECIFICATIONS.
3. EXPANSION JOINTS 60' APART MAXIMUM.
4. CONTROL JOINT EVERY 5 FEET.
5. ALL SIDEWALKS SHALL BE CONSTRUCTED WITH TOOLED 1/4" EDGE RADIUS.
6. IF UTILITY STRIP IS COMPLETELY ELIMINATED, SIDEWALK SHALL BE PLACED DIRECTLY AT BACK-OF-CURB, WITH 1/4" EDGE RADIUS.

TITLE	REVISIONS NO	DATE	BY	DET.NO.
TYPICAL SIDEWALK				ST-4

SH.1 of 3

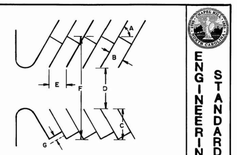
ENGINEERING DEPARTMENT STANDARD DETAILS

A. STANDARD AUTOMOBILES

A	B	C	D	D'	E	F	F'	G
0°	8.0'	N/A	12.0'	20.0'	23.0'	28.0'	36.0'	N/A
45°	8.5'	10.0'	13.0'	20.0'	12.0'	49.0'	56.0'	2.0'
60°	8.5'	19.5'	16.0'	20.0'	9.8'	55.0'	59.0'	2.5'
75°	9.5'	19.8'	20.0'	20.0'	8.8'	59.6'	59.6'	3.0'
90°	9.5'	18.5'	25.0'	25.0'	8.5'	62.0'	62.0'	3.0'

B. COMPACT AUTOMOBILES

A	B	C	D	D'	E	F	F'	G
0°	8.0'	N/A	11.0'	20.0'	19.0'	27.0'	36.0'	N/A
45°	8.0'	15.3'	11.5'	20.0'	11.3'	42.1'	50.6'	1.5'
60°	8.0'	16.3'	13.5'	20.0'	9.2'	45.9	52.6'	1.8'
75°	8.0'	16.5	16.0'	20.0'	8.2'	49.0'	53.0'	2.0'
90°	8.0'	15.5	20.0'	20.0'	8.0'	51.0'	51.0'	2.0'



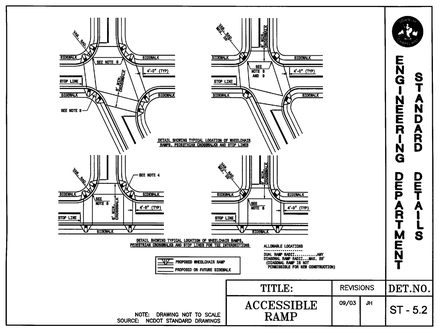
A) PARKING ANGLE
B) STALL WIDTH
C) STALL DEPTH
*(D) AISLE WIDTH BETWEEN STALL LINES (ONE-WAY TRAFFIC)
(E) STALL WIDTH PARALLEL TO AISLE
(F) MODULE WIDTH (ONE-WAY TRAFFIC) WITH PARKING ON BOTH SIDES.
#(G) VECHICLE OVERHANG
*(D') TWO-WAY TRAFFIC
(F') TWO-WAY TRAFFIC

*ADDITIONAL WIDTH MAY BE REQUIRED WHERE THE AISLE SERVES AS A PRINCIPAL VEHICULAR ACCESS TO ON-SITE USES OR STRUCTURES OR SERVES TWO-WAY TRAFFIC.

#PARKING STALLS ABUTTING SIDEWALK AND PLANTING STRIPS SHALL PROVIDE ADDITIONAL CLEARANCE BETWEEN THE STALL AND THE SIDEWALK OR PLANTING STRIP.

TITLE	REVISIONS NO	DATE	BY	DET.NO
LOT LAYOUT SCHEDULE				P-1

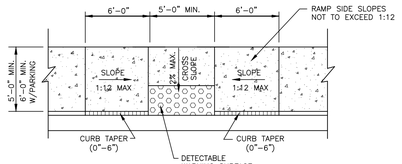
ENGINEERING DEPARTMENT STANDARD DETAILS



NOTE: DRAWING NOT TO SCALE
SOURCE: NCDOT STANDARD DRAWINGS

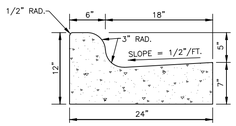
TITLE:	REVISIONS	DET.NO.
ACCESSIBLE RAMP	09/03 JH	ST - 5.2

ENGINEERING DEPARTMENT STANDARD DETAILS

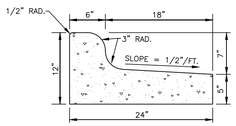


NOTE: RAMP LANDING AREA SHALL RECEIVE A 24" DETECTABLE WARNING SURFACE OF COLOR TO CONTRAST WITH ADJOINING SURFACES PER ICC A117.1-2009 SECT. 705 REQUIREMENTS.

ACCESSIBLE SIDEWALK RAMP
N.T.S.



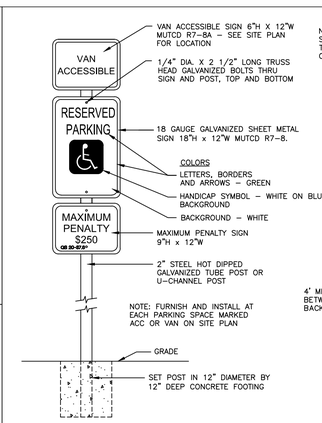
STANDARD 24" CURB AND GUTTER



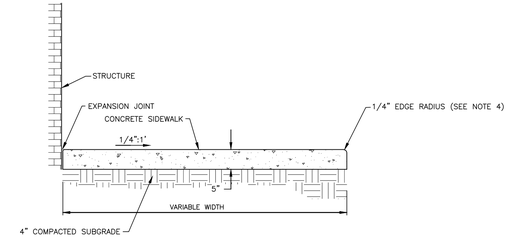
24" SPILL CURB AND GUTTER

NOTES:
1. 10' MAXIMUM BETWEEN DUMMY JOINTS. 15' MAXIMUM BETWEEN DUMMY JOINTS ON MACHINE POURS.
2. 1/2" EXPANSION JOINT EVERY 50'.
3. 3000 PSI CONCRETE MINIMUM, 4" SLUMP MAXIMUM.
4. LIQUID MEMBRANE CURING COMPOUND SHALL MEET THE REQUIREMENTS OF SECTION 1026-2 OF NCDOT STANDARDS AND SPECIFICATIONS FOR ROADS AND STRUCTURES.
5. ALL CONSTRUCTION JOINTS SHALL BE FILLED WITH FILLER AND SEALER IN ACCORDANCE WITH NCDOT ROADWAY STANDARD DETAIL 846.01. THE JOINT MATERIAL SHALL CONFORM TO SECTION 1028-2 OF THE NCDOT STANDARDS AND SPECIFICATIONS FOR ROADS AND STRUCTURES.
6. REFER TO NCDOT DETAIL 846.01 FOR CURB AND GUTTER SUPERELEVATION RATES.

24" CURB AND GUTTER
N.T.S.

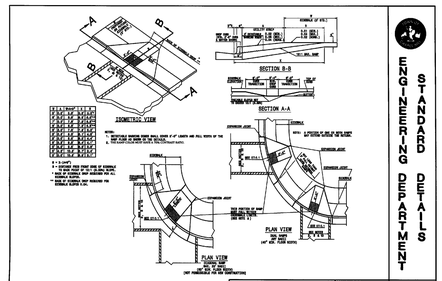


ACCESSIBLE PARKING SPACE SIGN
N.T.S.



NOTES:
1. ALL CONCRETE 4000 PSI.
2. EXPANSION JOINTS 30' APART MAXIMUM.
3. CONTROL JOINT EVERY 5 FEET.
4. ALL SIDEWALKS SHALL BE CONSTRUCTED WITH TOOLED 1/4" EDGE RADIUS.

CONCRETE SIDEWALK
N.T.S.



NOTE: DRAWING NOT TO SCALE
SOURCE: NCDOT STANDARD DRAWINGS

TITLE:	REVISIONS	DET.NO.
ACCESSIBLE RAMP	09/03 JH 02/08 ER	ST - 5.3

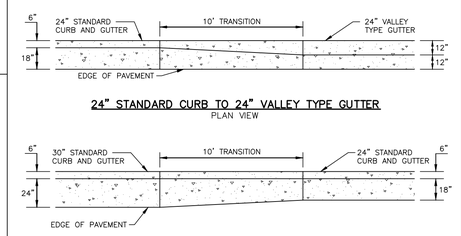
ENGINEERING DEPARTMENT STANDARD DETAILS

NOTES:
1. CONSTRUCT THE WALKING SURFACE WITH SLIP RESISTANCE AND A 70% CONTRASTING COLOR TO THE SIDEWALK.
2. CROSSWALK WIDTHS AND CONFIGURATION MAY VARY BUT MUST CONFORM TO TRAFFIC DESIGN STANDARDS.
3. PROVIDE WHEELCHAIR RAMPS AT LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. LOCATE WHEELCHAIR RAMPS AS DIRECTED BY THE ENGINEER WHERE EXISTING LIGHT POLES, FIRE HYDRANTS, DRAIN INLETS, ETC. AFFECT PLACEMENT. WHERE TWO RAMPS ARE INSTALLED, PLACE NOT LESS THAN TWO FEET OF FULL HEIGHT CURB BETWEEN THE RAMPS. PLACE DUAL RAMPS AS PERPENDICULAR TO THE TRAVEL LANE BEING CROSSED AS POSSIBLE.
4. DO NOT EXCEED 0.08 (12:1) SLOPE ON THE WHEELCHAIR RAMP IN RELATIONSHIP TO THE GRADE OF THE STREET.
5. CONSTRUCT WHEELCHAIR RAMPS 60" (5'-0") OR GREATER FOR DUAL RAMPS AND 60" (5'-0") OR GREATER FOR DIAGONAL RAMPS.
6. USE CONCRETE WITH A SIDEWALK FINISH IN ORDER TO OBTAIN A ROUGH NON-SKID TYPE SURFACE.
7. PLACE A 1/2" EXPANSION JOINT WHERE THE CONCRETE WHEELCHAIR RAMP JOINS THE CURB AS SHOWN ON DETAIL ST-5A.
8. PLACE THE INSIDE PEDESTRIAN CROSSWALK LINES NO CLOSER IN THE INTERSECTION BY BISECTING THE INTERSECTION RADII, WITH ALLOWANCE OF A 4' CLEAR ZONE IN THE VEHICULAR TRAVELWAY WHEN ONE RAMP IS INSTALLED. (SEE NOTE 13)
9. COORDINATE THE CURB CUT AND THE PEDESTRIAN CROSSWALK LINES TO THE FLOOR OF THE WHEELCHAIR RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES. PLACE DIAGONAL RAMPS WITH FLARED SIDES SO 24" OF FULL HEIGHT CURB FALLS WITHIN THE CROSSWALK MARKINGS ON EACH SIDE OF THE FLARES.
10. CONSTRUCT THE PEDESTRIAN CROSSWALK A MINIMUM OF 6 FEET. A CROSSWALK WIDTH OF 8 FEET OR GREATER IS DESIRABLE.
11. USE STOP LINES, NORMALLY PERPENDICULAR TO THE LANE LINES, WHERE IT IS IMPORTANT TO INDICATE THE POINT BEHIND WHICH VEHICLES ARE REQUIRED TO STOP IN COMPLIANCE WITH A STOP SIGN, TRAFFIC SIGNAL OR OTHER LEGAL REQUIREMENT. IN AN UNUSUAL APPROACH SKEW MAY REQUIRE THE PLACEMENT OF THE STOP LINE TO BE PARALLEL TO THE INTERSECTION ROADWAY.
12. TERMINATE PARKING A MINIMUM OF 20 FEET BACK OF PEDESTRIAN CROSSWALK.
13. PLACE ALL PAVEMENT MARKINGS IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION AND THE NORTH CAROLINA SUPPLEMENT TO THE MUTCD.

TITLE:	REVISIONS	DET.NO.
ACCESSIBLE RAMP	09/03 JH	ST - 5.4

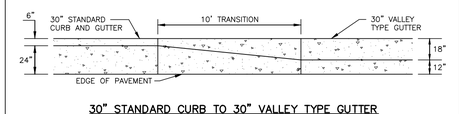
SOURCE: NCDOT STANDARD DRAWINGS

ENGINEERING DEPARTMENT STANDARD DETAILS



24" STANDARD CURB TO 24" VALLEY TYPE GUTTER
PLAN VIEW

30" STANDARD CURB TO 24" STANDARD CURB
PLAN VIEW



30" STANDARD CURB TO 30" VALLEY TYPE GUTTER
PLAN VIEW

NOTES:
1. TRANSITIONS NOT TO BE LOCATED IN A CURB RADIUS.
2. SEE TYPICAL CURB DETAILS FOR SPECIFIC DIMENSIONS AND INFORMATION.
3. DUMMY JOINTS SHALL BE USED AT TRANSITION POINTS OR EXPANSION JOINTS IF MADE WITH SEPARATE POURS.
4. ROLL CURB MAY BE SUBSTITUTED FOR VALLEY TYPE GUTTER, BASED ON SITE REQUIREMENTS.

CURB TRANSITION DETAILS
N.T.S.

SEE SHEET C0.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT TOWN OF CHAPEL HILL AND NCDOT ENGINEERING DESIGN AND CONSTRUCTION STANDARDS

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

MCADAMS
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CONDITIONAL ZONING PERMIT
DRAWINGS
5101 BARBEE CHAPEL RD
CHAPEL HILL, NC 27517

NORTH CAROLINA PROFESSIONAL SEAL 053078 ENGINEER SKINNER CHRISTIANSEN — NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
	11.23.2022	REVISED PER 1ST CZP COMMENTS
	02.21.2023	REVISED PER 2ND CZP COMMENTS

PLAN INFORMATION

PROJECT NO.	TLA-22001
FILENAME	TLA22001-D1
CHECKED BY	SJC
DRAWN BY	WHM/LJL
SCALE	NTS
DATE	09.29.2022

SHEET

SITE DETAILS

C8.00

STORMWATER CONTROL MEASURE 'A' CONSTRUCTION SPECIFICATIONS

GENERAL NOTES

1. PRIOR TO CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS AND NOTES SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION.
2. PRIOR TO ANY CONSTRUCTION OR PLACEMENT OF ANY BACKFILL, THE ONSITE GEOTECHNICAL ENGINEER SHALL INSPECT THE EXCAVATION AREA FOR THE UNDERGROUND SCM WITHIN THIS AREA TO ASSESS WHETHER SUITABLE SOILS EXIST AT THE SUBGRADE LEVEL. IF THE CONTRACTOR CONSTRUCTS AND COVERS UP THE UNDERGROUND SCM PRIOR TO INSPECTION, THEN THIS AREA SHALL BE UNCOVERED AND TESTED (TO THE ENGINEER'S AND OWNER'S APPROVAL) AT THE CONTRACTOR'S EXPENSE.
3. THE FACILITY SHALL NOT BE USED AS A TEMPORARY EROSION CONTROL DEVICE (I.E. SEDIMENT TRAP OR SEDIMENT BASIN) DURING CONSTRUCTION.
4. PRIOR TO PLACING STORMFILTER CARTRIDGES WITHIN THE UNDERGROUND SYSTEM , THE CONTRACTOR SHALL REQUEST AN ONSITE MEETING WITH THE DESIGN ENGINEER AND THE EROSION CONTROL INSPECTOR TO ENSURE THE UPSTREAM DRAINAGE AREA IS COMPLETELY STABILIZED (I.E. GOOD VEGETATIVE COVER). IF THE CONTRACTOR DECIDES TO PLACE THE STORMFILTER CARTRIDGES PRIOR TO APPROVAL FROM THE DESIGN ENGINEER AND THE EROSION CONTROL INSPECTOR, THEN THE CONTRACTOR SHALL EXCAVATE/REPLACE, AS NECESSARY, THE COMPONENTS NEEDED FOR THE SYSTEM TO FUNCTION PROPERLY AT HIS / HER EXPENSE SHOULD THE STORMFILTER CARTRIDGES NOT FUNCTION PROPERLY (I.E. WILL NOT DRAIN DUE TO SEDIMENT DEPOSITION) DUE TO AN UNSTABILIZED UPSTREAM DRAINAGE AREA.
5. ONCE CONSTRUCTED, THE STORMFILTER CARTRIDGES SHALL NOT RECEIVE STORMWATER RUNOFF UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA TO THE UNDERGROUND SYSTEM HAS BEEN COMPLETELY STABILIZED AND SITE CONSTRUCTION IS COMPLETE.
6. ALL COMPONENTS OF THE UNDERGROUND SCM SYSTEM (STORMFILTER MANHOLE, CONCRETE VAULT, JOINT / RISER CONNECTIONS, ENDCAPS, ACCESS MANHOLES, ETC.) SHALL BE DESIGNED BY OTHERS. ANY VARIATIONS OR CHANGES MADE FROM THESE SPECIFICATIONS AND DRAWINGS DURING THE ORDERING AND/ OR INSTALLATION OF ALL COMPONENTS MUST BE APPROVED BY THE DESIGN ENGINEER. THE STRUCTURAL DESIGN OF THE UNDERGROUND SCM, ALONG WITH ITS ASSUMPTIONS, IS ALSO BY OTHERS. THE JOHN R. McADAMS COMPANY, INC. AND ITS EMPLOYEES ASSUME NO LIABILITY WITH RESPECT TO ANY ASPECT OF THE STRUCTURAL DESIGN FOR THE UNDERGROUND SCM SYSTEM.
7. ALL PIPE / RISER CONNECTIONS AND JOINTS ASSOCIATED WITH THE UNDERGROUND SCM SYSTEM SHALL BE WATER TIGHT. THE MECHANISM FOR ACHIEVING THIS SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR REVIEW.
8. THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE UNDERGROUND SCM SYSTEM SITE. IT IS ANTICIPATED THAT PUMPING WILL BE NECESSARY IN THE EXCAVATION AREAS. DURING PLACEMENT OF FILL WITHIN THIS AREA (OR OTHER AREAS AS NECESSARY), THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION. THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDE SLOPES ARE STABLE.
9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADHERE TO ALL CURRENT OSHA REGULATIONS FOR CONFINED SPACE ENTRY AND PROVIDE SUCH DURING ENGINEER WALK-THROUGH/INSPECTION.
10. ALL PIPE PENETRATIONS THROUGH A CONCRETE STRUCTURE (I.E. STORMFILTER CARTRIDGE / DETENTION SYSTEM, STORM DRAINAGE MANHOLES, ETC.) SHALL BE MADE WATERTIGHT USING NON-SHRINK CEMENTIOUS GROUT.
11. EXISTING UTILITIES AND STRUCTURES SHOWN, BOTH UNDERGROUND AND ABOVE GROUND, ARE BASED ON A FIELD SURVEY AND THE BEST AVAILABLE RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS PRIOR TO BEGINNING RELATED CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

STORMWATER MANAGEMENT SYSTEM MATERIAL SPECIFICATIONS

1. THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM IS TO BE DESIGNED BY OTHERS. ANY CHANGES TO THE PLANS SHALL BE PROVIDED TO THE DESIGN ENGINEER FOR REVIEW. PRIOR TO INSTALLATION, SHOP DRAWINGS OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE PROVIDED TO THE DESIGN ENGINEER AND TO THE TOWN OF CHAPEL HILL FOR REVIEW.
2. FILTER CARTRIDGES SHALL BE CONTECH STORMFILTERS WITH PHOSPHOSORB MEDIA. INSTALLATION OF THE STORMWATER DEVICE SHALL BE PER THE MANUFACTURER'S INSTALLATION GUIDELINES AND SPECIFICATIONS.
3. ACCESS RISERS SHALL BE INSTALLED PER STRUCTURAL SPECIFICATIONS. ACCESS STEPS / LADDERS SHALL BE ATTACHED TO THE RISERS TO ALLOW FOR ACCESS INTO THE STORMWATER MANAGEMENT SYSTEM.
4. THE 24"Ø DIP OUTLET BARREL OF THE DETENTION SYSTEM SHALL BE CLASS 350 DIP, MEETING THE REQUIREMENTS OF ASTM A716. THE PIPE JOINTS SHALL BE LOCKING JOINTS PER ANSI/AWWA C110/A21.10 OR ANSI/AWWA C153/A21.53 STANDARDS.
5. THE CONTRACTOR SHALL INSTALL THE STORMFILTER SYSTEM PER MANUFACTURERS' SPECIFICATIONS. CONTRACTOR TO PROVIDE A LETTER FROM MATERIAL SUPPLIER(S) STATING MATERIALS MEET THE SPECIFIED STANDARDS PRIOR TO INSTALLATION.
6. COVER AND REVIEW OF SITE CONDITIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE SYSTEM TO BE THE RESPONSIBILITY OF THE MANUFACTURER.

STATEMENT OF RESPONSIBILITY

1. ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THIS FACILITY SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.

FOUNDATION NOTES

1. ONCE THE EXCAVATION IS COMPLETE AND PRIOR TO INSTALLATION OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM, THE ONSITE GEOTECHNICAL ENGINEER SHALL VERIFY THE BEARING CAPACITY OF THE UNDERLYING SOILS TO SERVE AS A FOUNDATION FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM. IF THE ONSITE GEOTECHNICAL ENGINEER DEEMS THE FOUNDATION SOILS AS UNSUITABLE, THEN THE UNSUITABLE MATERIAL SHOULD BE REMOVED DOWN TO A SUITABLE DEPTH AND THEN BUILT BACK UP TO THE CORRECT ELEVATION WITH A COMPACTED BACKFILL MATERIAL THAT IS APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER. THE APPROVED BACKFILL MATERIAL SHOULD HAVE A GRADATION THAT WILL NOT ALLOW THE MIGRATION OF FINES, WHICH COULD CAUSE SETTLEMENT OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM. IF NECESSARY, A GEOTEXTILE FABRIC CAN BE USED TO SEPARATE THE UNDERLYING SOILS AND THE BACKFILL MATERIAL. THIS GEOTEXTILE FABRIC (IF USED) IS TO BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER.
2. PLEASE NOTE THAT IF THE CONTRACTOR CONSTRUCTS AND COVERS UP THE EXCAVATION FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM PRIOR TO INSPECTION, THEN THIS AREA SHALL BE UNCOVERED AND TESTED (TO THE ENGINEER'S AND OWNER'S APPROVAL) AT THE CONTRACTOR'S EXPENSE.
3. THE FOUNDATION SUBGRADE SHALL BE GRADED TO A UNIFORM OR SLIGHTLY SLOPING GRADE PRIOR TO PLACEMENT OF THE BEDDING MATERIAL. IF THE FOUNDATION SUBGRADE WILL BE EXPOSED FOR AN EXTENDED PERIOD OF TIME DURING CONSTRUCTION, THEN IT SHOULD BE GRADED TO A SLIGHT SLOPE SUCH THAT SATURATION OF THE SUBGRADE DOES NOT OCCUR.
4. THE BEDDING MATERIAL FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM SHALL BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER. TYPICALLY, A WELL-GRADED GRANULAR MATERIAL WILL BE USED FOR THE BEDDING. PLEASE NOTE THAT IF CONSTRUCTION EQUIPMENT WILL BE OPERATING FOR AN EXTENDED PERIOD OF TIME ON THE BEDDING, THEN THE APPROPRIATE MEASURES (E.G. ENGINEERED FABRIC, STIFF GEOGRID, ETC.) SHALL BE TAKEN TO ENSURE THE INTEGRITY OF THE BEDDING IS NOT COMPROMISED.
5. THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM THE EXCAVATION. IT IS BEST TO BEGIN THE CONSTRUCTION OF THE DETENTION SYSTEMS AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR WATER TO ESCAPE.
6. THE CONTRACTOR SHALL PROVIDE A FOUNDATION DRAIN FOR THE UNDERGROUND DETENTION SYSTEM DESIGNED BY OTHERS. THE UNDERDRAIN SYSTEM SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATION AND SHALL POSITIVELY DRAIN TO DOWNSTREAM STRUCTURE. THE ONSITE GEOTECHNICAL ENGINEER SHALL DETERMINE IF FOUNDATION DRAINS ARE NOT REQUIRED FOR THE UNDERGROUND SCM SYSTEM. THE DESIGN ENGINEER SHALL BE NOTIFIED FOLLOWING THIS DETERMINATION.

BEDDING NOTES

1. THE EXCAVATION SUB GRADE MUST BE TRANSIT LEVEL.
2. THE EXCAVATION PIT SHALL BE LINED (ON THE BOTTOM AND ALL FOUR SIDES) WITH A NON-WOVEN GEO-TEXTILE (GEOTEX 401 OR APPROVED EQUIVALENT). THE ONSITE GEOTECHNICAL ENGINEER SHALL APPROVE FABRIC FOR USE.
3. THE SUBGRADE FOR THE DETENTION SYSTEM CAN BE A CONCRETE SLAB, OR CLEAN GRANULAR MATERIAL WITH A MAXIMUM AGGREGATE SIZE OF 3/4". THE BEDDING SHALL BE FREE FROM ROCK FORMATIONS, PROTRUDING STONES, FROZEN LUMPS, ROOTS, AND OTHER FOREIGN MATERIAL.
4. PREPARE THE SUBGRADE PER THE ONSITE GEOTECHNICAL ENGINEER'S DIRECTION (APPROXIMATELY 5-6" BELOW GRADE ON WHICH SLAB WILL SET). THE BEDDING MATERIAL SHOULD BE GRADED SUCH THAT A SMOOTH UNIFORM GRADE IS ESTABLISHED TO ALLOW FOR OPTIMUM PLACEMENT OF THE SAND FILTER.
5. THE SUBGRADE MUST SUPPORT THE DETENTION SYSTEM WITHOUT DIFFERENTIAL SETTLEMENT BETWEEN PIECES.
6. IF CONSTRUCTION EQUIPMENT WILL BE OPERATING FOR AN EXTENDED PERIOD OF TIME ON THE BEDDING, THEN THE APPROPRIATE MEASURES (E.G. STIFF GEOGRID, ETC.) SHALL BE TAKEN TO ENSURE THE INTEGRITY OF THE BEDDING IS NOT COMPROMISED.

BACKFILL MATERIAL NOTES

1. THE ON-SITE GEOTECHNICAL ENGINEER SHALL SPECIFY THE BACKFILL MATERIAL FOR THE STORMWATER MANAGEMENT SYSTEM.
2. THE BACKFILL MATERIAL SHOULD BE FREE OF ROCKS, FROZEN LUMPS, AND OTHER FOREIGN MATTER THAT COULD CAUSE HARD SPOTS WITHIN THE BACKFILL MATERIAL, OR THAT COULD DECOMPOSE AND CREATE VOIDS.
3. HIGHLY PLASTIC SILTS, HIGHLY PLASTIC CLAYS, ORGANIC SILTS, ORGANIC CLAYS, AND PEATS SHOULD NOT BE USED AS A BACKFILL MATERIAL.
4. THE BACKFILL MATERIAL SHOULD BE PLACED IN 6" LOOSE LIFTS AND COMPACTED TO 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM-D698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN +/- TWO PERCENT OF ITS OPTIMUM MOISTURE CONTENT.
5. ANY MATERIAL STOCKPILING ON TOP OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE APPROVED BY THE STRUCTURAL DESIGN ENGINEER OR DETENTION SYSTEM MANUFACTURER.

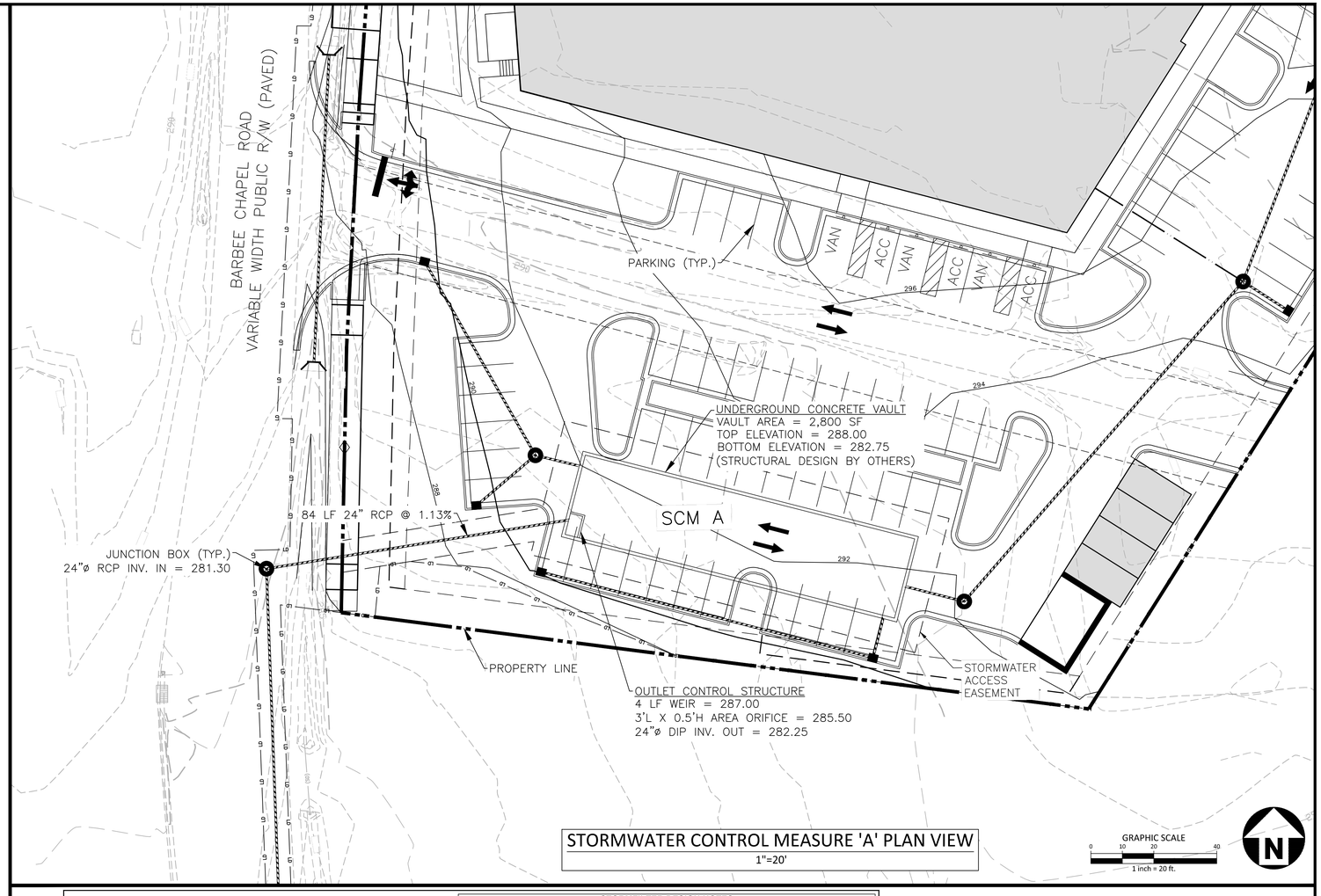
UNDERGROUND VAULT CONSTRUCTION NOTES

1. UNDERGROUND VAULT CONFIGURATION IS TO BE DESIGNED AND PROVIDED BY OTHERS.
2. ABSOLUTELY NO RUNOFF SHALL ENTER THE UNDERGROUND VAULT UNTIL ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED.
3. MANHOLE ACCESS SHALL BE PROVIDED FOR THE UNDERGROUND VAULT. MANHOLES SHALL BE IN COMPLIANCE WITH TOWN OF CHAPEL HILL STANDARD DETAILS BUT SHALL BE A MINIMUM OF 24 INCHES IN DIAMETER TO COMPLY WITH OSHA CONFINED SPACE REQUIREMENTS (OR MINIMUM OSHA REQUIREMENTS APPLICABLE AT TIME OF CONSTRUCTION). CONTRACTOR SHALL PROVIDE ACCESS LADDERS FOR ACCESS BELOW ALL MANHOLES. MANHOLE COVERS SHALL ALLOW FOR PROPER VENTILATION.

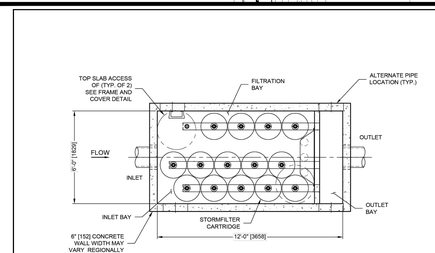
SYSTEM TESTING NOTES

1. PRIOR TO PLACEMENT OF THE BACKFILL MATERIAL AND STORM FILTER CARTRIDGES, CONTRACTOR SHALL TEST FOR WATER TIGHTNESS. ENTRANCES AND EXITS SHALL BE PLUGGED AND THE SYSTEM COMPLETELY FILLED WITH WATER TO DEMONSTRATE WATER TIGHTNESS. WATER TIGHTNESS MEANS NO SIGNIFICANT FOR A PERIOD OF 24 HOURS. SIGNIFICANT LEAKAGE TO BE DETERMINED BY THE CERTIFYING ENGINEER. CONTRACTOR SHALL CALL AND SCHEDULE THE FIELD TESTING OF THE SYSTEM (WATER-TIGHTNESS) WITH THE ENGINEER AT LEAST 2 WORKING DAYS PRIOR TO THE TEST. THE CONTRACTOR SHALL PROVIDE WRITTEN REPORTS TO THE ENGINEER VERIFYING THE WATER TIGHTNESS OF THE STORMWATER VAULT.

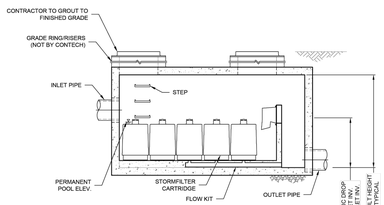
M:\Projects\TLA\TLA22001\04-Production\Water Resources\CP\Current Drawing\Construction Drawing\TLA22001-SCMA.dwg, 2/21/2023 10:38:21 AM, Maria Torres



STORMWATER CONTROL MEASURE 'A' PLAN VIEW
1"=20'



PLAN VIEW
VAULT STYLE: INLET BAY - OUTLET BAY



SECTION A-A

The Stormwater Management StormFilter®
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,322,630; 5,324,070; 5,849,191; 6,027,639; 6,406,946; RELATED FOREIGN PATENTS; OR OTHER PATENTS PENDING.

STORMFILTER DESIGN NOTES

- STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA SPECIFIC FLOW RATE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD.
- A 6' x 12' [1829 mm x 3658 mm] STANDARD VAULT STYLE STORMFILTER IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (14) AND IS AVAILABLE IN A RIGHT INLET (AS SHOWN) OR A LEFT INLET CONFIGURATION. OTHER CONFIGURATIONS ARE AVAILABLE.
- ALL PARTS AND INTERNAL ASSEMBLY PROVIDED BY CONTECH UNLESS OTHERWISE NOTED.

CARTRIDGE SIZE (in. [mm])	27 [686]			18 [457]			LOW DROP		
RECOMMENDED MINIMUM HYDRAULIC DROP (H, ft. [mm])	3.05 [930]			2.3 [701]			1.8 [549]		
SPECIFIC FLOW RATE (gpm/sf [L/s/m²])	2 [1.36]	1.67* [1.13]*	1 [0.65]	2 [1.36]	1.67* [1.13]*	1 [0.68]	2 [1.36]	1.67* [1.13]*	1 [0.68]
CARTRIDGE FLOW RATE (gpm [L/s])	22.5 [1.42]	18.79 [1.19]	11.25 [0.71]	15 [0.95]	12.53 [0.79]	7.5 [0.47]	10 [0.63]	8.35 [0.53]	5 [0.32]

* 1.67 gpm/sf [1.13 L/s/m²] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY

FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (cfs [L/s])	
PEAK FLOW RATE (cfs [L/s])	
RETURN PERIOD OF PEAK FLOW (yrs)	
CARTRIDGE FLOW RATE	
CARTRIDGE SIZE (27, 18, LOW DROP (LD))	
MEDIA TYPE (PERLITE, ZPG, PSORB)	
NUMBER OF CARTRIDGES REQUIRED	
FILTER BAY RIM ELEVATION	

PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			

NOTES/SPECIAL REQUIREMENTS:

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' [1524] AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm [L/s]) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft [sq m]).
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONFORMING TO ASTM C-857 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER VAULT.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL VAULT SECTIONS AND ASSEMBLE VAULT.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800.338.1122 513.645.7000 513.645.7993 FAX

SF0612
STORMFILTER VAULT
STANDARD DETAIL

STORMFILTER MANHOLE
N.T.S.

SEE SHEET C0.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT TOWN OF CHAPEL HILL AND NCDOT ENGINEERING DESIGN AND CONSTRUCTION STANDARDS

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

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PHONE: 202.577.6491

Toll Brothers APARTMENT LIVING

BARBEE CHAPEL APARTMENTS
CONDITIONAL ZONING PERMIT DRAWINGS
5101 BARBEE CHAPEL RD
CHAPEL HILL, NC 27517

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 054404 MARIA C. TORRES NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
	11.23.2022	REVISED PER 1ST CZP COMMENTS
	02.21.2023	REVISED PER 2ND CZP COMMENTS

PLAN INFORMATION

PROJECT NO.	TLA-22001
FILENAME	TLA22001-SCMA
CHECKED BY	MCT
DRAWN BY	OVL
SCALE	1" = 20'
DATE	09.29.2022

SHEET

SCM A PLAN VIEW

C9.00

STORMWATER CONTROL MEASURE 'B' CONSTRUCTION SPECIFICATIONS

GENERAL NOTES

1. PRIOR TO CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS AND NOTES SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION.
2. PRIOR TO ANY CONSTRUCTION OR PLACEMENT OF ANY BACKFILL, THE ONSITE GEOTECHNICAL ENGINEER SHALL INSPECT THE EXCAVATION AREA FOR THE UNDERGROUND SCM WITHIN THIS AREA TO ASSESS WHETHER SUITABLE SOILS EXIST AT THE SUBGRADE LEVEL. IF THE CONTRACTOR CONSTRUCTS AND COVERS UP THE UNDERGROUND SCM PRIOR TO INSPECTION, THEN THIS AREA SHALL BE UNCOVERED AND TESTED (TO THE ENGINEER'S AND OWNER'S APPROVAL) AT THE CONTRACTOR'S EXPENSE.
3. THE FACILITY SHALL NOT BE USED AS A TEMPORARY EROSION CONTROL DEVICE (I.E. SEDIMENT TRAP OR SEDIMENT BASIN) DURING CONSTRUCTION.
4. PRIOR TO PLACING STORMFILTER CARTRIDGES WITHIN THE UNDERGROUND SYSTEM , THE CONTRACTOR SHALL REQUEST AN ONSITE MEETING WITH THE DESIGN ENGINEER AND THE EROSION CONTROL INSPECTOR TO ENSURE THE UPSTREAM DRAINAGE AREA IS COMPLETELY STABILIZED (I.E. GOOD VEGETATIVE COVER). IF THE CONTRACTOR DECIDES TO PLACE THE STORMFILTER CARTRIDGES PRIOR TO APPROVAL FROM THE DESIGN ENGINEER AND THE EROSION CONTROL INSPECTOR, THEN THE CONTRACTOR SHALL EXCAVATE/REPLACE, AS NECESSARY, THE COMPONENTS NEEDED FOR THE SYSTEM TO FUNCTION PROPERLY AT HIS / HER EXPENSE SHOULD THE STORMFILTER CARTRIDGES NOT FUNCTION PROPERLY (I.E. WILL NOT DRAIN DUE TO SEDIMENT DEPOSITION) DUE TO AN UNSTABILIZED UPSTREAM DRAINAGE AREA.
5. ONCE CONSTRUCTED, THE STORMFILTER CARTRIDGES SHALL NOT RECEIVE STORMWATER RUNOFF UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA TO THE UNDERGROUND SYSTEM HAS BEEN COMPLETELY STABILIZED AND SITE CONSTRUCTION IS COMPLETE.
6. ALL COMPONENTS OF THE UNDERGROUND SCM SYSTEM (STORMFILTER MANHOLE, CONCRETE VAULT, JOINT / RISER CONNECTIONS, ENDCAPS, ACCESS MANHOLES, ETC.) SHALL BE DESIGNED BY OTHERS. ANY VARIATIONS OR CHANGES MADE FROM THESE SPECIFICATIONS AND DRAWINGS DURING THE ORDERING AND/ OR INSTALLATION OF ALL COMPONENTS MUST BE APPROVED BY THE DESIGN ENGINEER. THE STRUCTURAL DESIGN OF THE UNDERGROUND SCM, ALONG WITH ITS ASSUMPTIONS, IS ALSO BY OTHERS. THE JOHN R. McADAMS COMPANY, INC. AND ITS EMPLOYEES ASSUME NO LIABILITY WITH RESPECT TO ANY ASPECT OF THE STRUCTURAL DESIGN FOR THE UNDERGROUND SCM SYSTEM.
7. ALL PIPE / RISER CONNECTIONS AND JOINTS ASSOCIATED WITH THE UNDERGROUND SCM SYSTEM SHALL BE WATER TIGHT. THE MECHANISM FOR ACHIEVING THIS SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR REVIEW.
8. THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE UNDERGROUND SCM SYSTEM SITE. IT IS ANTICIPATED THAT PUMPING WILL BE NECESSARY IN THE EXCAVATION AREAS. DURING PLACEMENT OF FILL WITHIN THIS AREA (OR OTHER AREAS AS NECESSARY), THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION. THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDE SLOPES ARE STABLE.
9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADHERE TO ALL CURRENT OSHA REGULATIONS FOR CONFINED SPACE ENTRY AND PROVIDE SUCH DURING ENGINEER WALK-THROUGH/INSPECTION.
10. ALL PIPE PENETRATIONS THROUGH A CONCRETE STRUCTURE (I.E. STORMFILTER CARTRIDGE / DETENTION SYSTEM, STORM DRAINAGE MANHOLES, ETC.) SHALL BE MADE WATERTIGHT USING NON-SHRINK CEMENTIOUS GROUT.
11. EXISTING UTILITIES AND STRUCTURES SHOWN, BOTH UNDERGROUND AND ABOVE GROUND, ARE BASED ON A FIELD SURVEY AND THE BEST AVAILABLE RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS PRIOR TO BEGINNING RELATED CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

STORMWATER MANAGEMENT SYSTEM MATERIAL SPECIFICATIONS

1. THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM IS TO BE DESIGNED BY OTHERS. ANY CHANGES TO THE PLANS SHALL BE PROVIDED TO THE DESIGN ENGINEER FOR REVIEW. PRIOR TO INSTALLATION, SHOP DRAWINGS OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE PROVIDED TO THE DESIGN ENGINEER AND TO THE TOWN OF CHAPEL HILL FOR REVIEW.
2. FILTER CARTRIDGES SHALL BE CONTECH STORMFILTERS WITH PHOSPHOSORB MEDIA. INSTALLATION OF THE STORMWATER DEVICE SHALL BE PER THE MANUFACTURER'S INSTALLATION GUIDELINES AND SPECIFICATIONS.
3. ACCESS RISERS SHALL BE INSTALLED PER STRUCTURAL SPECIFICATIONS. ACCESS STEPS / LADDERS SHALL BE ATTACHED TO THE RISERS TO ALLOW FOR ACCESS INTO THE STORMWATER MANAGEMENT SYSTEM.
4. THE 24"Ø DIP OUTLET BARREL OF THE DETENTION SYSTEM SHALL BE CLASS 350 DIP, MEETING THE REQUIREMENTS OF ASTM A716. THE PIPE JOINTS SHALL BE LOCKING JOINTS PER ANSI/AWWA C110/A21.10 OR ANSI/AWWA C153/A21.53 STANDARDS.
5. THE CONTRACTOR SHALL INSTALL THE STORMFILTER SYSTEM PER MANUFACTURERS' SPECIFICATIONS. CONTRACTOR TO PROVIDE A LETTER FROM MATERIAL SUPPLIER(S) STATING MATERIALS MEET THE SPECIFIED STANDARDS PRIOR TO INSTALLATION.
6. COVER AND REVIEW OF SITE CONDITIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE SYSTEM TO BE THE RESPONSIBILITY OF THE MANUFACTURER.

STATEMENT OF RESPONSIBILITY

1. ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THIS FACILITY SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.

FOUNDATION NOTES

1. ONCE THE EXCAVATION IS COMPLETE AND PRIOR TO INSTALLATION OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM, THE ONSITE GEOTECHNICAL ENGINEER SHALL VERIFY THE BEARING CAPACITY OF THE UNDERLYING SOILS TO SERVE AS A FOUNDATION FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM. IF THE ONSITE GEOTECHNICAL ENGINEER DEEMS THE FOUNDATION SOILS AS UNSUITABLE, THEN THE UNSUITABLE MATERIAL SHOULD BE REMOVED DOWN TO A SUITABLE DEPTH AND THEN BUILT BACK UP TO THE CORRECT ELEVATION WITH A COMPACTED BACKFILL MATERIAL THAT IS APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER. THE APPROVED BACKFILL MATERIAL SHOULD HAVE A GRADATION THAT WILL NOT ALLOW THE MIGRATION OF FINES, WHICH COULD CAUSE SETTLEMENT OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM. IF NECESSARY, A GEOTEXTILE FABRIC CAN BE USED TO SEPARATE THE UNDERLYING SOILS AND THE BACKFILL MATERIAL. THIS GEOTEXTILE FABRIC (IF USED) IS TO BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER.
2. PLEASE NOTE THAT IF THE CONTRACTOR CONSTRUCTS AND COVERS UP THE EXCAVATION FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM PRIOR TO INSPECTION, THEN THIS AREA SHALL BE UNCOVERED AND TESTED (TO THE ENGINEER'S AND OWNER'S APPROVAL) AT THE CONTRACTOR'S EXPENSE.
3. THE FOUNDATION SUBGRADE SHALL BE GRADED TO A UNIFORM OR SLIGHTLY SLOPING GRADE PRIOR TO PLACEMENT OF THE BEDDING MATERIAL. IF THE FOUNDATION SUBGRADE WILL BE EXPOSED FOR AN EXTENDED PERIOD OF TIME DURING CONSTRUCTION, THEN IT SHOULD BE GRADED TO A SLIGHT SLOPE SUCH THAT SATURATION OF THE SUBGRADE DOES NOT OCCUR.
4. THE BEDDING MATERIAL FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM SHALL BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER. TYPICALLY, A WELL-GRADED GRANULAR MATERIAL WILL BE USED FOR THE BEDDING. PLEASE NOTE THAT IF CONSTRUCTION EQUIPMENT WILL BE OPERATING FOR AN EXTENDED PERIOD OF TIME ON THE BEDDING, THEN THE APPROPRIATE MEASURES (E.G. ENGINEERED FABRIC, STIFF GEOGRID, ETC.) SHALL BE TAKEN TO ENSURE THE INTEGRITY OF THE BEDDING IS NOT COMPROMISED.
5. THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM THE EXCAVATION. IT IS BEST TO BEGIN THE CONSTRUCTION OF THE DETENTION SYSTEMS AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR WATER TO ESCAPE.
6. THE CONTRACTOR SHALL PROVIDE A FOUNDATION DRAIN FOR THE UNDERGROUND DETENTION SYSTEM DESIGNED BY OTHERS. THE UNDERDRAIN SYSTEM SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATION AND SHALL POSITIVELY DRAIN TO DOWNSTREAM STRUCTURE. THE ONSITE GEOTECHNICAL ENGINEER SHALL DETERMINE IF FOUNDATION DRAINS ARE NOT REQUIRED FOR THE UNDERGROUND SCM SYSTEM. THE DESIGN ENGINEER SHALL BE NOTIFIED FOLLOWING THIS DETERMINATION.

BEDDING NOTES

1. THE EXCAVATION SUB GRADE MUST BE TRANSIT LEVEL.
2. THE EXCAVATION PIT SHALL BE LINED (ON THE BOTTOM AND ALL FOUR SIDES) WITH A NON-WOVEN GEO-TEXTILE (GEOTEX 401 OR APPROVED EQUIVALENT). THE ONSITE GEOTECHNICAL ENGINEER SHALL APPROVE FABRIC FOR USE.
3. THE SUBGRADE FOR THE DETENTION SYSTEM CAN BE A CONCRETE SLAB, OR CLEAN GRANULAR MATERIAL WITH A MAXIMUM AGGREGATE SIZE OF 3/4". THE BEDDING SHALL BE FREE FROM ROCK FORMATIONS, PROTRUDING STONES, FROZEN LUMPS, ROOTS, AND OTHER FOREIGN MATERIAL.
4. PREPARE THE SUBGRADE PER THE ONSITE GEOTECHNICAL ENGINEER'S DIRECTION (APPROXIMATELY 5-6" BELOW GRADE ON WHICH SLAB WILL SET). THE BEDDING MATERIAL SHOULD BE GRADED SUCH THAT A SMOOTH UNIFORM GRADE IS ESTABLISHED TO ALLOW FOR OPTIMUM PLACEMENT OF THE SAND FILTER.
5. THE SUBGRADE MUST SUPPORT THE DETENTION SYSTEM WITHOUT DIFFERENTIAL SETTLEMENT BETWEEN PIECES.
6. IF CONSTRUCTION EQUIPMENT WILL BE OPERATING FOR AN EXTENDED PERIOD OF TIME ON THE BEDDING, THEN THE APPROPRIATE MEASURES (E.G. STIFF GEOGRID, ETC.) SHALL BE TAKEN TO ENSURE THE INTEGRITY OF THE BEDDING IS NOT COMPROMISED.

BACKFILL MATERIAL NOTES

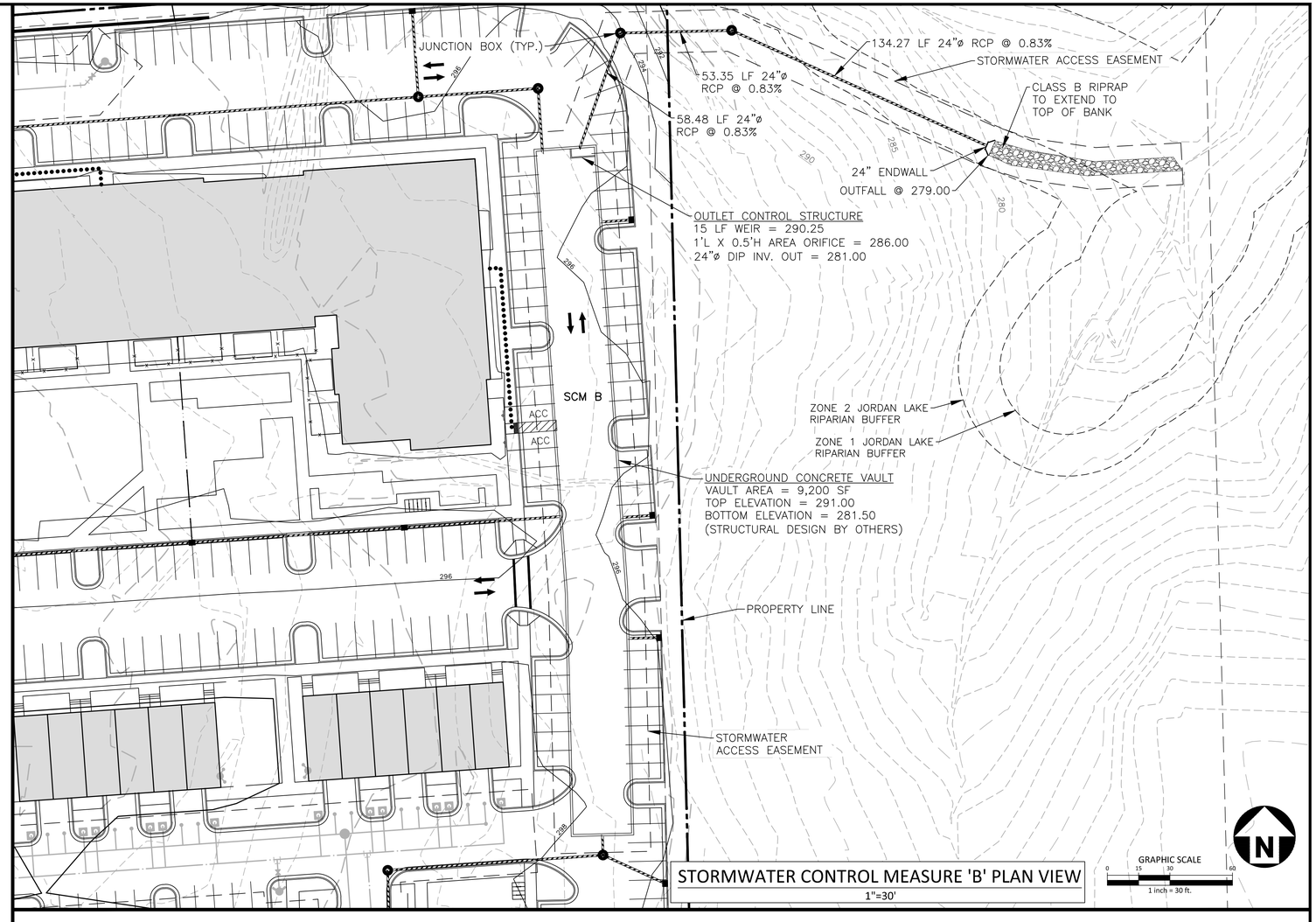
1. THE ON-SITE GEOTECHNICAL ENGINEER SHALL SPECIFY THE BACKFILL MATERIAL FOR THE STORMWATER MANAGEMENT SYSTEM.
2. THE BACKFILL MATERIAL SHOULD BE FREE OF ROCKS, FROZEN LUMPS, AND OTHER FOREIGN MATTER THAT COULD CAUSE HARD SPOTS WITHIN THE BACKFILL MATERIAL, OR THAT COULD DECOMPOSE AND CREATE VOIDS.
3. HIGHLY PLASTIC SILTS, HIGHLY PLASTIC CLAYS, ORGANIC SILTS, ORGANIC CLAYS, AND PEATS SHOULD NOT BE USED AS A BACKFILL MATERIAL.
4. THE BACKFILL MATERIAL SHOULD BE PLACED IN 6" LOOSE LIFTS AND COMPACTED TO 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM-D698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN +/- TWO PERCENT OF ITS OPTIMUM MOISTURE CONTENT.
5. ANY MATERIAL STOCKPILING ON TOP OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE APPROVED BY THE STRUCTURAL DESIGN ENGINEER OR DETENTION SYSTEM MANUFACTURER.

UNDERGROUND VAULT CONSTRUCTION NOTES

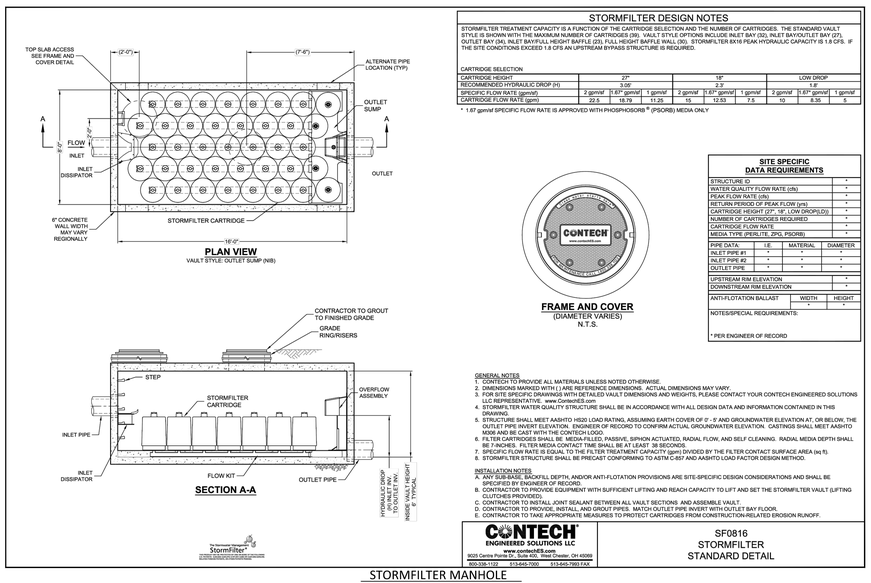
1. UNDERGROUND VAULT CONFIGURATION IS TO BE DESIGNED AND PROVIDED BY OTHERS.
2. ABSOLUTELY NO RUNOFF SHALL ENTER THE UNDERGROUND VAULT UNTIL ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED.
3. MANHOLE ACCESS SHALL BE PROVIDED FOR THE UNDERGROUND VAULT. MANHOLES SHALL BE IN COMPLIANCE WITH TOWN OF CHAPEL HILL STANDARD DETAILS BUT SHALL BE A MINIMUM OF 24 INCHES IN DIAMETER TO COMPLY WITH OSHA CONFINED SPACE REQUIREMENTS (OR MINIMUM OSHA REQUIREMENTS APPLICABLE AT TIME OF CONSTRUCTION). CONTRACTOR SHALL PROVIDE ACCESS LADDERS FOR ACCESS BELOW ALL MANHOLES. MANHOLE COVERS SHALL ALLOW FOR PROPER VENTILATION.

SYSTEM TESTING NOTES

1. PRIOR TO PLACEMENT OF THE BACKFILL MATERIAL AND STORM FILTER CARTRIDGES, CONTRACTOR SHALL TEST FOR WATER TIGHTNESS. ENTRANCES AND EXITS SHALL BE PLUGGED AND THE SYSTEM COMPLETELY FILLED WITH WATER TO DEMONSTRATE WATER TIGHTNESS. WATER TIGHTNESS MEANS NO SIGNIFICANT FOR A PERIOD OF 24 HOURS. SIGNIFICANT LEAKAGE TO BE DETERMINED BY THE CERTIFYING ENGINEER. CONTRACTOR SHALL CALL AND SCHEDULE THE FIELD TESTING OF THE SYSTEM (WATER-TIGHTNESS) WITH THE ENGINEER AT LEAST 2 WORKING DAYS PRIOR TO THE TEST. THE CONTRACTOR SHALL PROVIDE WRITTEN REPORTS TO THE ENGINEER VERIFYING THE WATER TIGHTNESS OF THE STORMWATER VAULT.



STORMWATER CONTROL MEASURE 'B' PLAN VIEW
1"=30'



STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD VAULT STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (39). VAULT STYLE OPTIONS INCLUDE INLET BAY (32), INLET BAY/OUTLET BAY (27), OUTLET BAY (34), INLET BAY/FULL HEIGHT BAFFLE (23), FULL HEIGHT BAFFLE WALL (36). STORMFILTER 6X16 PEAK HYDRAULIC CAPACITY IS 1.8 CFS. IF THE SITE CONDITIONS EXCEED 1.8 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27"		18"		LOW DROP	
RECOMMENDED HYDRAULIC DROP (H)	3.05'		2.3'		1.8'	
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/sf	1.67* gpm/sf	2 gpm/sf	1.67* gpm/sf	2 gpm/sf	1.67* gpm/sf
CARTRIDGE FLOW RATE (gpm)	22.5	18.79	15	12.53	10	8.35

* 1.67 gpm/sf SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY

CARTRIDGE HEIGHT	7.5	5
CARTRIDGE FLOW RATE (gpm)	5	3.33

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs)	*
PEAK FLOW RATE (cfs)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
CARTRIDGE HEIGHT (27", 18", LOW DROP,ELO)	*
NUMBER OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (PERLITE, ZPG, PSORB)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	*	*	*
INLET PIPE #2	*	*	*
OUTLET PIPE	*	*	*

UPSTREAM RIM ELEVATION	*
DOWNSTREAM RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS: *

* PER ENGINEER OF RECORD

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 4' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONFORMING TO ASTM C-857 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. CONTRACTOR TO EXCAVATE BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE APPROVED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER VAULT (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL VAULT SECTIONS AND ASSEMBLE VAULT.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

CONTECH ENGINEERED SOLUTIONS LLC
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9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
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SF0816
STORMFILTER
STANDARD DETAIL

STORMFILTER MANHOLE
N.T.S.

SEE SHEET C0.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT TOWN OF CHAPEL HILL AND NCDOT ENGINEERING DESIGN AND CONSTRUCTION STANDARDS

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

McADAMS
The John R. McAdams Company, Inc.
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license number: C-0293, C-187

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5101 BARBEE CHAPEL RD
CHAPEL HILL, NC 27517

NORTH CAROLINA PROFESSIONAL SEAL 054404 ENGINEER MARIA C. TORRES
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
	11.23.2022	REVISED PER 1ST CZP COMMENTS
	02.21.2023	REVISED PER 2ND CZP COMMENTS

PLAN INFORMATION

PROJECT NO.	TLA-22001
FILENAME	TLA22001-SCMB
CHECKED BY	MCT
DRAWN BY	OVL
SCALE	1" = 30'
DATE	09.29.2022

SHEET

SCM B PLAN VIEW

C9.01

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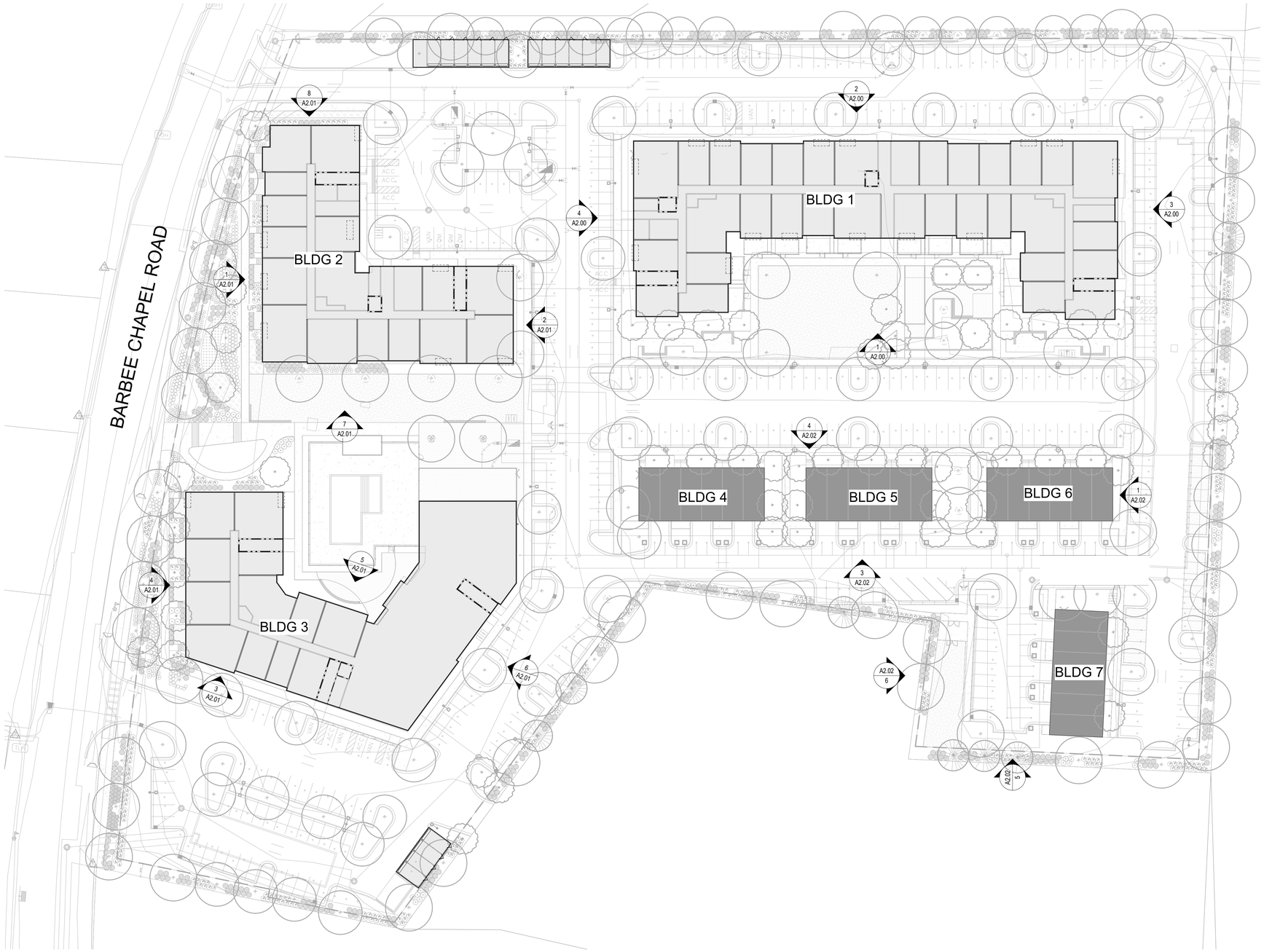

ILLUSTRATIVE SITE PLAN
1" = 40'-0"

1

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CHAPEL HILL, NORTH CAROLINA, 27517

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1.	11/21/2022	REVISED PER 1ST CZP COMMENTS
2.	02/21/2023	REVISED PER 2ND CZP COMMENTS

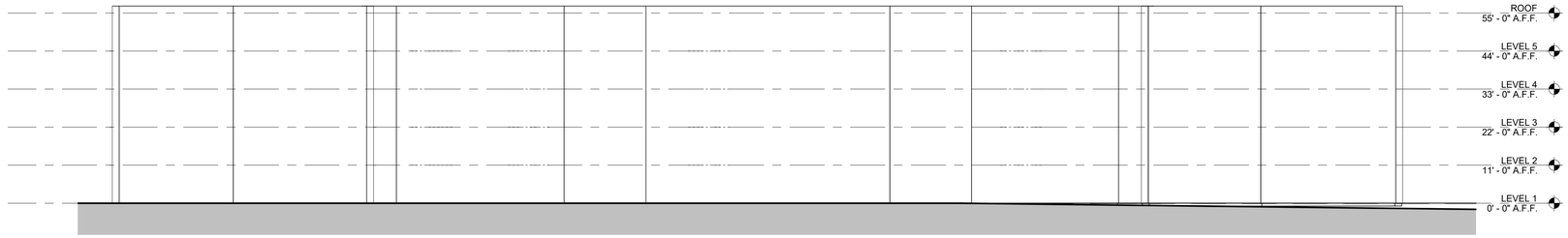
PLAN INFORMTION

PROJECT NO.: P200798

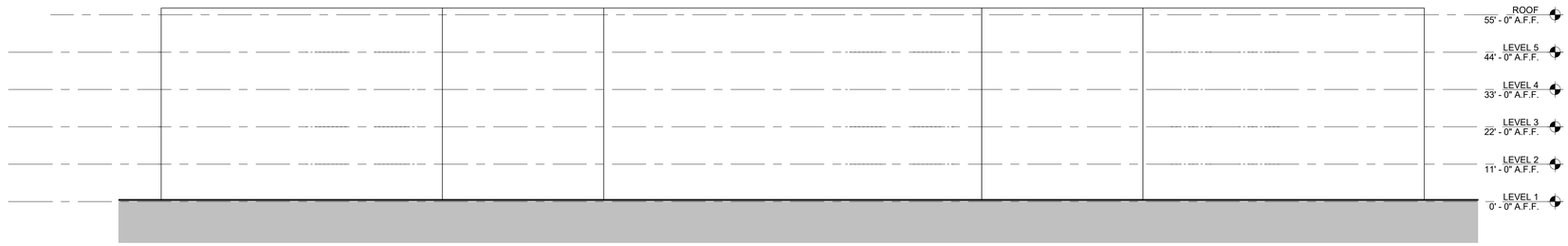
SCALE: AS INDICATED
DATE: 09.29.2022

SITE PLAN

A1.00



BLDG 1- SOUTH ELEV
1" = 20'-0"
1



BLDG 1 - NORTH ELEV
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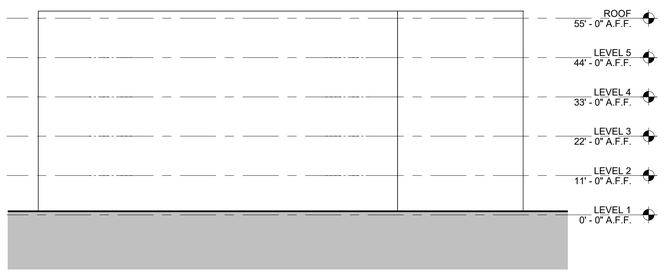
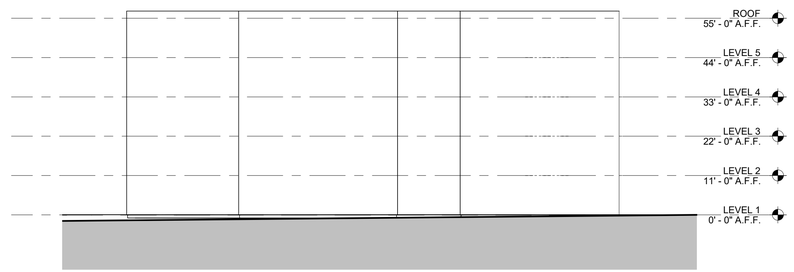
2



BLDG 1- WEST ELEV
1" = 20'-0"
4



BLDG 1 - EAST ELEV
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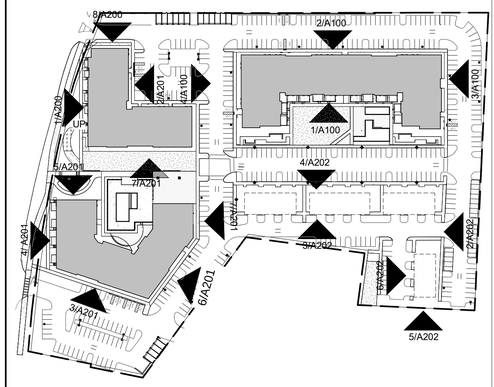
3



KEY PLAN
REF DRAWING:1 / A2.00 SCALE:1 : 1596
0

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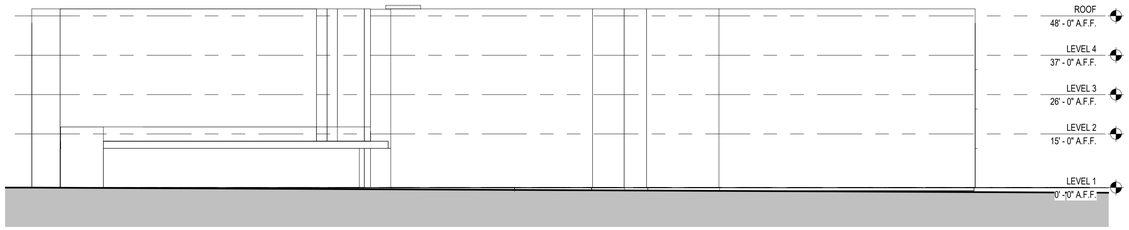
PLAN INFORMTION

PROJECT NO.: P200798

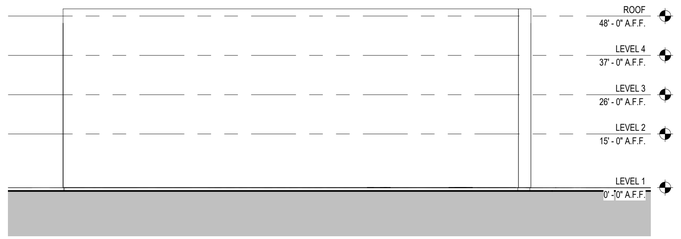
SCALE: AS INDICATED
DATE: 09.29.2022

BUILDING ELEVATIONS

A2.00



BLDG 3 - NORTH ELEV 5
1" = 20'-0"



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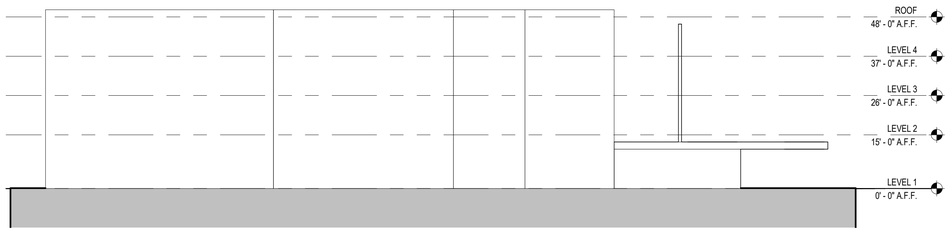
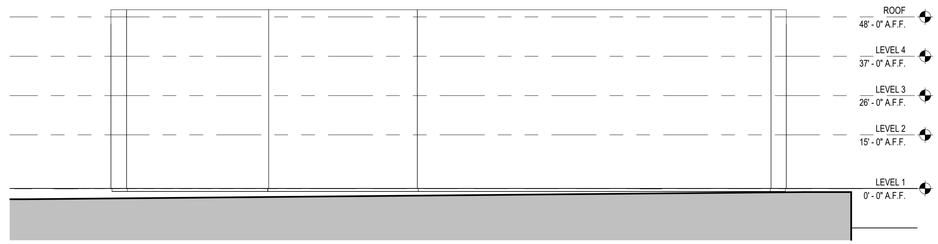
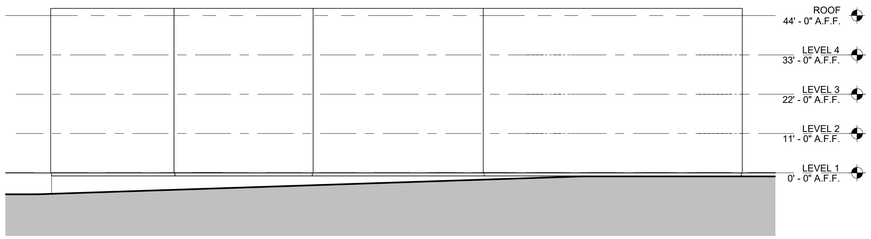
1" = 20'-0"



BLDG 3 - EAST ELEV 6
1" = 20'-0"



BLDG 3 - SOUTH ELEV 3
1" = 20'-0"



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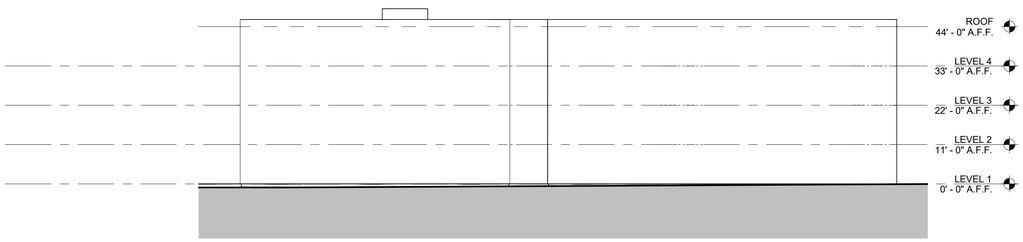

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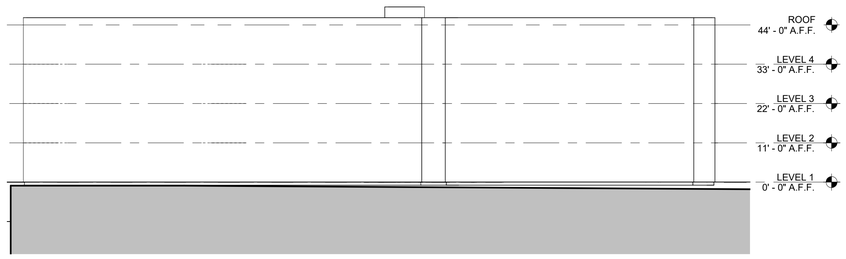
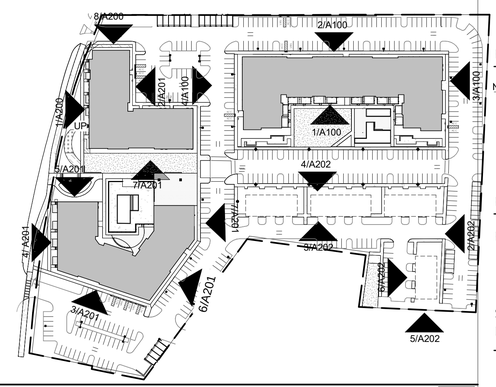
1" = 20'-0"



BLDG 2- NORTH ELEV 8
1" = 20'-0"

BLDG 2 - WEST ELEV 1
1" = 20'-0"



KEY PLAN 0
REF DRAWING:1 / A2.00 SCALE:1 : 1596

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BARBEE CHAPEL APARTMENTS
CONDITIONAL ZONING PERMIT
DRAWINGS
5101 BARBEE CHAPEL RD
CHAPEL HILL, NORTH CAROLINA, 27517

REVISIONS

NO.	DATE	REVISION DESCRIPTION
1.	11/21/2022	REVISED PER 1ST CZP COMMENTS
2.	02/21/2023	REVISED PER 2ND CZP COMMENTS

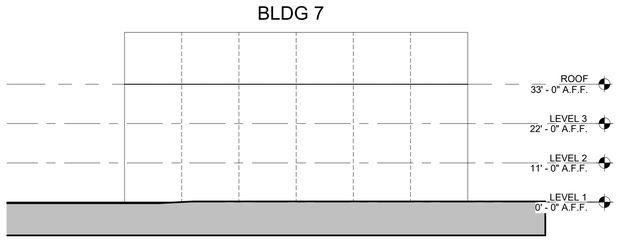
PLAN INFORMTION

PROJECT NO.: P200798

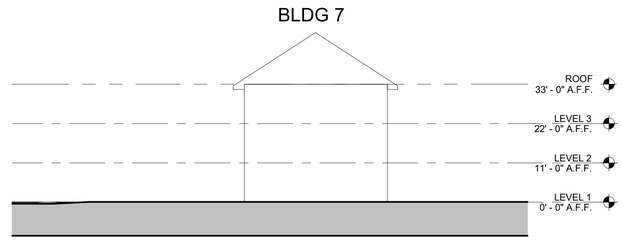
SCALE: AS INDICATED
DATE: 09.29.2022

BUILDING ELEVATIONS

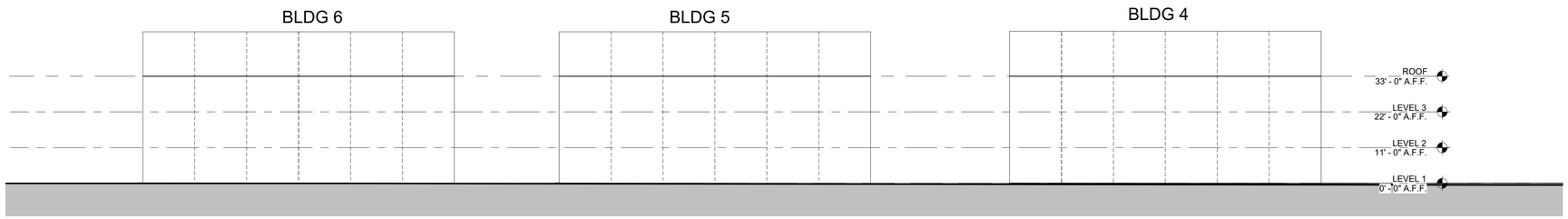
A2.01



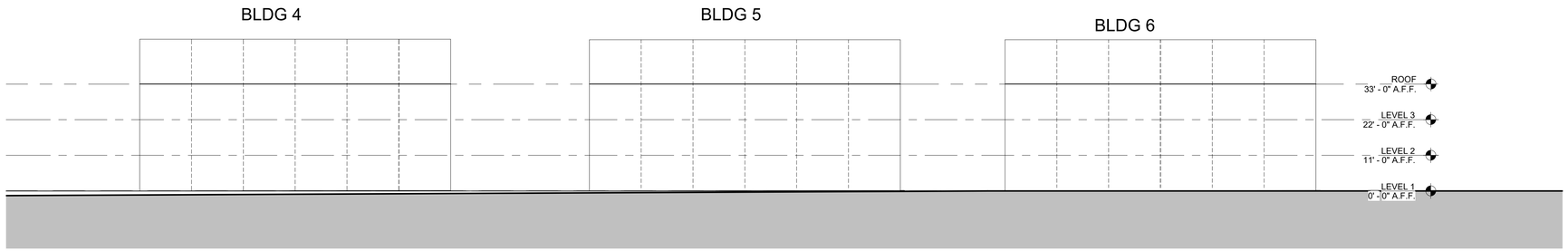
TOWNHOMES- WEST ELEVATION 1" = 20'-0" | 6



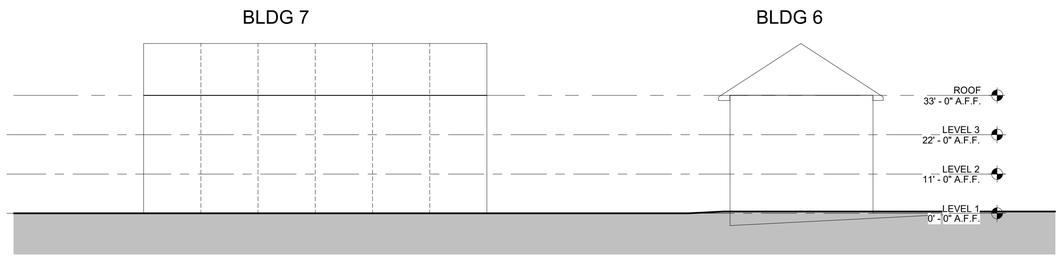
TOWNHOMES- SOUTH ELEVATION 1" = 20'-0" | 5



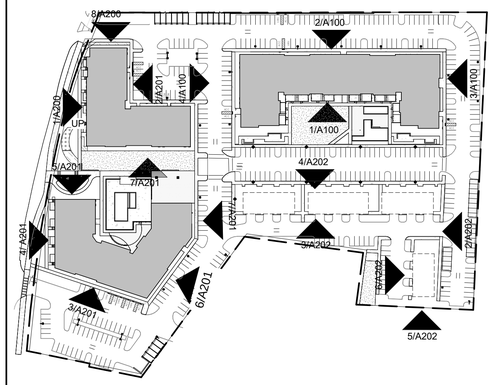
TOWNHOMES- NORTH ELEV 1" = 20'-0" | 4



TOWNHOMES - SOUTH ELEV 1" = 20'-0" | 3



TOWNHOMES- EAST ELEV 1" = 20'-0" | 1



KEY PLAN 1 : 1596 | 0

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Toll Brothers APARTMENT LIVING

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CHAPEL HILL, NORTH CAROLINA, 27517

REVISIONS

NO.	DATE	REVISION DESCRIPTION
1.	11/21/2022	REVISED PER 1ST CZP COMMENTS
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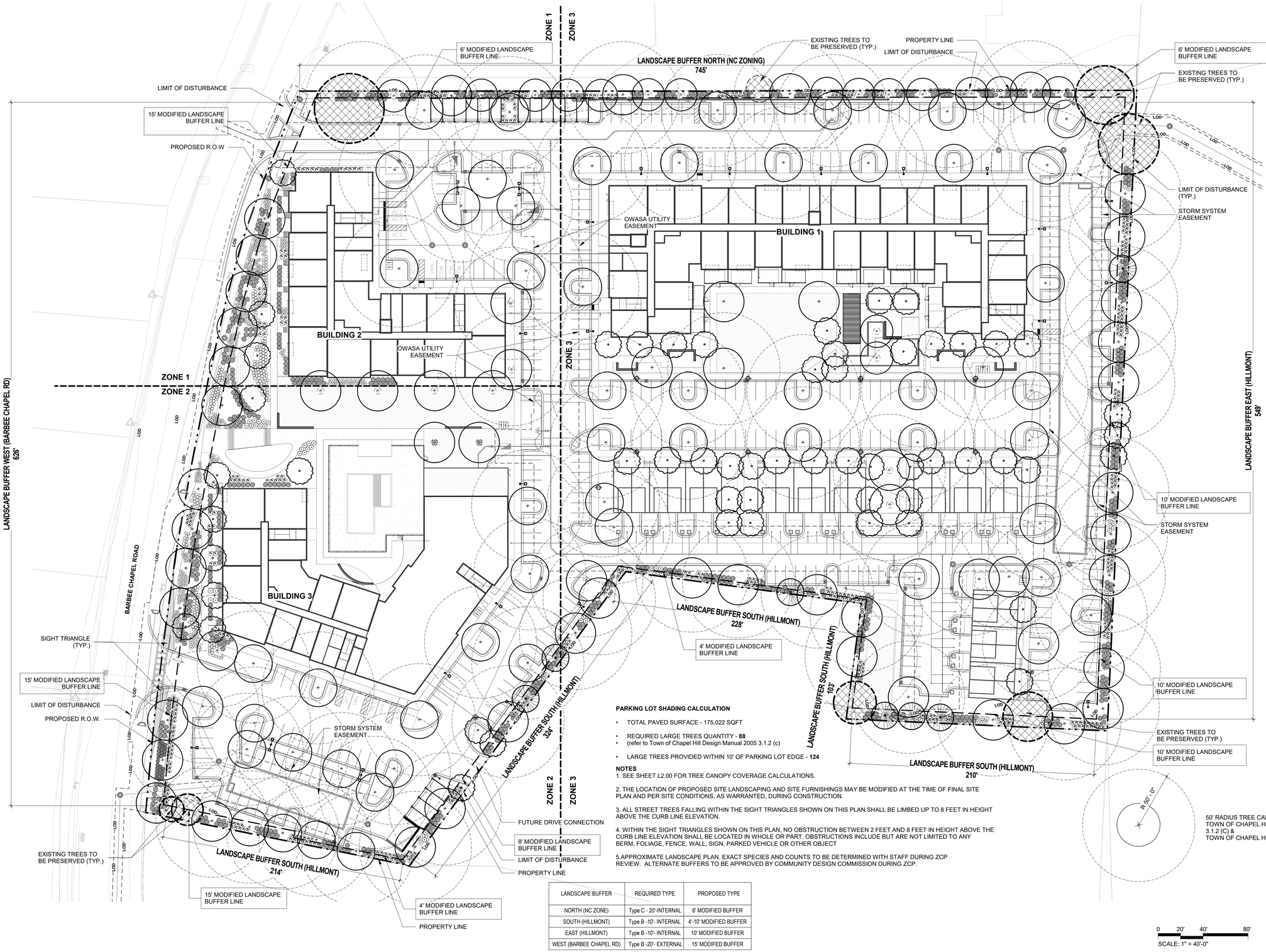
PLAN INFORMTION

PROJECT NO.: P200798

SCALE: AS INDICATED
DATE: 09.29.2022

TOWNHOME ELEVATIONS

A2.02



PARKING LOT SHADING CALCULATION

- TOTAL PAVED SURFACE - 175,022 SQFT
- REQUIRED LARGE TREES QUANTITY - **88**
  (refer to Town of Chapel Hill Design Manual 2005 3.1.2 (c)
- LARGE TREES PROVIDED WITHIN 10' OF PARKING LOT EDGE - **124**

NOTES

1. SEE SHEET L2.00 FOR TREE CANOPY COVERAGE CALCULATIONS.

2. THE LOCATION OF PROPOSED SITE LANDSCAPING AND SITE FURNISHINGS MAY BE MODIFIED AT THE TIME OF FINAL SITE PLAN AND PER SITE CONDITIONS, AS WARRANTED, DURING CONSTRUCTION.

3. ALL STREET TREES FALLING WITHIN THE SIGHT TRIANGLES SHOWN ON THIS PLAN SHALL BE LIMBED UP TO 8 FEET IN HEIGHT ABOVE THE CURB LINE ELEVATION.

4. WITHIN THE SIGHT TRIANGLES SHOWN ON THIS PLAN, NO OBSTRUCTION BETWEEN 2 FEET AND 8 FEET IN HEIGHT ABOVE THE CURB LINE ELEVATION SHALL BE LOCATED IN WHOLE OR PART. OBSTRUCTIONS INCLUDE BUT ARE NOT LIMITED TO ANY BERM, FOLIAGE, FENCE, WALL, SIGN, PARKED VEHICLE OR OTHER OBJECT

5.APPROXIMATE LANDSCAPE PLAN. EXACT SPECIES AND COUNTS TO BE DETERMINED WITH STAFF DURING ZCP REVIEW. ALTERNATE BUFFERS TO BE APPROVED BY COMMUNITY DESIGN COMMISSION DURING ZCP.

LANDSCAPE BUFFER	REQUIRED TYPE	PROPOSED TYPE
NORTH (NC ZONE)	Type C - 20'-INTERNAL	6' MODIFIED BUFFER
SOUTH (HILLMONT)	Type B -10'- INTERNAL	4'-10' MODIFIED BUFFER
EAST (HILLMONT)	Type B -10'- INTERNAL	10' MODIFIED BUFFER
WEST (BARBEE CHAPEL RD)	Type B -20'- EXTERNAL	15' MODIFED BUFFER

*MODIFIED BUFFERS TO BE APPROVED BY TOWN OF CHAPEL HILL COMMUNITY DESIGN COMMISSION

OVERALL SITE PLAN
SCALE: 1" = 40'-0"

1

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DRAWINGS
5101 BARBEE CHAPEL RD

CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT — Stephen E. Parnell

FOR REVIEW ONLY

REVISIONS

NO.	DATE	REVISION DESCRIPTION
1	11/21/2022	1ST ROUND COMMENTS
2	02/21/2023	REVISED PER 2ND CZP COMMENTS

PLAN INFORMTION

PROJECT NO.: P200798

SCALE: AS INDICATED
DATE: 09/29/2022

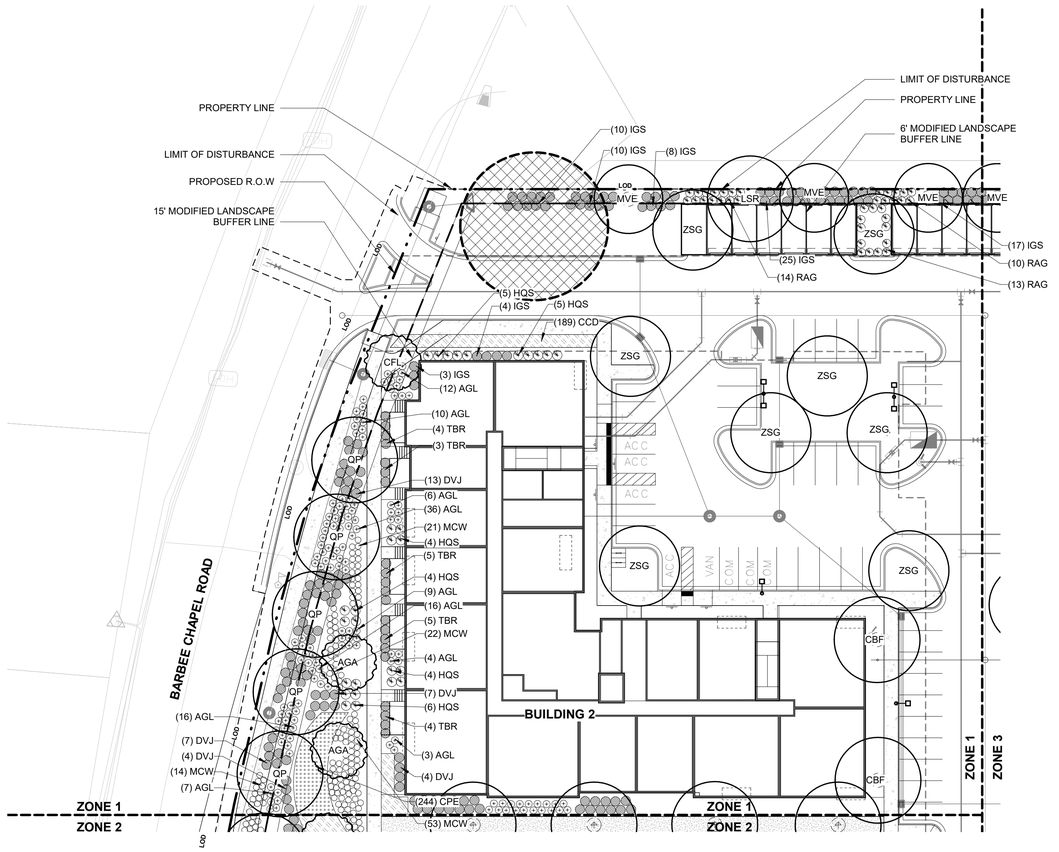
OVERALL SITE PLAN

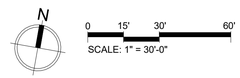
L1.00

TREE SCHEDULE-KEY			
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE
CANOPY TREES			
CBF	Carpinus betulus 'Fastigiata'	European Hornbeam	4" Cal
LSR	Liquidambar styraciflua 'Rotundiloba'	Seedless Sweetgum	4" Cal
MVE	Magnolia virginiana 'Emerald Tower'	Upright Sweetbay Magnolia	3" Cal
QFA	Quercus falcata	Southern Red Oak	4" Cal
QP	Quercus phellos	Willow Oak	4" Cal
ZSG	Zelkova serrata 'Green Vase'	Green Vase Zelkova	2.5" Cal
EVERGREEN CANOPY TREES			
PTA	Pinus taeda	Loblolly Pine	2.5" Cal
UNDERSTORY TREES			
AGA	Amelanchier × grandiflora 'Autumn Brilliance'	Apple Serviceberry	7'-8' Ht.
CFL	Cornus florida	Flowering Dogwood	7'-8' Ht.
Grand total			

SHRUB & ORNAMENTAL GRASS SCHEDULE-KEY			
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE
ORNAMENTAL GRASS			
MCW	Muhlenbergia capillaris 'White Cloud'	White Cloud Muhly Grass	#3
SHRUB			
AGL	Abelia x grandiflora 'Little Richard'	Little Richard Abelia	#3
CAH	Clethra alnifolia 'Hummingbird'	Sweet Pepperbush	#3
DVJ	Distylium × 'Vintage Jade'	Vintage Jade Evergreen Witch Hazel	#3
HIN	Hamamelis × intermedia	Hybrid Witch Hazel	#3
HQS	Hydrangea quercifolia 'Sike's Dwarf'	Dwarf Oakleaf Hydrangea	#5
IGS	Ilex glabra 'Shamrock'	Inkberry Holly	#3
IVE	Ilex verticillata	Winterberry Holly	#3
IVH	Itea virginica 'Henry's Garnet'	Virginia sweetspire	#3
RAG	Rhus aromatica 'Grow-low'	Dwarf Sumac 'Gro-low'	#3
TBR	Taxus baccata 'Repandens'	Spreading English Yew	#3
TMD	Taxus × media 'Densiformis'	Dense Yew	#3

PERENNIAL SCHEDULE - KEY			
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE
CCD	Carex cherokeensis	Cherokee Sedge	#1
CPE	Carex pensylvanica	Sedge	#1





LEGEND

- LIMITS OF DISTURBANCE
- TREE PROTECTION FENCE
- PROPERTY LINE
- CANOPY TREES
- UNDERSTORY TREES
- EVERGREEN TREES
- EXISTING TREES TO BE PRESERVED
- PARKING LOT LIGHTING
- STREET LIGHT

NOTES

1. SEE SHEET L2.00 FOR TREE CANOPY COVERAGE CALCULATIONS.

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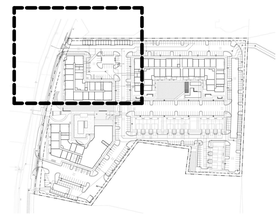

KEY PLAN

PLANTING PLAN ZONE 01
SCALE: 1" = 30'-0"

1

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BARBEE CHAPEL APARTMENTS

CONDITIONAL ZONING PERMIT
DRAWINGS
5101 BARBEE CHAPEL RD
CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT 5078 Jonathon E. Parris

FOR REVIEW ONLY

REVISIONS

NO.	DATE	REVISION DESCRIPTION
1	11/21/2022	1ST ROUND COMMENTS
2	02/21/2023	REVISED PER 2ND CZP COMMENTS

PLAN INFORMTION

PROJECT NO.: P200798

SCALE: AS INDICATED
DATE: 09/29/2022

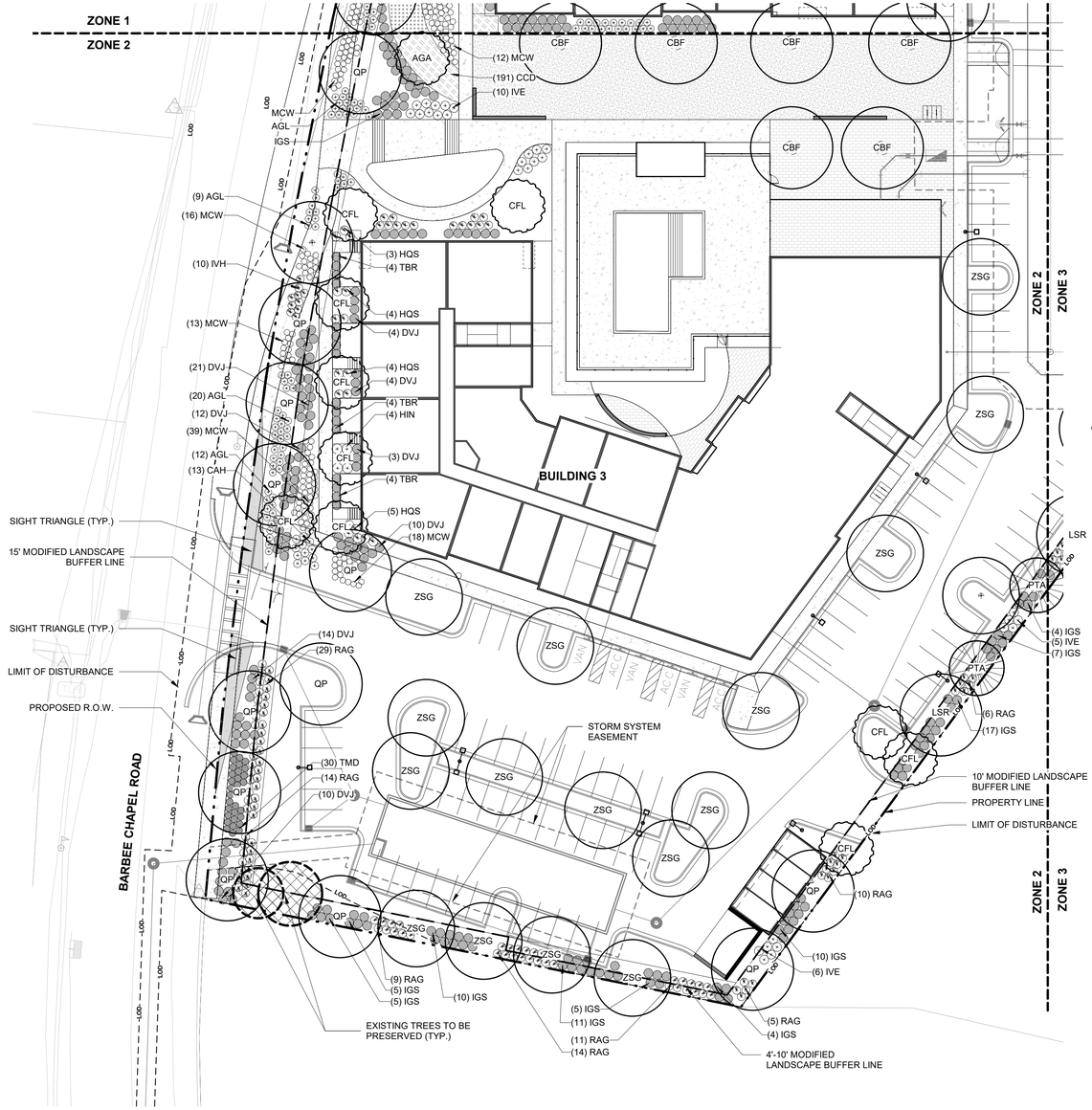
PLANTING PLAN ZONE 01

L1.01

TREE SCHEDULE-KEY			
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE
CANOPY TREES			
CBF	Carpinus betulus 'Fastigiata'	European Hornbeam	4" Cal
LSR	Liquidambar styraciflua 'Rotundiloba'	Seedless Sweetgum	4" Cal
MVE	Magnolia virginiana 'Emerald Tower'	Upright Sweetbay Magnolia	3" Cal
QFA	Quercus falcata	Southern Red Oak	4" Cal
QP	Quercus phello	Willow Oak	4" Cal
ZSG	Zelkova serrata 'Green Vase'	Green Vase Zelkova	2.5" Cal
EVERGREEN CANOPY TREES			
PTA	Pinus taeda	Loblolly Pine	2.5" Cal
UNDERSTORY TREES			
AGA	Amelanchier × grandiflora 'Autumn Brilliance'	Apple Serviceberry	7'-8' Ht.
CFL	Cornus florida	Flowering Dogwood	7'-8' Ht.
Grand total			

SHRUB & ORNAMENTAL GRASS SCHEDULE-KEY			
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE
ORNAMENTAL GRASS			
MCW	Muhlenbergia capillaris 'White Cloud'	White Cloud Muhly Grass	#3
SHRUB			
AGL	Abelia x grandiflora 'Little Richard'	Little Richard Abelia	#3
CAH	Clethra alnifolia 'Hummingbird'	Sweet Pepperbush	#3
DVJ	Distylium × 'Vintage Jade'	Vintage Jade Evergreen Witch Hazel	#3
HIN	Hamamelis × intermedia	Hybrid Witch Hazel	#3
HQS	Hydrangea quercifolia 'Sike's Dwarf'	Dwarf Oakleaf Hydrangea	#5
IGS	Ilex glabra 'Shamrock'	Inkberry Holly	#3
IVE	Ilex verticillata	Winterberry Holly	#3
IVH	Itea virginica 'Henry's Garnet'	Virginia sweetspire	#3
RAG	Rhus aromatica 'Grow-low'	Dwarf Sumac 'Gro-low'	#3
TBR	Taxus baccata 'Repandens'	Spreading English Yew	#3
TMD	Taxus × media 'Densiformis'	Dense Yew	#3

PERENNIAL SCHEDULE - KEY			
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE
CCD	Carex cherokeensis	Cherokee Sedge	#1
CPE	Carex pensylvanica	Sedge	#1



LEGEND

- LIMITS OF DISTURBANCE
- TREE PROTECTION FENCE
- PROPERTY LINE
- CANOPY TREES
- UNDERSTORY TREES
- EVERGREEN TREES
- EXISTING TREES TO BE PRESERVED
- PARKING LOT LIGHTING
- STREET LIGHT

NOTES

1. SEE SHEET L2.00 FOR TREE CANOPY COVERAGE CALCULATIONS.

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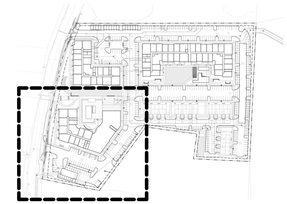

KEY PLAN

PLANTING PLAN ZONE 02
SCALE: 1" = 30'-0"

1

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NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT Jennifer E. Fearon

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PLAN INFORMTION

PROJECT NO.: P200798

SCALE: AS INDICATED
DATE: 09/29/2022

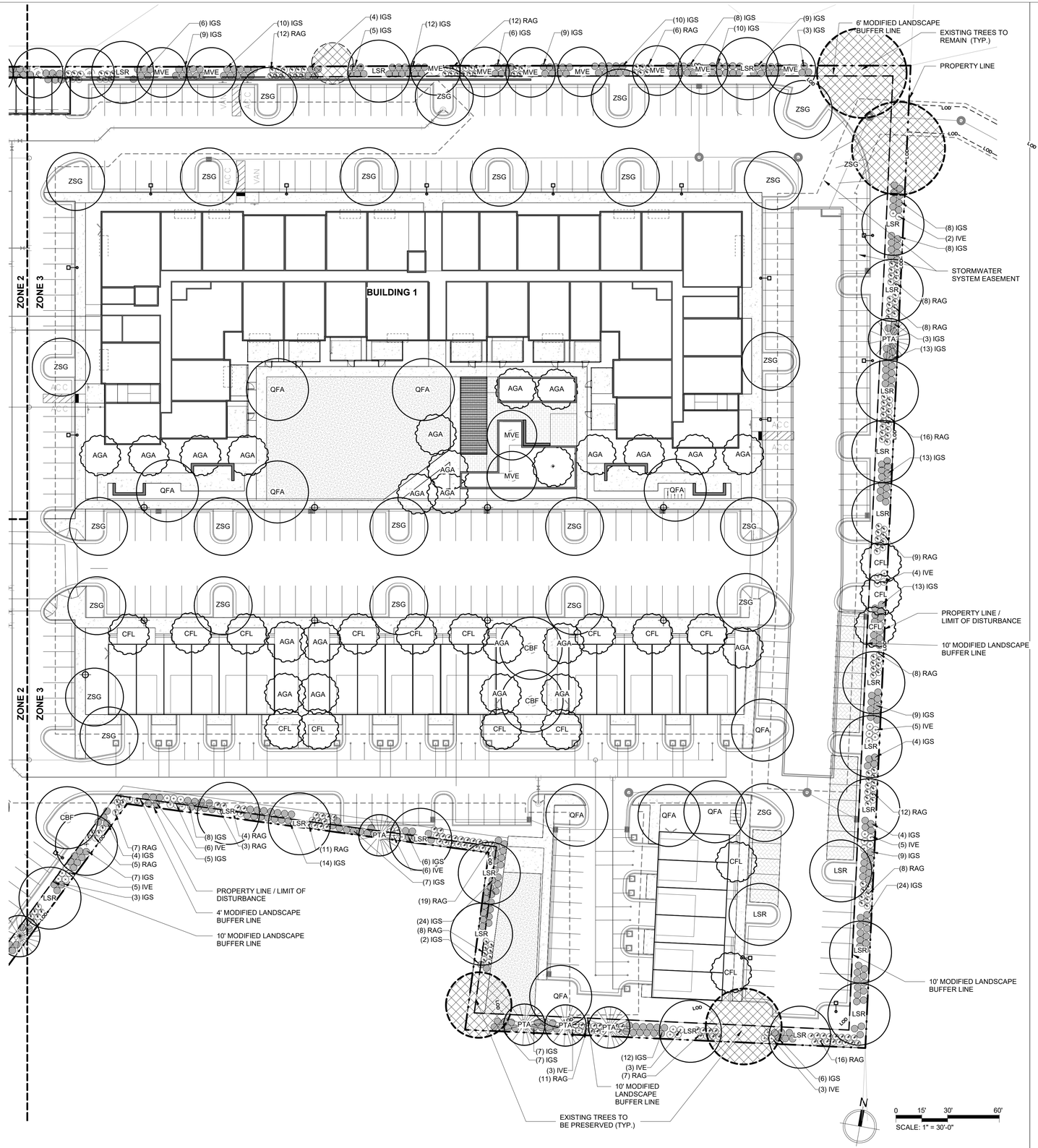
PLANTING PLAN ZONE 2

L1.02

TREE SCHEDULE-KEY			
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE
CANOPY TREES			
CBF	Carpinus betulus 'Fastigiata'	European Hornbeam	4" Cal
LSR	Liquidambar styraciflua 'Rotundiloba'	Seedless Sweetgum	4" Cal
MVE	Magnolia virginiana 'Emerald Tower'	Upright Sweetbay Magnolia	3" Cal
QFA	Quercus falcata	Southern Red Oak	4" Cal
QP	Quercus phello	Willow Oak	4" Cal
ZSG	Zelkova serrata 'Green Vase'	Green Vase Zelkova	2.5" Cal
EVERGREEN CANOPY TREES			
PTA	Pinus taeda	Loblolly Pine	2.5" Cal
UNDERSTORY TREES			
AGA	Amelanchier × grandiflora 'Autumn Brilliance'	Apple Serviceberry	7'-8' Ht.
CFL	Cornus florida	Flowering Dogwood	7'-8' Ht.
Grand total			

SHRUB & ORNAMENTAL GRASS SCHEDULE-KEY			
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE
ORNAMENTAL GRASS			
MCW	Muhlenbergia capillaris 'White Cloud'	White Cloud Muhly Grass	#3
SHRUB			
AGL	Abelia x grandiflora 'Little Richard'	Little Richard Abelia	#3
CAH	Clethra alnifolia 'Hummingbird'	Sweet Pepperbush	#3
DVJ	Distylium × 'Vintage Jade'	Vintage Jade Evergreen Witch Hazel	#3
HIN	Hamamelis × intermedia	Hybrid Witch Hazel	#3
HQS	Hydrangea quercifolia 'Sike's Dwarf'	Dwarf Oakleaf Hydrangea	#5
IGS	Ilex glabra 'Shamrock'	Inkberry Holly	#3
IVE	Ilex verticillata	Winterberry Holly	#3
IVH	Itea virginica 'Henry's Garnet'	Virginia sweetspire	#3
RAG	Rhus aromatica 'Grow-low'	Dwarf Sumac 'Gro-low'	#3
TBR	Taxus baccata 'Repandens'	Spreading English Yew	#3
TMD	Taxus × media 'Densiformis'	Dense Yew	#3

PERENNIAL SCHEDULE - KEY			
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE
CCD	Carex cherokeensis	Cherokee Sedge	#1
CPE	Carex pensylvanica	Sedge	#1



LEGEND

- LIMITS OF DISTURBANCE
- TREE PROTECTION FENCE
- PROPERTY LINE
- CANOPY TREES
- UNDERSTORY TREES
- EVERGREEN TREES
- EXISTING TREES TO BE PRESERVED
- PARKING LOT LIGHTING
- STREET LIGHT

NOTES

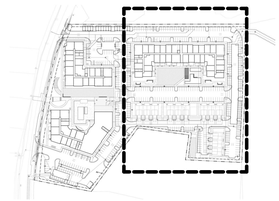
1. SEE SHEET L2.00 FOR TREE CANOPY COVERAGE CALCULATIONS.

2. THE LOCATION OF PROPOSED SITE LANDSCAPING AND SITE FURNISHINGS MAY BE MODIFIED AT THE TIME OF FINAL SITE PLAN AND PER SITE CONDITIONS, AS WARRANTED, DURING CONSTRUCTION.

3. ALL STREET TREES FALLING WITHIN THE SIGHT TRIANGLES SHOWN ON THIS PLAN SHALL BE LIMBED UP TO 8 FEET IN HEIGHT ABOVE THE CURB LINE ELEVATION.

4. WITHIN THE SIGHT TRIANGLES SHOWN ON THIS PLAN, NO OBSTRUCTION BETWEEN 2 FEET AND 8 FEET IN HEIGHT ABOVE THE CURB LINE ELEVATION SHALL BE LOCATED IN WHOLE OR PART. OBSTRUCTIONS INCLUDE BUT ARE NOT LIMITED TO ANY BERM, FOLIAGE, FENCE, WALL, SIGN, PARKED VEHICLE OR OTHER OBJECT

5.APPROXIMATE LANDSCAPE PLAN. EXACT SPECIES AND COUNTS TO BE DETERMINED WITH STAFF DURING ZCP REVIEW. ALTERNATE BUFFERS TO BE APPROVED BY COMMUNITY DESIGN COMMISSION DURING ZCP.



PLANTING PLAN ZONE 03
SCALE: 1" = 30'-0"

1 KEY PLAN

1000 lancaster street
suite 430
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250 Summer Street
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CLIENT

TOLL BROTHERS APARTMENT LIVING
1140 VIRGINIA DR
FORT WASHINGTON,PA, 19034
PHONE:202.577.6491

Toll Brothers APARTMENT LIVING

BARBEE CHAPEL APARTMENTS
CONDITIONAL ZONING PERMIT DRAWINGS
5101 BARBEE CHAPEL RD
CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA CERTIFIED LANDSCAPE TECHNICIAN — FOR REVIEW ONLY — Jonathan E. Pearson

REVISIONS

NO.	DATE	REVISION DESCRIPTION
1	11/21/2022	1ST ROUND COMMENTS
2	02/21/2023	REVISED PER 2ND CZP COMMENTS

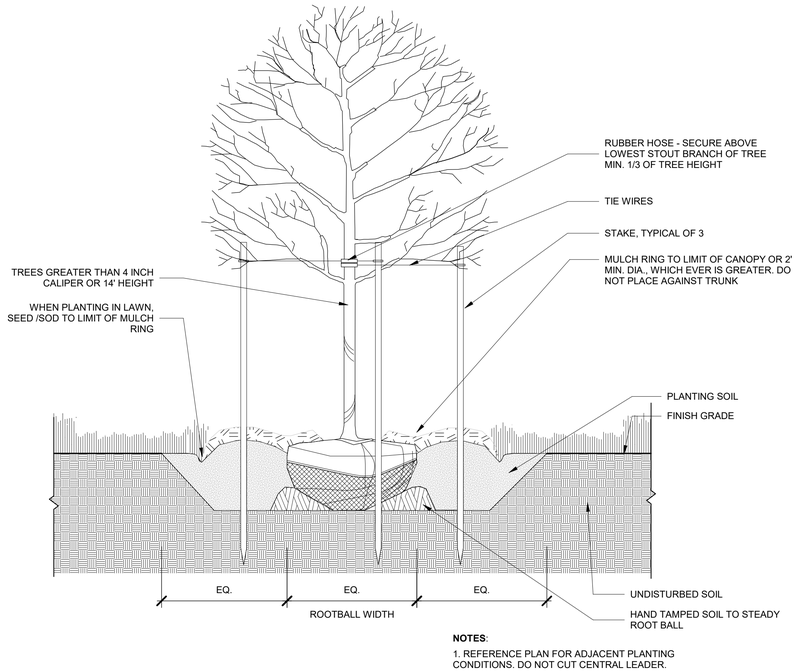
PLAN INFORMTION

PROJECT NO.: P200798

SCALE: AS INDICATED
DATE: 09/29/2022

PLANTING PLAN ZONE 03

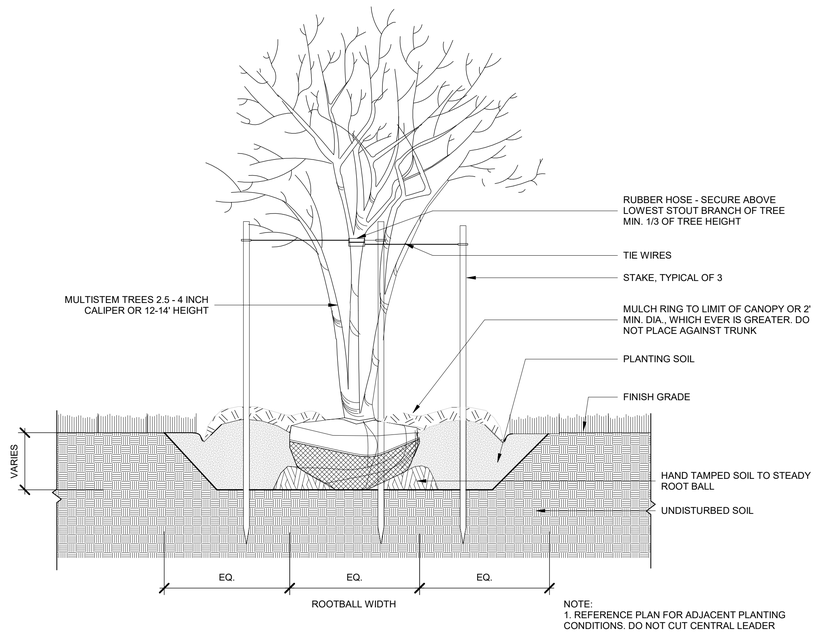
L1.03



NOTES:

1. REFERENCE PLAN FOR ADJACENT PLANTING CONDITIONS. DO NOT CUT CENTRAL LEADER.

SHADE TREE PLANTING
SCALE: 3/4" = 1'-0" | 3



NOTE:
1. REFERENCE PLAN FOR ADJACENT PLANTING CONDITIONS. DO NOT CUT CENTRAL LEADER

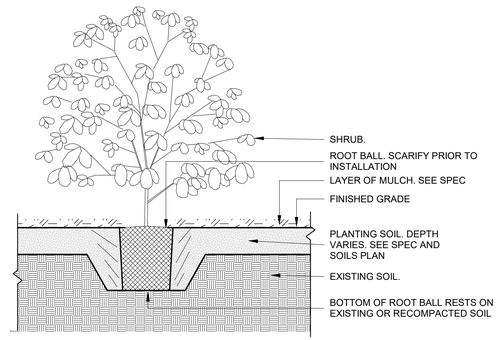
ORNAMENTAL TREE PLANTING
SCALE: 3/4" = 1'-0" | 1

TREE SCHEDULE						
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE	ROOT	COUNT	COMMENTS
CANOPY TREES						
CBF	Carpinus betulus 'Fastigiata'	European Hornbeam	4" Cal	B&B	11	Limb lowest branch to 7'-0"
LSR	Liquidambar styraciflua 'Rotundiloba'	Seedless Sweetgum	4" Cal	B&B	26	Limb lowest branch to 7'-0"
MVE	Magnolia virginiana 'Emerald Tower'	Upright Sweetbay Magnolia	3" Cal	B&B	16	
QFA	Quercus falcata	Southern Red Oak	4" Cal	B&B	10	Limb lowest branch to 7'-0"
QP	Quercus phello	Willow Oak	4" Cal	B&B	18	Limb lowest branch to 7'-0"
ZSG	Zelkova serrata 'Green Vase'	Green Vase Zelkova	2.5" Cal	B&B	50	Limb lowest branch to 7'-0"
EVERGREEN CANOPY TREES						
PTA	Pinus taeda	Loblolly Pine	2.5" Cal	B&B	7	
UNDERSTORY TREES						
AGA	Amelanchier × grandiflora 'Autumn Brilliance'	Apple Serviceberry	7'-8' Ht.	B&B	27	
CFL	Cornus florida	Flowering Dogwood	7'-8' Ht.	B&B	29	
Grand total					194	

SHRUB & ORNAMENTAL GRASS SCHEDULE				
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE	COMMENTS
SHRUB				
AGL	Abelia x grandiflora 'Little Richard'	Little Richard Abelia	#3	36" o.c.
CAH	Clethra alnifolia 'Hummingbird'	Sweet Pepperbush	#3	36" o.c.
DVJ	Distylium × 'Vintage Jade'	Vintage Jade Evergreen Witch Hazel	#3	48" o.c.
HIN	Hamamelis × intermedia	Hybrid Witch Hazel	#3	48" o.c.
HQS	Hydrangea quercifolia 'Sike's Dwarf'	Dwarf Oakleaf Hydrangea	#5	30" o.c.
IGS	Ilex glabra 'Shamrock'	Inkberry Holly	#3	36" o.c.
IVE	Ilex verticillata	Winterberry Holly	#3	48" o.c.
IVH	Itea virginica 'Henry's Garnet'	Virginia sweetspire	#3	36" o.c.
RAG	Rhus aromatica 'Grow-low'	Dwarf Sumac 'Gro-low'	#3	48" o.c.
TBR	Taxus baccata 'Repandens'	Spreading English Yew	#3	24"-30" spd.
TMD	Taxus × media 'Densiformis'	Dense Yew	#3	48" o.c.

When selecting shrub species, a minimum of 50% of the total number of required shrubs should be evergreen.

PERENNIAL SCHEDULE				
PLANT ID	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING INCHES
CCD	Carex cherokeensis	Cherokee Sedge	#1	18
CPE	Carex pensylvanica	Sedge	#1	18



SHRUB PLANTING DETAIL
SCALE: 3/4" = 1'-0" | 2

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Toll Brothers APARTMENT LIVING

BARBEE CHAPEL APARTMENTS

CONDITIONAL ZONING PERMIT

DRAWINGS

5101 BARBEE CHAPEL RD

CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT Jennifer E. Parsons

FOR REVIEW ONLY

REVISIONS

NO.	DATE	REVISION DESCRIPTION
1	11/21/2022	1ST ROUND COMMENTS
2	02/21/2023	REVISED PER 2ND CZP COMMENTS

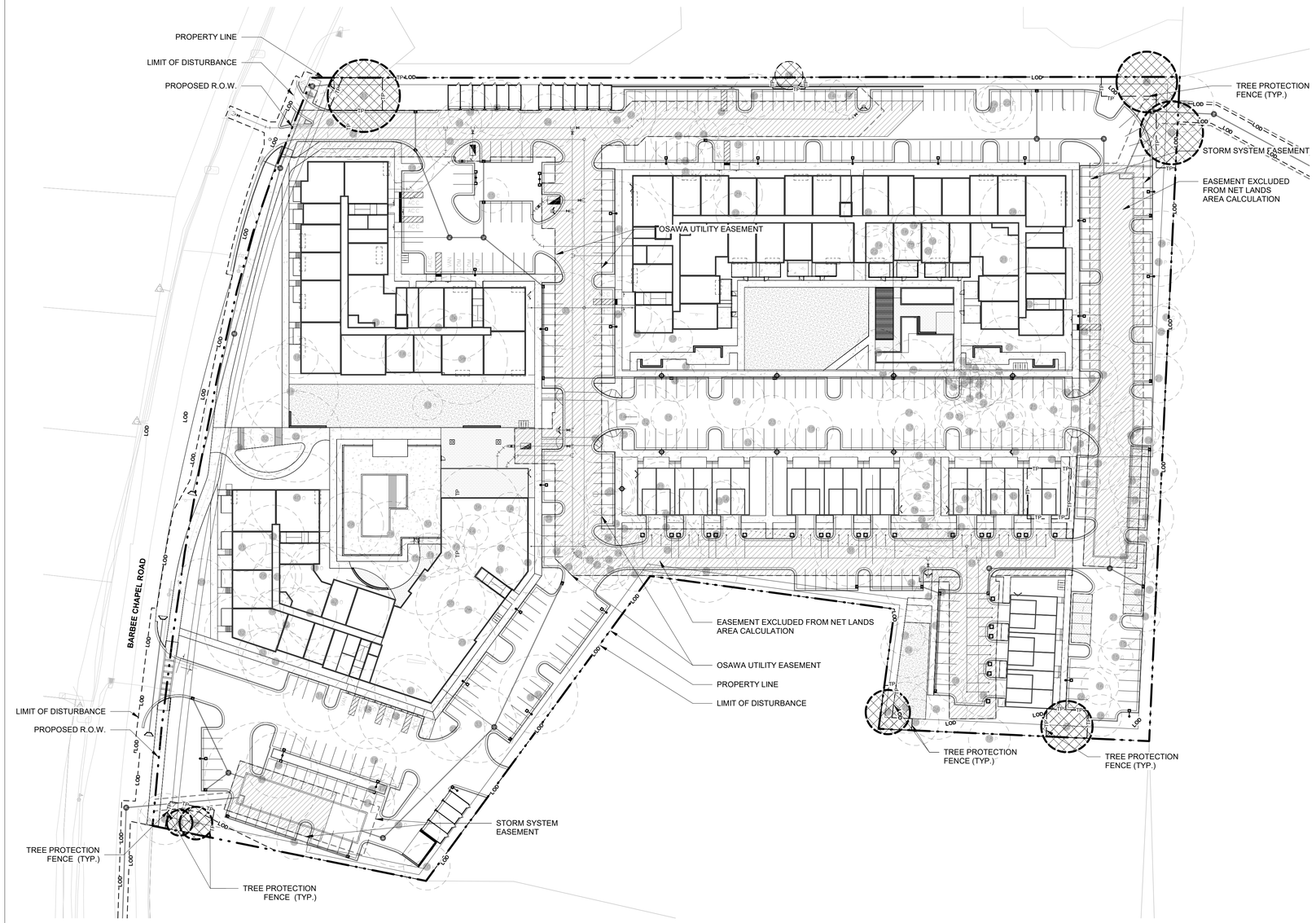
PLAN INFORMTION

PROJECT NO.: P200798

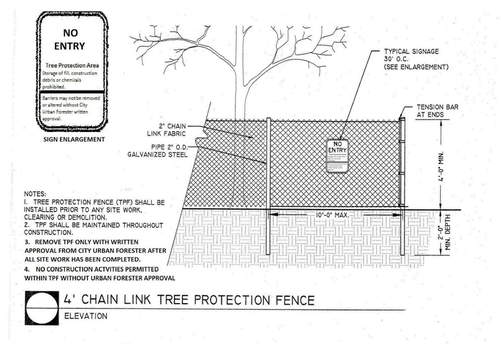
SCALE: AS INDICATED
DATE: 09/29/2022

PLANTING DETAILS AND PLANTING SCHEDULE

L1.04



TREE PROTECTION PLAN 1
SCALE: 1" = 50'-0"



TREE PROTECTION FENCE DETAIL 2
SCALE: 3/16" = 1'-0"

LEGEND

- PRESERVED EX. TREES CRITICAL ROOT ZONE
- SIZE (TRUNK DIAMETER)
- SPECIES TYPE
- EXISTING SPECIMEN TREES TO BE REMOVED (18 F)
- LOD — LIMITS OF DISTURBANCE
- TP — TREE PROTECTION FENCE.
- PROPERTY LINE
- UTILITY EASEMENT
- EASEMENT AREA EXLUDED FROM NET LANDS AREA CALCULATION

EXISTING TREE LEGEND

A	ASH
B	BEECH
C	CEDAR
E	ELM
G	SWEET GUM
H	HICKORY
M	MAPLE
O	OAK
P	PINE

- RARE TREES(refer to LUMO Section 5.7.6) - 0
- SIGNIFICANT TREE STANDS - *NONE* (refer to Tree Evaluation Report)
- SPECIMEN TREES (refer to LUMO Section 5.7.6) - 240
- SPECIMEN TREES TO BE PROTECTED - 8
- SPECIMEN TREES TO BE REMOVED - 232

- LOT SIZE - 455,841 SQF
- NET LOT SIZE (excl. easements and ROWs) - 380,084 SQF
- 30% REQUIRED TREE CANOPY COVERAGE (Multi-Family Residential) - 114,025 SQF
- AREA OF EXISTING CANOPY PROTECTED - 11,535 SQF
- **CANOPY DEFICIT - 102,490 SQF**

- **REPLACEMENT TREES REQUIRED** (as per LUMO Section 5.7.2(c)) - **205**
- **REPLACEMENT TREES PROPOSED -**
  Proposed Canopy Trees: 140
  Credits on Trees over 4" Cal (refer to LUMO Section 5.7.2 (c)): 66
  Total:206

NOTES:

1. Protective fencing. Fences, or other equally effective measures as determined by the town manager, shall be used to protect areas identified on an approved landscape protection plan during demolition and construction activity. Protective fencing shall be installed according to town standards. Field adjustments may be allowed subject to prior approval by the town manager. All land disturbing activity, storage of equipment, building material, soil, and other debris shall be kept outside the protected areas.

2. Landscaping activities taking place after the removal of protective fencing shall be accomplished with light machinery or hand labor and in accordance with the town's landscaping standards and specifications. This requirement should be noted on the plans.

3. Prior to the commencement of any activities requiring a zoning compliance permit, a pre-construction conference with the town's urban forester or landscape architect shall take place to review procedures for protection and management of all protected landscape elements identified on the landscape protection plan.

4. On-site supervision. For all development other than that related to single-family and two-family dwellings on individual zoning lots, the following on-site supervision is required:

   i. The applicant shall designate as landscape protection supervisors one or more persons who have completed instruction in landscape protection procedures with the town.

   ii. It shall be the duty of the landscape protection supervisor to ensure the protection of new or existing landscape elements, as defined in the landscape protection plan. The approved landscape protection supervisor shall supervise all site work to assure that development activity conforms to provisions of the approved landscape protection plan. At least one (1) identified landscape protection supervisor shall be present on the development site at all times when activity that could damage or disturb soil and adjacent landscape elements occurs such as:
   - Clearing and grubbing;
   - Any excavation, grading, trenching or moving of soil;
   - Removal, installation, or maintenance of all landscape elements and landscape protection devices; or
   - Delivery, transporting, and placement of construction materials and equipment on site.

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CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT SEAL 3387 Jonathan E. Fannin
FOR REVIEW ONLY

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PLAN INFORMTION

PROJECT NO.: P200798

SCALE: AS INDICATED
DATE: 09/29/2022

TREE PROTECTION PLAN

L2.00

BARBEE CHAPEL APARTMENTS – Conditional Zoning Permit

Barbee Chapel Rd
Chapel Hill, NC (Durham County)

AFFORDABLE HOUSING PROPOSAL

The developer is proposing that a total of 31 apartments be rented at affordable rates, with 15 units at 65% AMI and 16 units at 80% AMI levels. The affordable units will be located throughout the project, rather than concentrated in a single building or location, and there will be an appropriate mix of units (efficiency, 1 BR, 2 BR and 3 BR).

DEVELOPER'S PROGRAM

Toll Brothers Apartment Living is excited to present a Rezoning Application for approximately 11 acres located along the east side of Barbee Chapel Road near the intersection with Stancell Rd and NC Hwy 54. The site is south of the existing Valero gas station and Clean Wheels Car Wash and currently is bisected by a private road, Pearl Lane. The current use of the assemblage is single-family dwellings on the former Pearl Sparrow Farm, built when the location was on the outer edge of Chapel Hill and long before the construction of Meadowmont Village, The Courtyard by Marriott hotel, the William and Ida Friday Center for Continuing Education and the associated UNC Park & Ride lots that are used by university and hospital staff, all of which are within a 10-minute (0.4 miles or 2,112 feet) walk of this site. The proposed development reflects the changing character of this area of Chapel Hill and the need for market-rate and affordable housing. Additionally, by building garden style apartments with surface parking, the developer is able to provide more moderately priced apartments than would be possible with other development types.

The development team aspires to prioritize the town's goals for Connectivity, Placemaking and Sustainability rather than replicate the car-centric development more commonly seen in our region and throughout the country.

CONNECTIVITY: Significant effort is made to prioritize pedestrian and bicycle movement within the project and to create connections to the nearby transit corridor. Indeed, this location is a five-minute walk to regional bus lines (GoTriangle) on NC-54 that serve both the university and employers in Durham County (notably Southpoint and RTP) and a 10-minute walk along public sidewalks to the town's high-frequency bus service to UNC at the Friday Center. Combined, the two bus systems provide bus service to the UNC Campus and UNC Hospital at less-than-five-minute intervals during peak travel times, as well as bus service on nights and weekends, a rarity in this region.

The developer proposes a multi-modal greenway along Barbee Chapel Road for the full length of its property line, extending the multi-modal network for residents in nearby apartments (The Morgan) and condominium (Finley Forest) communities. This multimodal path, if continued on the Hillmont property to the south, will provide area pedestrians and cyclists off-road connectivity to The Farm, UNC's recreational area at the south and to goods and services at Meadowmont Village to the north, East 54 to the west and Falconbridge to the east. Additionally, this plan proposes direct connections to adjacent parcels to increase connectivity and help reduce bottlenecks and congestion that are associated with disconnected sites.

PLACEMAKING: The buildings in this community, ranging in height from three to five stories, frame a large tree-lined formal green and smaller shaded formal and informal parks as central features for the future community. They provide outdoor rooms for formal programming such as community cook-outs and outdoor movies and informal gatherings or quiet time outdoors. The proposed pedestrian-and-bicycles-only entrance from Barbee Chapel Road, between Buildings 2 and 3, provides a glimpse into the apartment community to passers-by and reinforces the pedestrian-oriented design, with its easy ped-bike connectivity to the larger community. The proposed site plan offers connections to possible future development on adjacent properties, allowing the proposed and future adjacent developments to be experienced as one “place” rather than individual projects.

SUSTAINABILITY: The proposed development will require approval of an erosion and sediment control plan through Durham County. The plan will minimize impacts to off-site areas and keep erosive sediment-laden runoff on site for treatment prior to discharging into any existing waterways. The erosion control plan will be broken into a multi-phased approach with initial erosion control measures, mid stage control measures, and final stage stabilization. Throughout the length of the project, numerous erosion control measures will be used, such as sediment basins, inlet protection, silt fence, construction entrances, and short-term vegetated stabilization. Final stage stabilization will include establishing vegetative cover, final cleaning of the proposed systems, as-built documentation, and close out of project.

The stormwater management approach for this project will include both conventional and green stormwater strategies and devices. The conventional infrastructure will be comprised of a reinforced pipe drainage network which collects overland sheet flow & shallow concentrated flow. Overland sheet flow will be utilized where possible prior to entering the sewer network, thereby taking advantage of any infiltrative properties of the soil. Underground stormwater control measures will be located at the low points of the site and locations most suitable to capture runoff. Stormwater control measures will meet local requirements for sediment removal, nutrient removal, and runoff detention. It’s anticipated that site runoff will match existing drainage patterns, discharging to the NE stream or Barbee Chapel r/w after treatment. In addition, the developer commits to using vegetated swales along Barbee Chapel Road and pervious pavers as enhanced landscaping features that reduce and/or slow water runoff from the site. The developer also plans to provide electric vehicle (EV) charging for 5% of the total number of parking spaces provided.

November 16, 2022

Judy Johnson
Town of Chapel Hill Planning Department
405 Martin Luther King Jr Boulevard
Chapel Hill, North Carolina 27514

RE: Barbee Chapel Apartments Justification and Statements of Compliance

STATEMENT OF JUSTIFICATION

The proposed zoning brings the subject parcels into greater conformance with the Town's Comprehensive Plan. The property is currently zoned R-2, and R-6 zoning is requested to fulfill the themes and goals of the comprehensive plan elaborated on below. Falling within the 54 Corridor Focus Area, Sub-Area A specifically calls for multifamily residential, which the current zoning district does not allow. Statements below further support the case for the requested R-6 zoning district to permit a multifamily and townhome development.

STATEMENT OF COMPLIANCE WITH COMPREHENSIVE PLAN

Toll Brothers Apartment Living is proposing a multi-family development on Barbee Chapel Road in accordance with the CH2020 Comprehensive Plan. The proposed plan addresses the following themes with their corresponding goals: A Place for Everyone, Community Prosperity and Engagement, Getting Around, Good Places, New Spaces, Nurturing our Community, and Town and Gown Collaboration. Similarly, it meets the intent of the NC 54 Corridor Sub-Area A focus area of the Future Land Use Map.

THEME 1: A PLACE FOR EVERYONE

Barbee Chapel Apartments meets the following goals under Theme 1:

- A range of housing options for current and future residents
- Family-friendly, accessible exterior and interior places throughout the town for a variety of active uses

One of the goals of Theme 1 is to provide a range of housing options for current and future residents. This property is located within the 54 Corridor Focus Area, and the Future Land Use Map Update to Chapel Hill 2020 shows the sub areas of the corridor, calling out various land uses and densities. Sub Area A calls for multi-family residential, shops & offices, and commercial as primary land uses and townhouses, parks, and institutional land uses as secondary uses. This proposal fulfills each of these by providing a multi-family and townhome development, contributing to the range of housing types desired by the Town. Additionally, the project intends to have 10% affordable units at the 65% and 85% AMI levels evenly dispersed throughout the development.

THEME 2: COMMUNITY PROSPERITY AND ENGAGEMENT

Barbee Chapel Apartments meets the following goals under Theme 2:

- Promote a safe, vibrant, and connected community

A goal of Theme 2 is to promote a safe, vibrant, and connected community as well as foster success of local businesses. The proposed development is situated between various other residential communities, providing a safe retreat for residents. The site is also near Meadowmont Village and Falconbridge Center, which provides residents with a variety of options to support local business restaurants, retail, and services. The site is also just up the street from The Farm, a recreation center for faculty, staff, and alumni of UNC-Chapel Hill. Overall, this residential development will contribute to a community that is well connected.

THEME 3: GETTING AROUND

Barbee Chapel Apartments meets the following goals under Theme 3:

- A connected community that links neighborhoods, businesses, and schools through the provision of greenways, sidewalks, bike facilities, and public transportation
- Connect to a regional transportation system
- Create a comprehensive transportation system that provides everybody safe and reasonable access to all the community offers

The proposed project will be well connected to adjacent neighborhoods and a commercial node across Hwy 54, within a mile of the property. Significant effort is made to prioritize pedestrian and bicycle movement within the project and to create connections to the nearby transit corridor. Indeed, this location is a five-minute walk to regional bus lines (GoTriangle) on NC-54 that serve both the university and employers in Durham County (notably Southpoint and RTP) and a 10-minute walk (0.4 miles or 2,112 feet) along public sidewalks to the town's high-frequency bus service to UNC at the Friday Center. Unless otherwise prohibited, residents likely will use existing private sidewalks along Finley Forest Drive to reach buses at the Friday Center in ten minutes or less. Combined, the two bus systems provide bus service to the UNC Campus and UNC Hospital at less-than-five-minute intervals during peak travel times, as well as bus service on nights and weekends, a rarity in this region. The developer proposes a multi-modal greenway along Barbee Chapel Road along the full length of its property line, further extending the multi-modal network for access to goods and services at Meadowmont Village. Whether it is a moderate walk, a bike ride, a short drive, or hopping on the bus, future residents of the proposed multi-family project will have multiple transportation options to choose from to access nearby retail, businesses, and services. A new traffic impact study will be completed to help guide the development design to minimize traffic impacts and not subtract from the quality of life of existing neighbors and future residents.

THEME 4: GOOD PLACES, NEW SPACES

Barbee Chapel Apartments meets the following goals under Theme 4:

- Future land-use, form, and density that strengthen the community, social equity, economic prosperity, and natural environment
- A range of neighborhood types that addresses residential, commercial, social, and cultural needs and uses while building and evolving Chapel Hill's character for residents, visitors, and students
- Open and accessible common spaces for community gathering, cultural uses, and community development

The proposed development provides new housing options to the 54 Corridor and will be consistent with the future land use plans for the area. Apartments and townhomes will provide the desired density to this area while maintaining the residential feel of neighboring communities and creating a new vibrant space for Chapel Hill residents. The site design will include multiple plaza and courtyard spaces, an amenity with a clubhouse and pool, and a dog park, offering multiple opportunities for community gathering. Green spaces will be organized along the main street through the development and will offer a connection point for the adjacent property to facilitate the creation of one "place" rather than individual projects.

THEME 5: NURTURING OUR COMMUNITY

Barbee Chapel Apartments meets the following goals under Theme 5:

- Maintain and improve air quality and water quality, and manage stormwater to heal local waterways and conserve biological ecosystems within the town boundaries and the Extra-Territorial Jurisdiction
- Support the Parks and Recreation Master Plan and the Greenways Master Plan to provide recreation opportunities and ensure safe pedestrian and bicycle connections

There is a very small portion of a stream buffer located in the northeast corner of the site that will be taken into consideration in the development of the property. Proximity to commercial nodes, bus stops, and trails supports the Climate Action Plan, by promoting walking and biking or public transportation to reduce vehicle use and emissions, therefore reducing carbon footprint and improving air quality. Stormwater will be detained and treated onsite with an underground facility and green stormwater infrastructure, ensuring that adjacent neighborhoods are not impacted from development. At minimum, the developer commits to using vegetated swales along Barbee Chapel Road and pervious pavers and raingardens within the site as part of its stormwater management strategy.

THEME 6: TOWN AND GOWN COLLABORATION

Barbee Chapel Apartments meets the following goals under Theme 6:

- Promote access for all residents to healthcare centers, public services, and active lifestyle opportunities
- Housing for students that is safe, sound, affordable, and accessible and meets a demonstrated need conducive to educational and maturational needs of students, and **housing for Town, University, and Healthcare System employees that encourages them to reside in the community**

By contributing to the range of housing options, this development will provide residents of varying ages, including recent UNC graduates and employees, with new rental housing opportunities. The proposed project is less than 5 miles from UNC campus and UNC Hospitals and approximately a 10-minute walk to a UNC Park and Ride lot. Additionally, there are multiple UNC medical offices even closer in Meadowmont, at the corner of Fordham Blvd and Manning Dr, and at the intersection of Hwy 54 and I-40. Recent graduates whose employment is outside of Chapel Hill will also find appeal here due to its affordability and proximity to the Durham and RTP job cores, allowing Chapel Hill to diversify its population as students turn into young professionals.

STATEMENT OF COMPLIANCE WITH DESIGN GUIDELINES

Toll Brothers Apartment Living multi-family project will be built in compliance with the Town's Design Guidelines.

The architecture will be carefully designed with high-quality materials and a design that fits within the overall community. Apartment buildings have been designed to create central courtyard amenity spaces for residents, that will serve as the community and social hubs for the project. Parking will be a combination of surface and structured tabletop to keep the costs of the project lower helping with affordability and will be evenly dispersed throughout the project.

Landscape buffers will be designed in accordance with the Town's design manual and with the use of best practices to provide appropriate transitions between the building and streetscapes and adjacent land uses.

Vehicular connectivity will be provided to Barbee Chapel Rd and future development to the east, and internal roadways will avoid dead-end streets. Pedestrian connections will be provided throughout the project.

Stormwater management facilities, water, sewer, and other utilities will be provided in accordance with the applicable guidelines, standards, and regulations.

Sincerely,

MCADAMS

Jessie Hardesty

Jessie Hardesty
Planner II, Planning + Design

2905 Meridian Parkway, Durham, NC 27713 / 919. 361. 5000

CONDITIONAL ZONING APPLICATION

TOWN OF CHAPEL HILL
Planning Department
405 Martin Luther King Jr. Blvd.
(919) 968-2728 *fax* (919) 969-2014
www.townofchapelhill.org

Parcel Identifier Number (PIN): 9798-72-97-2169 (multiple parcels included, see cover sheet) Date: 09/29/2022

Section A: Project Information

Project Name: Barbee Chapel Apartments

Property Address: 5101 Barbee Chapel Rd Zip Code: 27517

Use Groups (A, B, and/or C): A Existing Zoning District: R-2

Project Description: Residential development including townhomes and multifamily buildings

Section B: Applicant, Owner, and/or Contract Purchaser Information

Applicant Information (to whom correspondence will be mailed):

Name: McAdams - Spencer Christiansen

Address: 2905 Meridian Pkwy

City: Durham State: NC Zip Code: 27713

Phone: 919-287-0722 Email: christiansen@mcadamsco.com

The undersigned applicant hereby certifies that, to the best of their knowledge and belief, all information supplied with this application and accurate.

Signature: Spencer Christiansen Date: 9/29/2022

Owner/Contract Purchaser Information:

☐ **Owner** ☒ **Contract Purchaser**

Name: Toll Brothers Apartment Living - Michael Skena

Address: 900 Perimeter Park Dr, Suite B3

City: Morrisville State: NC Zip Code: 27560

Phone: 202-577-6491 Email: mskena@tollbrothers.com

The undersigned applicant hereby certifies that, to the best of their knowledge and belief, all information supplied with this application and accurate.

Signature: Date: 9/29/2022

Click here for application submittal instructions.

Conditional Rezoning applications are reviewed by staff, Planning Commission, and Town Council. The application is part of an open public process that enables Town Council to discuss and decide on the key issues of a rezoning proposal. If a rezoning is approved, the applicant may then submit a detailed final plan application to staff for compliance review with the technical development standards and with the Council rezoning approval.

The establishment of a Conditional Zoning District shall be consistent with the Land Use Plan in the Comprehensive Plan. A proposed Conditional Zoning District is deemed consistent if the proposed District will be located in conformance with an adopted small area plan and/or in one of the following Land Use Categories:

- Medium Residential
- High Residential
- Commercial
- Mixed Use, Office/Commercial Emphasis
- Mixed Use, Office Emphasis
- Town/Village Center
- Institutional
- Office
- University
- Development Opportunity Area
- Light Industrial Opportunity Area

If the proposed conditional zoning districts is located in a Low Residential or a Rural Residential Land Use Category, the Town Council must approve a Land Use Plan amendment prior to proceeding.

SIGNED CONDITIONS: All conditions shall be in writing, prepared by the owner of the property or an attorney and must be signed by all property owners and contract purchasers, if applicable. The Town Attorney may require additional signatures if necessary and will determine whether or not the conditions statement is legally sufficient. Within thirty (30) days after receipt of the conditions the Planning Division Manager will notify the applicant of any deficiencies in the conditions statement or if any additional information is needed. The applicant may make changes to the written conditions statement provided it is submitted at least thirty (30) prior to Planning Commission meeting or thirty (30) days prior to Town Council public hearing.

RECORDATION OF CONDITIONS: After a rezoning has been approved by the Town Council, the conditions statement shall be recorded with the Register of Deeds Office. After a rezoning has been approved by Town Council and recorded by the Register of Deeds Office, the conditions may not be amended except through a new rezoning application.

Section A: Project Information

Use Type: *(check/list all that apply)*

☐ Office/Institutional ☒ Residential ☐ Mixed-Use ☐ Other: _____

Overlay District: *(check all that apply)*

☐ Historic District ☐ Neighborhood Conservation District ☐ Airport Hazard Zone

Section B: Land Area

Net Land Area (NLA): Area within zoning lot boundaries		NLA=	455,841	sq. ft.
Choose one, or both, of the following (a or b), not to exceed 10% of NLA	a) Credited Street Area (total adjacent frontage) x ½ width of public right-of-way	CSA=	45,584	sq. ft.
	b) Credited Permanent Open Space (total adjacent frontage) x ½ public or dedicated open space	COS=		sq. ft.
TOTAL: NLA + CSA and/or COS = Gross Land Area (not to exceed NLA + 10%)		GLA=	501,425	sq. ft.

Section C: Special Protection Areas, Land Disturbance, and Impervious Area

Special Protection Areas: *(check all those that apply)*

☒ Jordan Buffer ☒ Resource Conservation District ☐ 100 Year Floodplain ☐ Watershed Protection District

Land Disturbance	**Total (sq. ft.)**
Area of Land Disturbance (Includes: Footprint of proposed activity plus work area envelope, staging area for materials, access/equipment paths, and all grading, including off-site clearing)	470,000
Area of Land Disturbance within RCD	0
Area of Land Disturbance within Jordan Buffer	2,200

Impervious Areas	**Existing (sq. ft.)**	**Demolition (sq. ft.)**	**Proposed (sq. ft.)**	**Total (sq. ft.)**
Impervious Surface Area (ISA)	73,616	73,616	350,998	350,998
Impervious Surface Ratio: Percent Impervious Surface Area of Gross Land Area (ISA/GLA)%	14.7%	14.7%	70% max	70% max
If located in Watershed Protection District, % of impervious surface on 7/1/1993	n/a	n/a	n/a	n/a

Section D: Dimensions

Dimensional Unit (sq. ft.)	Existing (sq. ft.)	Demolition (sq. ft.)	Proposed (sq. ft.)	Total (sq. ft.)
Number of Buildings	18	18	8	8
Number of Floors	1-2	1-2	5	5
Recreational Space	n/a	n/a	25,071 sf	25,071 sf

Residential Space				
Dimensional Unit (sq. ft.)	**Existing (sq. ft.)**	**Demolition (sq. ft.)**	**Proposed (sq. ft.)**	**Total (sq. ft.)**
Floor Area (all floors – heated and unheated)	23,500	23,500	476,360	476,360
Total Square Footage of All Units	0	0	360,300	360,300
Total Square Footage of Affordable Units	0	0	tbd	tbd
Total Residential Density	0	0	33 du/ac	33 du/ac
Number of Dwelling Units	0	0	370	370
Number of Affordable Dwelling Units	0	0	tbd	tbd
Number of Single Bedroom Units	0	0	220	220
Number of Two Bedroom Units	0	0	107	107
Number of Three Bedroom Units	0	0	40	40

Non-Residential Space *(Gross Floor Area in Square Feet)*					
Use Type	**Existing**	**Proposed**	**Uses**	**Existing**	**Proposed**
Commercial	0	0			
Restaurant	0	0	**# of Seats**	0	0
Government	0	0			
Institutional	0	0			
Medical	0	0			
Office	0	0			
Hotel	0	0	**# of Rooms**	0	0
Industrial	0	0			
Place of Worship	0	0	**# of Seats**	0	0
Other	0	0			

Dimensional Requirements		Required by Ordinance	Existing	Proposed
Setbacks (minimum)	Street	20'	n/a	20'
	Interior (neighboring property lines)	10'	n/a	10'
	Solar (northern property line)	8'	n/a	8
Height (maximum)	Primary	n/a	2 stories	5 stories
	Secondary	n/a	2 stories	5 stories
Streets	Frontages	15'	~660 feet	~660 feet
	Widths	15'	n/a	15'

Section F: Adjoining or Connecting Streets and Sidewalks

Note: For approval of proposed street names, contact the Engineering Department.

Street Name	Right-of-Way Width	Pavement Width	Number of Lanes	Existing Sidewalk*	Existing Curb/Gutter
Barbee Chapel Rd	varies	varies	2	☐ Yes	☐ Yes
				☐ Yes	☐ Yes

List Proposed Points of Access (Ex: Number, Street Name):

*If existing sidewalks do not exist and the applicant is adding sidewalks, please provide the following information:

Sidewalk Information			
Street Names	**Dimensions**	**Surface**	**Handicapped Ramps**
Barbee Chapel	10'	Concrete	☒ Yes ☐ No ☐ N/A
			☐ Yes ☐ No ☐ N/A

Section G: Parking Information

Parking Spaces	Minimum	Maximum	Proposed
Regular Spaces	381	490	482
Handicap Spaces	8	n/a	8
Total Spaces	389	n/a	490
Loading Spaces	n/a	n/a	0
Bicycle Spaces	84	n/a	84
Surface Type	asphalt		

Section H: Landscape Buffers

Location (North, South, Street, Etc.)	Minimum Width	Proposed Width	Alternate Buffer	Modify Buffer
North (adjacent to NC zoning)	20' Type C	10' Modified	☒ Yes	☒ Yes
South	10' Type B	4'-10' Modified	☒ Yes	☒ Yes
East	10' Type B	10' Modified	☒ Yes	☒ Yes
West (Barbee Chapel)	20' Type C	10-15' Modified	☒ Yes	☒ Yes

Section I: Land Use Intensity

Existing Zoning District:
Proposed Zoning Change *(if any)*:

Zoning – Area – Ratio			Impervious Surface Thresholds			Minimum and Maximum Limitations	
Zoning District(s)	**Floor Area Ratio (FAR)**	**Recreation Space Ratio (RSR)**	**Low Density Residential (0.24)**	**High Density Residential (0.50)**	**Non-Residential (0.70)**	**Maximum Floor Area (MFA) = FAR x GLA**	**Minimum Recreation Space (MSR) = RSR x GLA**
R-6	.303	0.05			0.70	151,931	25,072
TOTAL							
RCD Streamside		0.01					
RCD Managed		0.019					
RCD Upland							

Section J: Utility Service

Check all that apply:

Water	☒ OWASA	☐ Individual Well	☐ Community Well	☐ Other
Sewer	☒ OWASA	☐ Individual Septic Tank	☐ Community Package Plant	☐ Other
Electrical	☒ Underground	☐ Above Ground		
Telephone	☒ Underground	☐ Above Ground		
Solid Waste	☐ Town	☒ Private		

CONDITIONAL ZONING APPLICATION
SUBMITTAL REQUIREMENTS
TOWN OF CHAPEL HILL
Planning Department

The following must accompany your application. Failure to do so will result in your application being considered incomplete. For assistance with this application, please contact the Chapel Hill Planning Department (Planning) at (919) 968-2728 or at planning@townofchapelhill.org.

X	**Application fee** (including Engineering Review fee) (refer to fee schedule)	Amount Paid $
X	**Pre-application meeting** –with appropriate staff	
X	**Digital Files –** provide digital files of all plans and documents	
X	**Recorded Plat or Deed of Property**	
X	**Project Fact Sheet**	
TBD	**Traffic Impact Statement** – completed by Town's consultant (or exemption)	
N/A	**Description of Public Art Proposal,** if applicable	
X	**Statement of Justification**	
X	**Response to Community Design Commission and Town Council Concept Plan comments, if applicable**	
X	**Affordable Housing Proposal, if applicable**	
X	**Statement of Consistency with Comprehensive Plan or request to amend Comprehensive Plan**	
X	**Mailing list of owners of property within 1,000 feet perimeter of subject property** (see GIS notification tool)	
X	**Mailing fee for above mailing list (mailing fee is double due to 2 mailings)**	Amount Paid $
X	**Written Narrative describing the proposal, including proposed land uses and proposed conditions**	
X	**Resource Conservation District, Floodplain, & Jordan Buffers Determination** – necessary for all submittals	
x	**Jurisdictional Wetland Determination – if applicable**	
N/A	**Resource Conservation District Encroachment Exemption or Variance (determined by Planning)**	
N/A	**Jordan Buffer Authorization Certificate or Mitigation Plan Approval (determined by Planning)**	
N/A	**Reduced Site Plan Set (reduced to 8.5" x 11")**	

Stormwater Impact Statement (1 copy to be submitted)

a) Written narrative describing existing & proposed conditions, anticipated stormwater impacts and management structures and strategies to mitigate impacts
b) Description of land uses and area (in square footage)
c) Existing and proposed impervious surface area in square feet for all subareas and project area
d) Ground cover and uses information
e) Soil information (classification, infiltration rates, depth to groundwater and bedrock)
f) Time of concentration calculations and assumptions
g) Topography (2-foot contours)
h) Pertinent on-site and off-site drainage conditions
i) Upstream and/or downstream volumes
j) Discharges and velocities
k) Backwater elevations and effects on existing drainage conveyance facilities
l) Location of jurisdictional wetlands and regulatory FEMA Special Flood Hazard Areas
m) Water quality volume calculations
n) Drainage areas and sub-areas delineated
o) Peak discharge calculations and rates (1, 2, and 25-year storms)
p) Hydrographs for pre- & post-development without mitigation, post-development with mitigation
q) Volume calculations and documentation of retention for 2-year storm

r) 85% TSS removal for post-development stormwater runoff
s) Nutrient loading calculations
t) BMP sizing calculations
u) Pipe sizing calculations and schedule (include HGL & EGL calculations and profiles)

Plan Sets (10 copies to be submitted no larger than 24" x 36")

Plans should be legible and clearly drawn. All plan set sheets should include the following:

- Project Name
- Legend
- Labels
- North Arrow (North oriented toward top of page)
- Property boundaries with bearing and distances
- Scale (Engineering), denoted graphically and numerically
- Setbacks
- Streams, RCD Boundary, Jordan Riparian Buffer Boundary, Floodplain, and Wetlands Boundary, where applicable
- Revision dates and professional seals and signatures, as applicable

Cover Sheet

a) Include Project Name, Project fact information, PIN, and Design Team

Area Map

a) Project name, applicant, contact information, location, PIN, & legend
b) Dedicated open space, parks, greenways
c) Overlay Districts, if applicable
d) Property lines, zoning district boundaries, land uses, project names of site and surrounding properties, significant buildings, corporate limit lines
e) Existing roads (public & private), rights-of-way, sidewalks, driveways, vehicular parking areas, bicycle parking, handicapped parking, street names
f) 1,000' notification boundary

Existing Conditions Plan

a) Slopes, soils, environmental constraints, existing vegetation, and any existing land features
b) Location of all existing structures and uses
c) Existing property line and right-of-way lines
d) Existing utilities & easements including location & sizes of water, sewer, electrical, & drainage lines
e) Nearest fire hydrants
f) Nearest bus shelters and transit facilities
g) Existing topography at minimum 2-foot intervals and finished grade
h) Natural drainage features & water bodies, floodways, floodplain, RCD, Jordan Buffers & Watershed boundaries

Detailed Site Plan

a) Existing and proposed building locations
b) Description & analysis of adjacent land uses, roads, topography, soils, drainage patterns, environmental constraints, features, existing vegetation, vistas (on and off-site)
c) Location, arrangement, & dimension of vehicular parking, width of aisles and bays, angle of parking, number of spaces, handicapped parking, bicycle parking. Typical pavement sections & surface type.
d) Location of existing and proposed fire hydrants
e) Location and dimension of all vehicle entrances, exits, and drives
f) Dimensioned street cross-sections and rights-of-way widths
g) Pavement and curb & gutter construction details
h) Dimensioned sidewalk and tree lawn cross sections
i) Proposed transit improvements including bus pull-off and/or bus shelter
j) Required landscape buffers (or proposed alternate/modified buffers)
k) Required recreation area/space (including written statement of recreation plans)
l) Refuse collection facilities (existing and proposed) or shared dumpster agreement
m) Construction parking, staging, storage area, and construction trailer location
n) Sight distance triangles at intersections
o) Proposed location of street lights and underground utility lines and/or conduit lines to be installed
p) Easements
q) Clearing and construction limits
r) Traffic Calming Plan – detailed construction designs of devices proposed & associated sign & marking plan

Stormwater Management Plan

a) Topography (2-foot contours)
b) Existing drainage conditions
c) RCD and Jordan Riparian Buffer delineation and boundary (perennial & intermittent streams; note ephemeral streams on site)
d) Proposed drainage and stormwater conditions
e) Drainage conveyance system (piping)
f) Roof drains
g) Easements
h) BMP plans, dimensions, details, and cross-sections
i) Planting and stabilization plans and specifications

Landscape Protection Plan

a) Rare, specimen, and significant tree survey within 50 feet of construction area
b) Rare and specimen tree critical root zones
c) Rare and specimen trees proposed to be removed
d) Certified arborist tree evaluation, if applicable
e) Significant tree stand survey
f) Clearing limit line
g) Proposed tree protection/silt fence location
h) Pre-construction/demolition conference note
i) Landscape protection supervisor note
j) Existing and proposed tree canopy calculations, if applicable

Planting Plan

a) Dimensioned and labeled perimeter buffers
b) Off-site buffer easement, if applicable
c) Landscape buffer and parking lot planting plan (including planting strip between parking and building, entryway planting, and 35% shading requirement

Steep Slope Plan

a) Classify and quantify slopes 0-10%, 10-15%, 15-25%, and 25% and greater
b) Show and quantify areas of disturbance in each slope category
c) Provide/show specialized site design and construction techniques

Grading and Erosion Control Plan

a) Topography (2-foot contours)
b) Limits of Disturbance
c) Pertinent off-site drainage features
d) Existing and proposed impervious surface tallies

Streetscape Plan, if applicable

a) Public right-of-way existing conditions plan
b) Streetscape demolition plan
c) Streetscape proposed improvement plan
d) Streetscape proposed utility plan and details
e) Streetscape proposed pavement/sidewalk details
f) Streetscape proposed furnishing details
g) Streetscape proposed lighting detail

Solid Waste Plan

a) Preliminary Solid Waste Management Plan
b) Existing and proposed dumpster pads
c) Proposed dumpster pad layout design
d) Proposed heavy duty pavement locations and pavement construction detail
e) Preliminary shared dumpster agreement, if applicable

Construction Management Plan

a) Construction trailer location
b) Location of construction personnel parking and construction equipment parking
c) Location and size of staging and materials storage area
d) Description of emergency vehicle access to and around project site during construction
e) Delivery truck routes shown or noted on plan sheets

Energy Management Plan

a) Description of how project will be 20% more energy efficient than ASHRAE standards
b) Description of utilization of sustainable forms of energy (Solar, Wind, Hydroelectric, and Biofuels)
c) Participation in NC GreenPower program
d) Description of how project will ensure indoor air quality, adequate access to natural lighting, and allow for proposed utilization of sustainable energy
e) Description of how project will maintain commitment to energy efficiency and reduced carbon footprint over time
f) Description of how the project's Transportation Management Plan will support efforts to reduce energy consumption as it affects the community

Exterior Elevations

a) An outline of each elevation of the building, including the finished grade line along the foundation (height of building measured from mean natural grade)

February 21, 2023

Judy Johnson
Town of Chapel Hill Planning Department
405 Martin Luther King Jr Boulevard
Chapel Hill, North Carolina 27514

Re: Barbee Chapel Apartments Modifications to Regulations

Due to site constraints and peculiarities of the Land Use Management Ordinance, modifications to required standards are necessary to create a multi-family development that meets the Town's vision and intent for such developments. The requested modifications are necessary to allow for a cohesive and well-designed multi-family project that meets the goals and intent of the Chapel Hill Comprehensive Plan. To develop this land as multi-family project, modifications to density will be necessary which subsequently require modifications to floor area and building height. Modifications to buffers and setbacks will be required as well.

DENSITY

Permitted Density (maximum): 15 DU/AC
Proposed Density (maximum): 31 DU/AC

The Land Use Management Ordinance Article 3.8.2 sets forth density requirements for the Barbee Chapel Apartments development.

The R-6 zoning district is the densest residential district outside of Town Center districts, and the maximum density is capped at 15 du/ac. This would only allow for 156 apartment units on site. The subject site falls within the NC 54 Corridor Sub-Area A in Chapel Hill's Future Land Use Map. This area calls for multi-family residential use with a typical height of 6 stories for active street frontage. A multi-family project of that size and scale (6 stories, 3 buildings, and townhomes) would include over 156 units. Chapel Hill does not yet have an appropriate zoning district to allow for higher density projects where they are designated on the future land use map, outside of the Town Center areas. While zoning districts such as OI-3 or OI-4 exist that allow unlimited multi-family density, the project team was advised by Planning Staff to seek a zoning district that meets the intent of the land use and request a density modification. To meet the goals and intentions of the Future Land Use Map, a higher density allowance is necessary.

The applicant is proposing an increased density to 31 dwelling units per acre (based on gross land area) not to exceed 350 units.

FLOOR AREA RATIO

Permitted FAR (maximum): 0.303
Proposed FAR (maximum): 0.840

The Land Use Management Ordinance Article 3.8.2 sets forth floor area requirements for the Barbee Chapel Apartments development.

Under the proposed R-6 zoning district, the maximum floor area ratio is 0.303. This equates to roughly 151,931 square feet of allowed floor area. For reference, this is roughly equivalent to one of the buildings on the site. Meeting the requirement of a 0.303 floor area ratio at this site would warrant a low density, one- or two-story or single building development, not meeting the intent of the Comprehensive Plan.

The applicant is proposing an increased floor area ratio of 0.840 to allow for multiple 4-story and 5-story multi-family buildings and 24 townhomes.

BUILDING HEIGHT

Permitted Building Height (maximum): Setback 39'; Core 60'
Proposed Building Height (maximum): 60' feet or 5 stories

The Land Use Management Ordinance Article 3.8.2 sets forth building height requirements for the Barbee Chapel Apartments development.

Under the R-6 zoning district, the maximum building height at the setback is 39 feet and 60 feet at the core. Given the topography of the land and environmental features, it will be difficult to meet the 39-foot setback height along Barbee Chapel Rd. On the Future Land Use Map – Update to Chapel Hill 2020, this property falls under the NC 54 Corridor Sub-Area A, which calls for a Typical Height of 6 stories, Transitional Area Height of up to 4 stories, and Activated Street Frontage Height of 6 stories; This building will fall within those proposed ranges. Height per the LUMO is measured from mean finish grade to parapet.

The modification to the maximum building height will allow for the development of a more activated street frontage along Barbee Chapel Rd and encourage pedestrian activity in the corridor.

BUFFERS

LANDSCAPE BUFFER	REQUIRED TYPE	PROPOSED TYPE
NORTH (NC ZONE)	Type C- 20' Internal	6' Modified Buffer
SOUTH (HILLMONT)	Type B- 10' Internal	4'-10' Modified Buffer
EAST (HILLMONT)	Type B- 10' Internal	8'-10' Modified Buffer
WEST (BARBEE CHAPEL RD)	Type B- 20' External	10'-15' Modified Buffer

The Land Use Management Ordinance Article 5.6.6 sets forth buffer requirements for the Barbee Chapel Apartments development.

Buffer modifications are being requested for all the buffers required on the site. The required planting numbers cannot be met on the site to ensure that the trees and shrubs will survive and remain healthy. In lieu of trees, additional shrubs will be planted in the buffers. Existing buffers and landscaping adjacent to the North, East, and South sides of the property will provide extra screening and landscaping for the surrounding properties.

The applicant is requesting a modification for the western buffer along Barbee Chapel Rd. The required buffer of 20' would not create an activated streetscape or pedestrian and bicycle-friendly environment. The modified buffer would meet the intent of the Comprehensive Plan to create an activated street frontage. Similar to the South, East, and North buffers, the reduced plantings will ensure the health and survival of the trees.

SETBACKS

SETBACK	REQUIRED	PROPOSED
STREET	20’	20’
INTERIOR (NEIGHBORING PROPERTY LINES)	10’	8’
SOLAR (NORTHERN PROPERTY LINE)	8’	6’

The Land Use Management Ordinance Article 3.8.2 sets forth setback requirements for the Barbee Chapel Apartments development.

All residential structures (apartment buildings and townhomes) will fall within the required setbacks for the R-6 district, however a deviation is needed to allow for garages in some areas of the development. These structures are slightly longer than a traditional parking space and would encroach in the setbacks, therefore a reduction is requested.

CONCLUSION

In conclusion, the requested modifications remain in the spirit of the goals of Chapel Hill and align with the future land use of the Comprehensive Plan. As noted above, providing density on this site requires modifications to the R-6 zoning district, including increasing density allowance, increasing floor area ratio permitted, increasing building height permitted, reducing buffers, and reducing setbacks to further align with Chapel Hill’s goals.

Thank you for your consideration of these requested modifications for the R-6 zoning district as a part of the Barbee Chapel Apartments CZP application.

Sincerely,
MCADAMS

Jessie Hardesty

Jessie Hardesty
Planner III, Planning + Design

BARBEE CHAPEL APARTMENTS

March 10, 2023

VEHICULAR PARKING ANALYSIS

		UNIT COUNT					VEHICULAR PARKING REQUIRED BY CODE	
STRUCTURE	**UNIT TYPE**	**STUDIO**	**1BR**	**2BR**	**3BR**	**SUBTOTAL**	**MIN**	**MAX**
BUILDING 1	Apartment	9	135	19	10	173	188	236
BUILDING 2	Apartment	4	31	32	4	71	87	109
BUILDING 3	Apartment	8	23	43	0	74	91	114
BUILDING 4	Townhome				6	6	11	14
BUILDING 5	Townhome				6	6	11	14
BUILDING 6	Townhome				6	6	11	14
BUILDING 7	Townhome				6	6	11	14
	RESIDENTIAL TOTALS	**21**	**189**	**94**	**38**	**342**	**408**	**513**

PARKING PROVIDED

Surface Parking	431
Garages	16
Townhouse Parking	48
Subtotal	**495**

STORMWATER IMPACT ANALYSIS

Conditional Zoning Permit

Barbee Chapel Apartments/ TLA-22001/ February 2023

McAdams

BARBEE CHAPEL APARTMENTS

CHAPEL HILL, NORTH CAROLINA

STORMWATER IMPACT ANALYSIS

CONDITIONAL ZONING PERMIT

PROJECT NUMBER:	TLA-22001
DESIGNED BY:	M. TORRES, PE
	O. LEFEVRE, EI

DATE:	SEPTEMBER 2022
REVISED:	FEBRUARY 2023

MCADAMS

621 HILLSBOROUGH STREET, SUITE 500
RALEIGH, NC 27603
NC LIC. # C-0293

BARBEE CHAPEL APARTMENTS

Stormwater Impact Analysis

GENERAL DESCRIPTION

Barbee Chapel Apartments is a multi-family redevelopment at the intersection of Barbee Chapel Road and Pearl Lane in Chapel Hill, North Carolina. The approximately 10.5-acre site will consist of 344 multi-family units and 24 townhome units for a total of 368 units along with surface parking, a clubhouse, and amenity spaces. To meet the Town of Chapel Hill standards, two underground detention vaults with StormFilter systems are proposed.

The project site is located within the Jordan Lake Basin and is not in a watershed protection overlay. Stormwater runoff from the proposed development drains to both Morgan Creek and Little Creek. According to NC Division of Water Resources' NC Surface Water Classifications Map, Morgan Creek (Stream Index #16-41-2-(5.5) is classified as WS-IV;NSW and Little Creek (Stream Index #16-41-1-15-(0.5) is classified as WS-IV;NSW at this location. Per Town of Chapel Hill regulations, stormwater management on this site shall meet the stormwater management performance standards for development set forth in Appendix A, Article 5.4 of the Chapel Hill Code of Ordinances.

The regulations are as follows:

Chapel Hill Code of Ordinances, Article 5, Section 4.1 through 4.9

1. ***Applicability (5.4.2)***
    - ***a.*** *This section shall apply to all new development and redevelopment projects for which a zoning compliance permit is required.*
    - ***b.*** *To prevent the adverse impacts of stormwater runoff, the town has developed a set of performance standards that must be met at all new development and redevelopment sites. The following activities are exempt from these stormwater performance criteria:*
        - ***i.*** *Any logging and agricultural activity that is consistent with all federal, state and local regulations;*
        - ***ii.*** *Individual single-family and two-family development and redevelopments that do not disturb more than twenty thousand (20,000) square feet of land area, including cumulative disturbance since the adoption of the Land Use Management Ordinance on January 27, 2003, provided they are not part of a larger common plan of development.*
        - ***iii.*** *Repairs to any stormwater treatment facility deemed necessary by the town.*
        - ***iv.*** *For purposes of this section, "Larger common plan of development" shall be as defined in subsection 5.19.3(h) of this appendix and includes subdivisions that create four (4) or more residential lots.*
    - ***c.*** *Individual single-family and two-family residential construction that are exempt from stormwater performance criteria under subsection 5.4.2(b)(2) above shall discharge runoff in an non-erosive and diffuse manner using techniques approved by the town manager. Discharge system/techniques shall be in accordance with the standards established in the town's design manual.*

2. ***Design manual and Standard Details (5.4.3)***
    - ***a.*** *The town may furnish additional policy, criteria and information, for the proper implementation of the requirements of this section and may provide such information in the design manual and standard details, which manual may include a list of acceptable stormwater treatment practices, including the specific design criteria for each stormwater practice. The manual may be updated and expanded from time to time, at the discretion of the town, based on improvements in engineering, science, monitoring, and local maintenance experience. Stormwater treatment practices that are designed and constructed in accordance with these design and sizing criteria will be presumed to meet the minimum water quality performance standards.*

3. *General Performance Criteria for Stormwater Management (5.4.6)*
    a. *Stormwater treatment shall be designed to achieve average annual eighty-five (85) percent total suspended solids (TSS) removal and must apply to the volume of post-development runoff resulting from the first one-inch of precipitation. Alternative treatment methods to achieve eighty-five (85) percent average annual TSS removal may be acceptable. The eighty-five (85) percent requirement applies to eighty-five (85) percent of the additional suspended solids that are the result of the new development. (Ord. No. 2004-02-23/O-2)*
    b. *The stormwater runoff volume leaving the site post-development shall not exceed the stormwater runoff volume leaving the site pre-development (existing conditions) for the local 2-year frequency, 24-hour duration storm event for all development except single-family and two-family dwellings on lots existing as of January 27, 2003, or on lots pursuant to a preliminary plat that was approved by the town council prior to January 27, 2003. This may be achieved by hydrologic abstraction, recycling and/or reuse, or any other accepted scientific method.*
    c. *The stormwater runoff rate leaving the site post-development shall not exceed the stormwater runoff rate leaving the site pre-development (existing conditions) for the local 1-year, 2-year, and 25-year 24-hour storm events.*
    d. *Land disturbance within the stream channel of any ephemeral stream shall be minimized and prohibited unless explicitly authorized by issuance of a zoning compliance permit after demonstration of the necessity for the disturbance.*

This report contains the calculations detailing the expected stormwater impacts as a result of the proposed redevelopment, along with the design of the underground detention vaults and StormFilter systems that will be used to mitigate impacts. Please refer to the appropriate section of this report for additional information.

CALCULATION METHODOLOGY

- Rainfall data for this area in Chapel Hill, NC region is from the NOAA Atlas 14. This data contains a depth-duration-frequency (DDF) table describing rainfall depth versus time for varying return periods in the area. These rainfall depths are input into the meteorological model within PondPack for peak flow rate calculations. Please reference the precipitation information within the Miscellaneous Site Information section of this report for additional information.

- Using Web Soil Survey, the on-site soils were determined to be hydrological soil group (HSG) 'D' soils. Since the method chosen to compute pre- and post-development peak flow rates and runoff volumes is dependent upon the soil type, care was taken when selecting the appropriate Soil Conservation Service Curve Number (SCS CN).

- Land cover conditions for the pre-development condition were taken from survey performed by McAdams and best available GIS sources. Land cover conditions for the post-development condition were taken from the proposed layout.

- The time of concentration was calculated using SCS TR-55 (Segmental Approach, 1986). The Tc flow path can be divided into multiple segments where applicable: overland flow, concentrated flow, and channel flow. The travel time was then computed for each segment, from which the overall time of concentration was determined by taking the sum of each segmental time.

- Existing topographic information used in this analysis is from survey performed by McAdams.

- PondPack Version V8i was used in determined the pre- & post-development peak flow rates for the 1-, 2-, 10-, 25-, and 100-year storm events, as well as routing calculations for the proposed stormwater control measures.

- For reference only, as the site is located in the Jordan Watershed, total nitrogen and phosphorous export calculations were computed using the Stormwater Nitrogen and Phosphorous Tool v4.1.

DISCUSSION OF RESULTS

PEAK RUNOFF CONTROL REQUIREMENTS

The post-development peak flow for the 1-yr, 2-yr, and 25-yr storms is equal to or less than pre-development flow for the same storm at each POA. Please refer to the Summary of Results in this report.

2-YR VOLUME REDUCTION

The volume difference between the pre- and post- development 2-year runoff is detained to the maximum extent possible and treated entirely through the proposed StormFilter cartridges.

POLLUTANT AND NUTRIENT CONTROL REQUIREMENTS

The increase in impervious for the site meets the 85% TSS removal requirement through the proposed StormFilter systems. Nutrient treatment is not required for this development; water quality calculations are provided in the SNAP tool for reference only.

CONCLUSION

If the development on this tract is built as proposed within this report, then the requirements set forth in Town of Chapel Hill regulations will be met without additional stormwater control measures. However, modifications to the proposed development may require that this analysis be revised. Some modifications that would **require** this analysis to be revised include:

1. The proposed site impervious surface exceeds the amount accounted for in this report.
2. The post-development watershed breaks change significantly from those used to prepare this report.

The above modifications may result in the assumptions within this report becoming invalid. The computations within this report will need to be revisited if any of the above conditions become apparent as development of the proposed site moves forward.

1	SUMMARY OF RESULTS
2	MISCELLANEOUS SITE INFORMATION
3	PRE-DEVELOPMENT HYDROLOGIC CALCULATIONS
4	POST-DEVELOPMENT HYDROLOGIC CALCULATIONS
5	STORMWATER CONTROL MEASURE 'A' DESIGN CALCULATIONS
6	STORMWATER CONTROL MEASURE 'B' DESIGN CALCULATIONS
7	HYDROGRPAH PLOTS
8	NUTRIENT LOADING CALCULATIONS

SUMMARY OF RESULTS

BARBEE CHAPEL APARTMENTS

TLA-22001

SUMMARY OF RESULTS

RELEASE RATE MANAGEMENT RESULTS

POINT OF ANALYSIS #1			
Return Period	**Pre-Dev** [cfs]	**Post-Dev** [cfs]	**Difference** [cfs]
1-Year	8.39	7.12	-15%
2-Year	11.51	10.37	-10%
25-Year	21.98	20.35	-7%

POINT OF ANALYSIS #2			
Return Period	**Pre-Dev** [cfs]	**Post-Dev** [cfs]	**Difference** [cfs]
1-Year	2.80	0.62	-78%
2-Year	3.76	1.35	-64%
25-Year	6.86	4.99	-27%

POINT OF ANALYSIS #3			
Return Period	**Pre-Dev** [cfs]	**Post-Dev** [cfs]	**Difference** [cfs]
1-Year	3.54	0.54	-85%
2-Year	4.84	0.75	-85%
25-Year	9.11	1.42	-84%

POINT OF ANALYSIS #4			
Return Period	**Pre-Dev** [cfs]	**Post-Dev** [cfs]	**Difference** [cfs]
1-Year	0.56	0.08	-86%
2-Year	0.73	0.11	-85%
25-Year	1.26	0.22	-83%

SUMMARY OF RESULTS

PRE-DEVELOPMENT 2YR-24HR VOLUME SUMMARY

Total On-Site Area =	10.46	acres
Area Weighted On-site SCS CN =	81	
S =	2.30	
P (2-yr / 24-hour) =	3.56	inches
Q* =	1.78	inches
On-site Run-off Volume =	**1.55**	**acre-feet**
=	**67,660**	**cf**

POST-DEVELOPMENT 2YR-24HR VOLUME SUMMARY

Total On-Site Area =	10.46	acres
Area Weighted On-site SCS CN =	93	
S =	0.72	
P (2-yr / 24-hour) =	3.56	inches
Q* =	2.82	inches
Total On-site Run-off Volume =	**2.46**	**acre-feet**
=	**107,238**	**cf**

PRE TO POST-DEVELOPMENT 2YR-24HR VOLUME DIFFERENCE

Pre-Post 2yr Runoff Volume Difference =	**39,579**	**cf**

SUMMARY OF 2YR-24HR VOLUME CAPTURE

SCM A - Volume Captured =	7,700	cf
SCM B - Volume Captured =	41,400	cf
Total Pre-Post 2yr Runoff Volume Detained =	**49,100**	**cf**

SUMMARY OF RESULTS

STORMWATER CONTROL MEASURE A SUMMARY

Design Drainage Area =	2.71	ac
Design Impervious Area =	2.17	ac
% Impervious =	79.9%	
Top of Storage Vault Elev. =	288.00	ft
Bottom of Storage Vault Elev. =	282.75	ft
Vault Height =	5.25	ft
Vault Footprint =	2,800	sf
Total Available Volume =	14,700	cf
WQv =	5,680	cf
WQV Vol. Depth =	2.03	ft
WQV Vol. Elevation =	284.78	ft
Equiv. WQ Orifice =	1	
Orifice Invert Elevation =	282.75	ft
Orifice Diameter =	1.7	in
Weir Length =	4	ft
Weir Crest =	287.00	ft
Area Orifice 1 =	1	
Area Orifice Elevation =	285.50	ft
Orifice Area =	3'L x 0.5'H	ft^2
Stored Volume =	7,700	cf
Barrel Diameter =	24	in
# of Barrels =	1	
Upstream Invert =	282.25	ft
Downstream Invert =	281.30	ft
Length =	84	ft
Slope =	0.0113	ft/ft

STORMWATER CONTROL MEASURE ROUTING RESULTS

Return Period	Inflow [cfs]	Outflow [cfs]	Max. WSE [ft]	Freeboard [ft]
1-Year	10.74	5.00	286.21	1.79
2-Year	13.03	7.11	286.69	1.31
10-Year	17.28	12.04	287.37	0.63
25-Year	19.20	14.23	287.53	0.47
100-year	21.80	17.41	287.72	0.28

SUMMARY OF RESULTS

STORMWATER CONTROL MEASURE B SUMMARY

Design Drainage Area =	6.22	ac
Design Impervious Area =	5.19	ac
% Impervious =	83.5%	
Top of Storage Vault Elev. =	291.00	ft
Bottom of Storage Vault Elev. =	281.50	ft
Vault Height =	9.50	ft
Vault Footprint =	9,200	sf
Total Available Volume =	87,400	cf
WQv =	13,573	cf
WQV Vol. Depth =	0.00	ft
WQV Vol. Elevation =	282.98	ft
Equiv. WQ Orifice =	1	
Orifice Invert Elevation =	281.50	ft
Orifice Diameter =	2.7	in
Weir Length =	15	ft
Weir Crest =	290.25	ft
Area Orifice 1 =	1	
Area Orifice Elevation =	286.0	ft
Orifice Area =	1'L x 0.5'H	ft^2
Stored Volume =	41,400	cf
Barrel Diameter =	24	in
# of Barrels =	1	
Upstream Invert =	281.00	ft
Downstream Invert =	279.00	ft
Length =	250	ft
Slope =	0.0080	ft/ft

STORMWATER CONTROL MEASURE ROUTING RESULTS

Return Period	Inflow [cfs]	Outflow [cfs]	Max. WSE [ft]	Freeboard [ft]
1-Year	25.40	0.39	285.79	5.21
2-Year	30.59	1.32	286.44	4.56
10-Year	40.16	3.85	288.22	2.78
25-Year	44.48	4.81	289.44	1.56
100-Year	50.35	13.72	290.57	0.43

MISCELLANEOUS SITE INFORMATION

N

0 200 400 800 Feet

1 inch = 400 feet

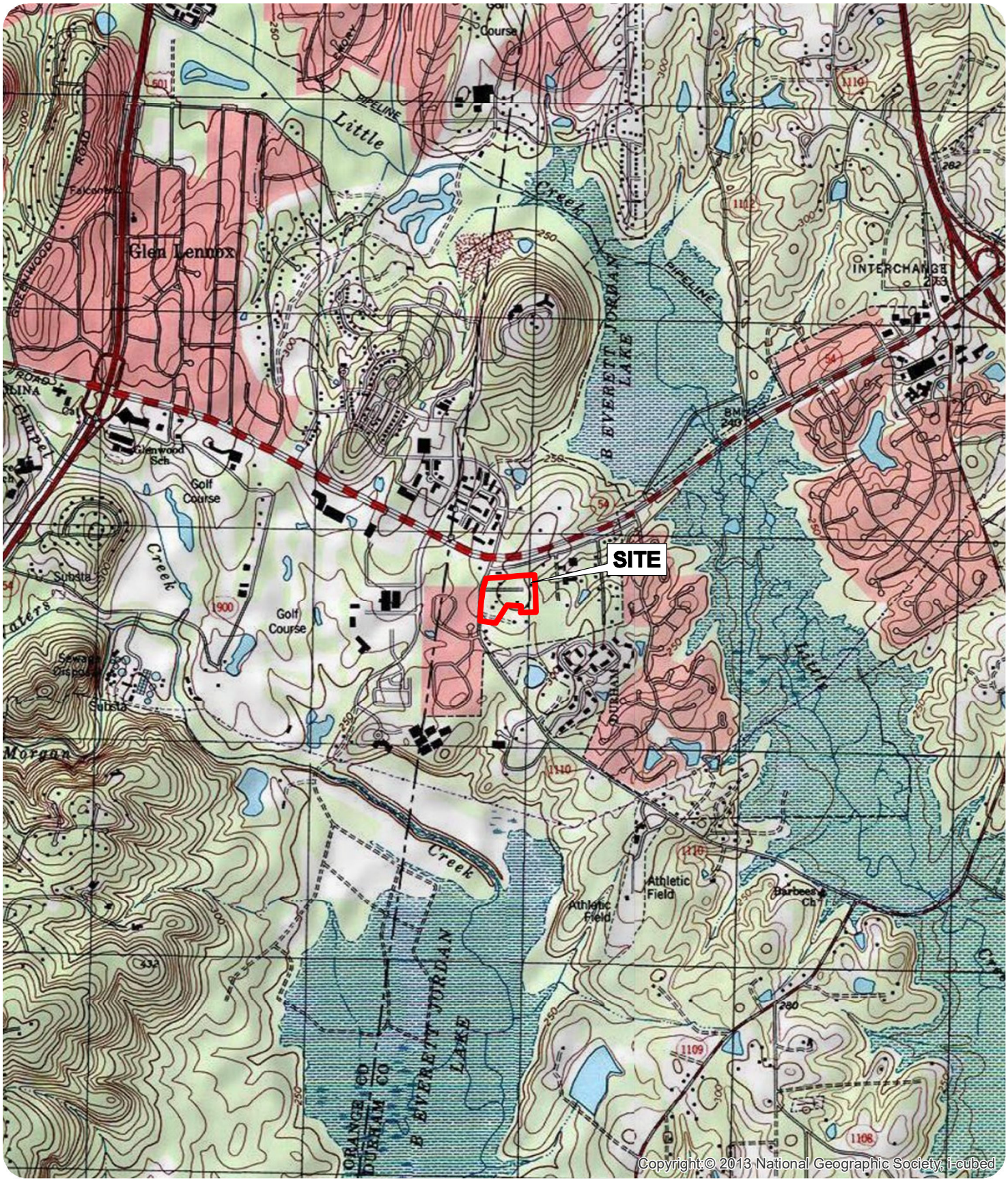
BARBEE CHAPEL APARTMENTS

SITE AERIAL MAP

PROJECT #: TLA-22001

CHAPEL HILL, NORTH CAROLINA

McADAMS



N

0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet

BARBEE CHAPEL

USGS TOPO MAP

PROJECT #: TLA-22001

CHAPEL HILL, NORTH CAROLINA

MCADAMS

Hydrologic Soil Group—Durham County, North Carolina
(XPL)

Map Scale: 1:1,890 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 25 50 100 150

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Durham County, North Carolina
Survey Area Data: Version 26, Jan 21, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 23, 2022—Apr 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
WsB	White Store sandy loam, 2 to 6 percent slopes	D	9.1	86.5%
WsC	White Store sandy loam, 6 to 10 percent slopes	D	1.4	13.5%
Totals for Area of Interest			**10.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

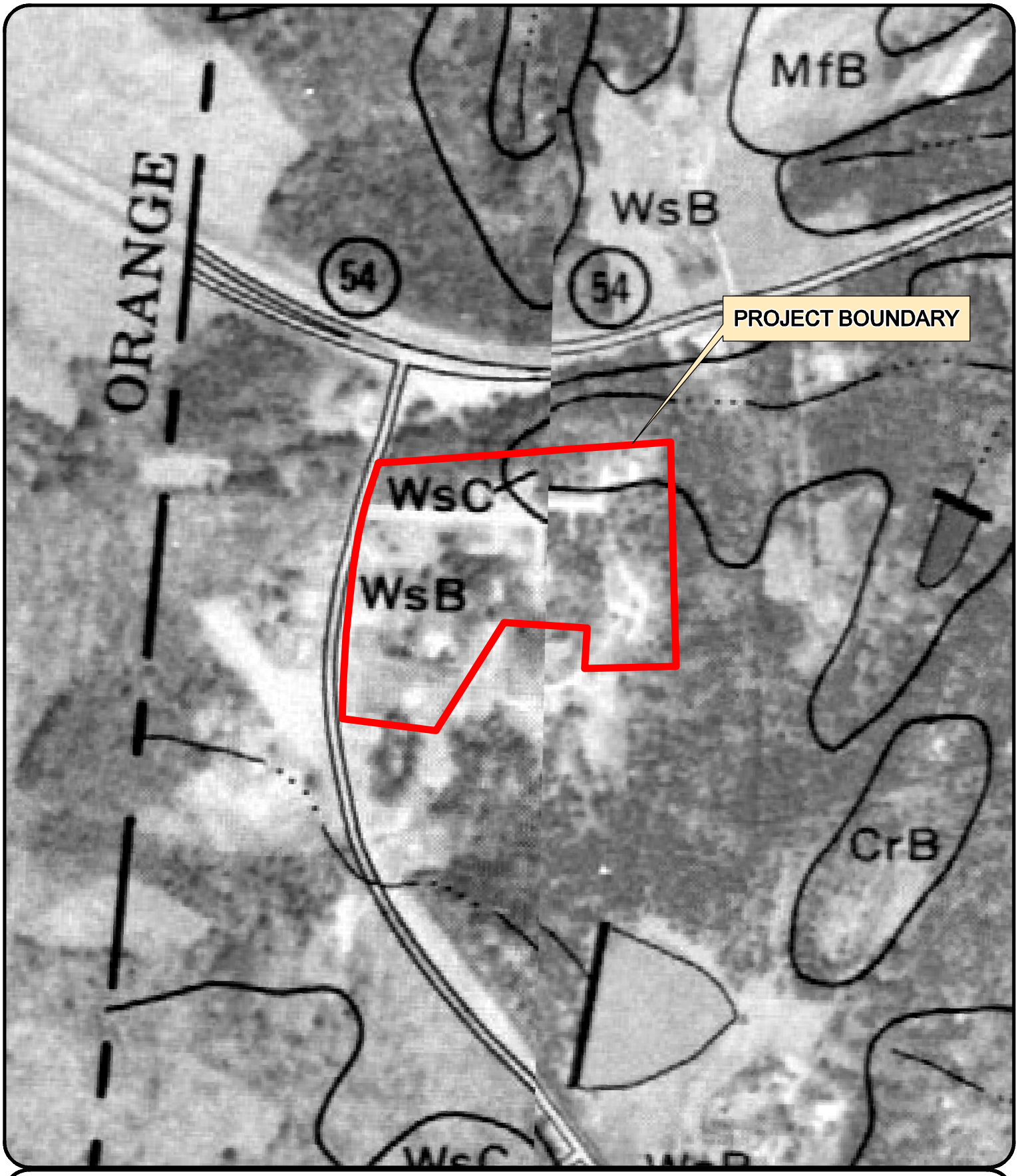
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



N

0 162.5 325 650 Feet

1 inch = 325 feet

BARBEE CHAPEL APARTMENTS

SOIL MAP

PROJECT #: TLA-22001

CHAPEL HILL, NORTH CAROLINA

McADAMS

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map flood hazard areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://FRIS.NC.GOV/FRIS

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A,V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with Average Depth Less Than One Foot or With Drainage Areas of Less Than One Square Mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*

OTHER AREAS
- Areas Determined to be Outside the 0.2% Annual Chance Floodplain *Zone X*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike, or Floodwall
- Non-accredited Levee, Dike, or Floodwall
- BM5510 North Carolina Geodetic Survey bench mark
- BM5510 National Geodetic Survey bench mark
- BM5510 Contractor Est. NCFMP Survey bench mark
- 012 18.2 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- 8 Coastal Transect
- Coastal Transect Baseline

OTHER FEATURES
- Profile Baseline
- Hydrographic Feature
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at http://www.ncfloodmaps.com, or contact the FEMA Map Service Center.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Flood Insurance Study (FIS) means an examination, evaluation, and determination of flood hazards, corresponding water surface elevations, flood hazard risk zones, and other flood data in a community issued by the North Carolina Floodplain Mapping Program (NCFMP). The Flood Insurance Study (FIS) is comprised of the following products used together: the Digital Flood Hazard Database, the Water Surface Elevation Rasters, the digitally derived, autogenerated Flood Insurance Rate Map and the Flood Insurance Survey Report. A Flood Insurance Survey is a compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community. This report contains detailed flood elevation data, data tables and FIRM indices. When a flood study is completed for the NFIP, the digital information, reports and maps are assembled into an FIS. Information shown on this FIRM is provided in digital format by the NCFMP. Base map information shown on this FIRM was provided in digital format by the NCFMP. The source of this information can be determined from the metadata available in the digital FLOOD database and in the Technical Support Data Notebook (TSDN).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee note appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a Provisionally Accredited Levee (PAL) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicates the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LiMWA (or between the shoreline and the LiMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

Limit of Moderate Wave Action (LiMWA)

COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE

This map may include approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for structures that are newly built or substantially improved on or after the date(s) indicated on the map. For more information see http://www.fws.gov/cbra, the FIS Report, or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-344-WILD.

CBRS Area Otherwise Protected Area

SCALE

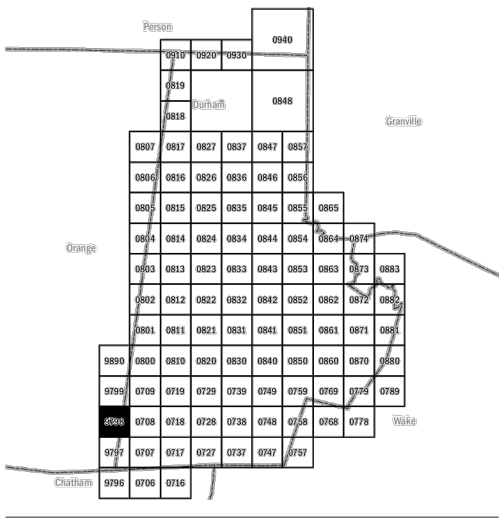
Map Projection:
North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

1 inch = 500 feet 1:6,000

0 250 500 1,000 Feet

0 75 150 300 Meters

PANEL LOCATOR



FEMA National Flood Insurance Program

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 9798

Panel Contains:

COMMUNITY	CID	PANEL	SUFFIX
CHAPEL HILL, TOWN OF	370180	9798	L
DURHAM COUNTY	370085	9798	L
DURHAM, CITY OF	370086	9798	L

VERSION NUMBER
2.3.3.2

MAP NUMBER
3710979800L

MAP REVISED
October 19, 2018

LOGO LOGO

Name of Stream	Description	Class	Class Date	Index No.
Neville Creek	From source to a point 0.5 mile upstream of mouth	WS-II;HQW,NSW	08/03/92	16-41-2-2-1-(1)
Neville Creek	From a point 0.5 mile upstream of mouth to Phils Creek	WS-II;HQW,NSW, CA	08/03/92	16-41-2-2-1-(2)
Pritchards Mill Creek (Mill Creek)	From source to a point 0.5 mile upstream of mouth	WS-II;HQW,NSW	08/03/92	16-41-2-3-(0.5)
Cumbo Creek	From source to Pritchards Mill Creek	WS-II;HQW,NSW	08/03/92	16-41-2-3-1
Pritchards Mill Creek (Mill Creek)	From a point 0.5 mile upstream of mouth to University Lake, Morgan Creek	WS-II;HQW,NSW, CA	08/03/92	16-41-2-3-(2)
Price Creek	From source to University Lake, Morgan Creek	WS-II;HQW,NSW, CA	08/03/92	16-41-2-4
East Branch Price Creek	From source to a point 0.2 mile upstream of mouth	WS-II;HQW,NSW	08/03/92	16-41-2-4-1-(1)
East Branch Price Creek	From a point 0.2 mile upstream of mouth to Price Creek	WS-II;HQW,NSW, CA	08/03/92	16-41-2-4-1-(2)
West Branch Price Creek	From source to a point 0.3 mile upstream of mouth	WS-II;HQW,NSW	08/03/92	16-41-2-4-2-(1)
West Branch Price Creek	From a point 0.3 mile upstream of mouth to Price Creek	WS-II;HQW,NSW, CA	08/03/92	16-41-2-4-2-(2)
Morgan Creek	From dam at University Lake to Orange County SR 1919	WS-V;NSW	08/11/09	16-41-2-(5)
Morgan Creek	From Orange County SR 1919 to Chatham County SR 1726 (Durham County SR 1109)	WS-IV;NSW	08/03/92	16-41-2-(5.5)
Wilson Creek	From source to Morgan Creek	WS-IV;NSW	08/03/92	16-41-2-6
Fan Branch	From source to Wilson Creek	WS-IV;NSW	08/03/92	16-41-2-6-1
Meeting of the Waters	From source to Morgan Creek	WS-IV;NSW	08/03/92	16-41-2-7
Chapel Creek	From source to Morgan Creek	WS-IV;NSW	08/03/92	16-41-2-8
Buck Branch	From source to Morgan Creek	WS-IV;NSW	08/03/92	16-41-2-9
Morgan Creek (including the Morgan Creek Arm of New Hope River Arm of B. Everett Jordan Lake)	From Chatham County SR 1726 (Durham County SR 1109) to New Hope Creek Arm of New Hope River Arm of B. Everett Jordan Lake	WS-IV;NSW,CA	08/03/92	16-41-2-(9.5)
Cub Creek	From source to a point 0.7 mile downstream of Chatham County SR 1008	WS-IV;NSW	08/03/92	16-41-2-10-(0.5)
Big Branch (Clearwater Lake)	From source to Cub Creek	WS-IV;NSW	08/03/92	16-41-2-10-1
Cub Creek	From a point 0.7 mile downstream of Chatham County SR 1008 to Morgan Creek Arm of New Hope River Arm of B. Everett Jordan Lake	WS-IV;NSW,CA	08/03/92	16-41-2-10-(2)
Lick Creek	From source to N.C. Hwy. 751	WS-IV;NSW	08/03/92	16-41-2.5-(1)
Lick Creek	From N.C. Hwy. 751 to New Hope River Arm of B. Everett Jordan Lake	WS-IV;NSW,CA	08/03/92	16-41-2.5-(2)
Folkner Branch	From source to a point 0.5 mile upstream of mouth	WS-IV;NSW	08/03/92	16-41-3-(1)
Folkner Branch	From a point 0.5 mile upstream of mouth to New Hope River Arm of B. Everett Jordan Lake	WS-IV;NSW,CA	08/03/92	16-41-3-(2)

Name of Stream	Description	Class	Class Date	Index No.
New Hope River Arm of B. Everett Jordan Lake (below normal pool elevation)	From source at confluence of Morgan Creek and New Hope Creek Arms of B. Everett Jordan Lake (a east-west line across the southern tip of the formed penisula) to Chatham County SR 1008	WS-IV,B;NSW,CA	08/03/92	16-41-(0.5)
New Hope Creek	From source to a point 0.3 mile upstream of Durham County SR 2220	WS-V;NSW	08/11/09	16-41-1-(0.5)
Long Branch	From source to New Hope Creek	WS-V;NSW	08/11/09	16-41-1-2
Garrett Branch	From source to New Hope Creek	WS-V;NSW	08/11/09	16-41-1-3
Steep Bottom Creek	From source to New Hope Creek	WS-V;NSW	08/11/09	16-41-1-4
Mountain Creek	From source to New Hope Creek	WS-V;NSW	08/11/09	16-41-1-5
Unnamed Tributary at Camp New Hope (Camp New Hope Lake)	From source to New Hope Creek	WS-V;NSW	08/11/09	16-41-1-6
Old Field Creek	From source to New Hope Creek	WS-V;NSW	08/11/09	16-41-1-7
Piney Mountain Creek (Little Creek)	From source to New Hope Creek	WS-V;NSW	08/11/09	16-41-1-8
Church Branch	From source to New Hope Creek	WS-V;NSW	08/11/09	16-41-1-9
Mud Creek	From source to New Hope Creek	WS-V;NSW	08/11/09	16-41-1-10
Sandy Creek	From source to New Hope Creek	WS-V;NSW	08/11/09	16-41-1-11
New Hope Creek	From a point 0.3 mile upstream of Durham County SR 2220 to a point 0.8 mile downstream of Durham County SR 1107	WS-IV;NSW	08/03/92	16-41-1-(11.5)
Third Fork Creek	From source to a point 2.0 miles upstream of N.C. Hwy. 54	WS-V;NSW	08/11/09	16-41-1-12-(1)
Third Fork Creek	From a point 2.0 miles upstream of N.C. Hwy. 54 to New Hope Creek	WS-IV;NSW	08/03/92	16-41-1-12-(2)
Gum Creek	From source to New Hope Creek	WS-IV;NSW	08/03/92	16-41-1-13
New Hope Creek (including New Hope Creek Arm of New Hope River Arm of B. Everett Jordan Lake)	From a point 0.8 mile downstream of Durham County SR 1107 to confluence with Morgan Creek Arm of New Hope River Arm of B. Everett Jordan Lake	WS-IV;NSW,CA	08/03/92	16-41-1-(14)
Little Creek	From source to a point 0.7 mile downstream of Durham County SR 1110	WS-IV;NSW	08/03/92	16-41-1-15-(0.5)
Bolin Creek (Hogan Lake)	From source to U.S. Hwy. 501 Business	WS-V;NSW	08/11/09	16-41-1-15-1-(0.5)
Jones Creek	From source to Bolin Creek	WS-V;NSW	08/11/09	16-41-1-15-1-1
Buckhorn Branch	From source to Jones Creek	WS-V;NSW	08/11/09	16-41-1-15-1-1-1
Jolly Branch	From source to Bolin Creek	WS-V;NSW	08/11/09	16-41-1-15-1-2
Tanbark Branch	From source to Bolin Creek	WS-V;NSW	08/11/09	16-41-1-15-1-3
Bolin Creek	From U.S. Hwy. 501 Business to Little Creek	WS-IV;NSW	08/03/92	16-41-1-15-1-(4)
Booker Creek (Eastwood Lake)	From source to dam at Eastwood Lake	WS-V,B;NSW	08/11/09	16-41-1-15-2-(1)
Crow Branch	From source to Booker Creek	B;NSW	12/01/83	16-41-1-15-2-2

NOAA Atlas 14, Volume 2, Version 3
Location name: Chapel Hill, North Carolina, USA*
Latitude: 35.9001°, Longitude: -79.0068°
Elevation: 302.86 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.409** (0.375-0.447)	**0.481** (0.441-0.525)	**0.552** (0.507-0.604)	**0.612** (0.560-0.667)	**0.672** (0.612-0.733)	**0.716** (0.650-0.780)	**0.755** (0.681-0.822)	**0.788** (0.707-0.859)	**0.823** (0.732-0.899)	**0.852** (0.751-0.932)
10-min	**0.654** (0.599-0.714)	**0.769** (0.705-0.840)	**0.884** (0.812-0.967)	**0.978** (0.895-1.07)	**1.07** (0.976-1.17)	**1.14** (1.03-1.24)	**1.20** (1.08-1.31)	**1.25** (1.12-1.36)	**1.30** (1.16-1.42)	**1.34** (1.18-1.47)
15-min	**0.817** (0.749-0.893)	**0.967** (0.887-1.06)	**1.12** (1.03-1.22)	**1.24** (1.13-1.35)	**1.36** (1.24-1.48)	**1.44** (1.31-1.57)	**1.52** (1.37-1.65)	**1.58** (1.41-1.72)	**1.64** (1.46-1.79)	**1.68** (1.48-1.84)
30-min	**1.12** (1.03-1.22)	**1.34** (1.23-1.46)	**1.59** (1.46-1.74)	**1.79** (1.64-1.96)	**2.01** (1.83-2.19)	**2.17** (1.97-2.37)	**2.32** (2.10-2.53)	**2.45** (2.20-2.68)	**2.61** (2.32-2.85)	**2.73** (2.40-2.98)
60-min	**1.40** (1.28-1.53)	**1.68** (1.54-1.83)	**2.04** (1.87-2.23)	**2.33** (2.14-2.55)	**2.68** (2.44-2.92)	**2.95** (2.67-3.21)	**3.20** (2.89-3.48)	**3.44** (3.09-3.75)	**3.74** (3.33-4.09)	**3.98** (3.51-4.35)
2-hr	**1.67** (1.52-1.83)	**2.00** (1.83-2.20)	**2.46** (2.25-2.70)	**2.84** (2.58-3.11)	**3.30** (2.99-3.61)	**3.68** (3.31-4.02)	**4.04** (3.61-4.42)	**4.40** (3.90-4.81)	**4.86** (4.28-5.32)	**5.25** (4.57-5.75)
3-hr	**1.77** (1.62-1.95)	**2.14** (1.96-2.34)	**2.63** (2.41-2.89)	**3.06** (2.79-3.34)	**3.58** (3.25-3.91)	**4.02** (3.63-4.39)	**4.45** (3.98-4.86)	**4.89** (4.34-5.34)	**5.48** (4.80-5.98)	**5.97** (5.18-6.55)
6-hr	**2.13** (1.96-2.33)	**2.57** (2.36-2.80)	**3.16** (2.90-3.45)	**3.68** (3.37-4.01)	**4.34** (3.95-4.72)	**4.89** (4.42-5.32)	**5.45** (4.88-5.92)	**6.02** (5.34-6.54)	**6.80** (5.94-7.39)	**7.47** (6.44-8.14)
12-hr	**2.52** (2.33-2.75)	**3.03** (2.80-3.31)	**3.76** (3.46-4.09)	**4.40** (4.03-4.78)	**5.24** (4.76-5.67)	**5.95** (5.37-6.43)	**6.68** (5.97-7.21)	**7.46** (6.58-8.03)	**8.52** (7.39-9.18)	**9.44** (8.06-10.2)
24-hr	**2.95** (2.76-3.15)	**3.56** (3.34-3.81)	**4.45** (4.17-4.75)	**5.15** (4.81-5.49)	**6.09** (5.67-6.51)	**6.83** (6.35-7.30)	**7.59** (7.03-8.13)	**8.37** (7.73-8.98)	**9.45** (8.68-10.2)	**10.3** (9.41-11.1)
2-day	**3.44** (3.22-3.68)	**4.15** (3.89-4.44)	**5.14** (4.82-5.50)	**5.91** (5.52-6.32)	**6.94** (6.46-7.43)	**7.76** (7.20-8.30)	**8.58** (7.94-9.20)	**9.43** (8.69-10.1)	**10.6** (9.70-11.4)	**11.5** (10.5-12.4)
3-day	**3.64** (3.41-3.90)	**4.38** (4.10-4.68)	**5.40** (5.06-5.78)	**6.20** (5.80-6.63)	**7.28** (6.78-7.79)	**8.13** (7.55-8.71)	**9.00** (8.32-9.65)	**9.89** (9.11-10.6)	**11.1** (10.2-12.0)	**12.1** (11.0-13.0)
4-day	**3.84** (3.60-4.11)	**4.61** (4.32-4.92)	**5.66** (5.31-6.05)	**6.49** (6.07-6.94)	**7.62** (7.10-8.15)	**8.51** (7.89-9.11)	**9.42** (8.71-10.1)	**10.3** (9.53-11.1)	**11.6** (10.6-12.5)	**12.6** (11.5-13.7)
7-day	**4.41** (4.16-4.70)	**5.26** (4.96-5.61)	**6.40** (6.02-6.82)	**7.29** (6.85-7.77)	**8.51** (7.97-9.07)	**9.47** (8.84-10.1)	**10.5** (9.73-11.2)	**11.5** (10.6-12.3)	**12.9** (11.8-13.8)	**13.9** (12.8-15.0)
10-day	**5.02** (4.74-5.34)	**5.96** (5.63-6.34)	**7.16** (6.75-7.61)	**8.10** (7.62-8.60)	**9.36** (8.78-9.96)	**10.4** (9.69-11.0)	**11.4** (10.6-12.1)	**12.4** (11.5-13.2)	**13.8** (12.7-14.7)	**14.9** (13.7-15.9)
20-day	**6.71** (6.33-7.11)	**7.91** (7.47-8.38)	**9.34** (8.82-9.89)	**10.5** (9.88-11.1)	**12.0** (11.3-12.7)	**13.2** (12.4-14.1)	**14.5** (13.5-15.4)	**15.7** (14.6-16.8)	**17.4** (16.1-18.6)	**18.7** (17.2-20.1)
30-day	**8.33** (7.89-8.82)	**9.80** (9.27-10.4)	**11.4** (10.8-12.0)	**12.6** (11.9-13.3)	**14.2** (13.4-15.1)	**15.5** (14.6-16.4)	**16.7** (15.7-17.7)	**18.0** (16.8-19.1)	**19.6** (18.3-20.9)	**20.9** (19.4-22.3)
45-day	**10.6** (10.1-11.2)	**12.4** (11.8-13.1)	**14.2** (13.5-14.9)	**15.6** (14.8-16.4)	**17.4** (16.5-18.3)	**18.8** (17.8-19.8)	**20.2** (19.0-21.3)	**21.5** (20.2-22.7)	**23.3** (21.8-24.6)	**24.6** (23.0-26.1)
60-day	**12.7** (12.2-13.4)	**14.8** (14.2-15.6)	**16.8** (16.0-17.6)	**18.2** (17.4-19.1)	**20.1** (19.1-21.1)	**21.5** (20.5-22.6)	**22.9** (21.7-24.1)	**24.3** (22.9-25.6)	**26.0** (24.5-27.4)	**27.3** (25.7-28.8)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

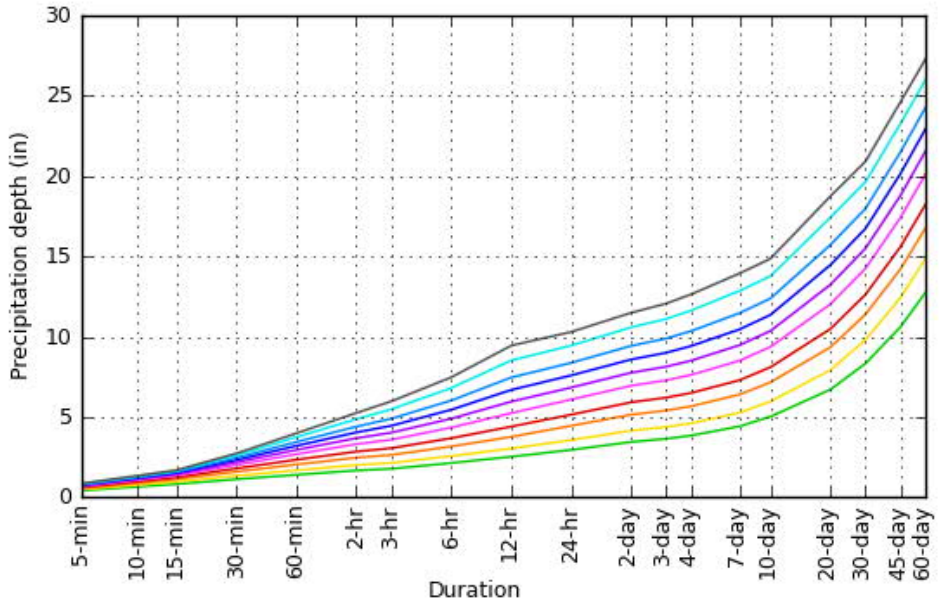
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

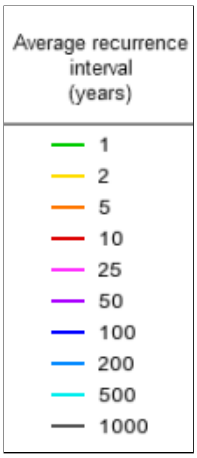
Please refer to NOAA Atlas 14 document for more information.

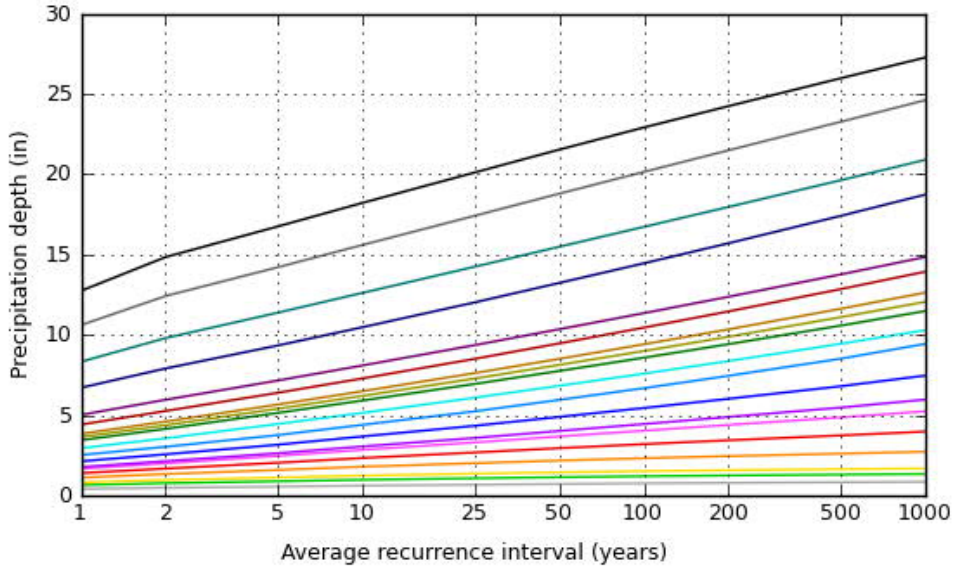
Back to Top

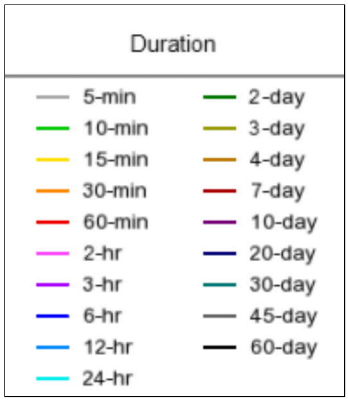
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 35.9001°, Longitude: -79.0068°









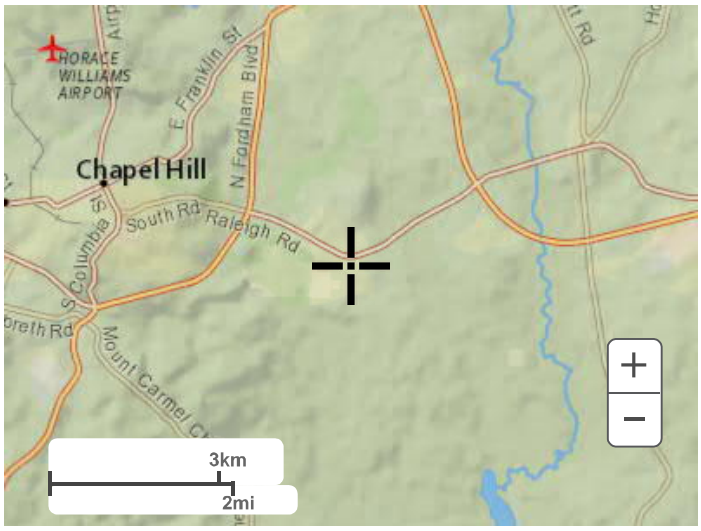
NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Fri Aug 26 14:57:38 2022

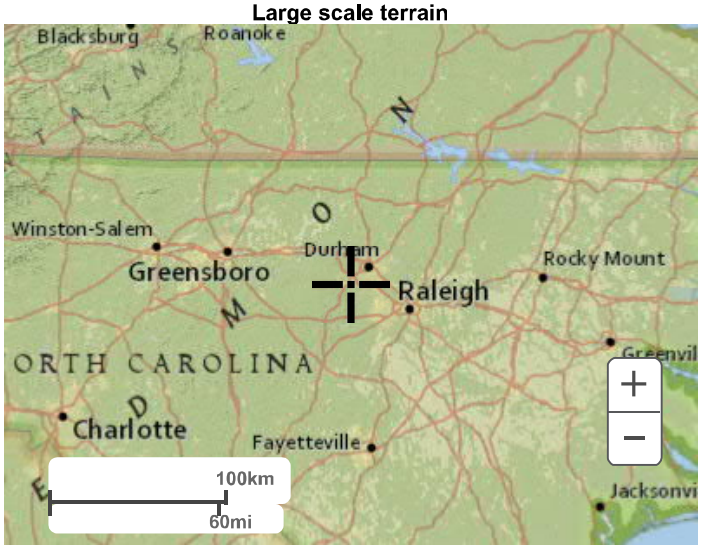
Back to Top

Maps & aerials

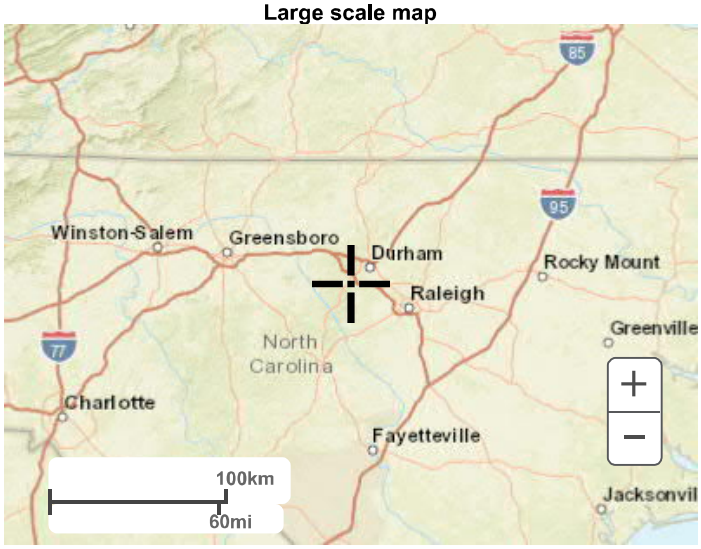
Small scale terrain



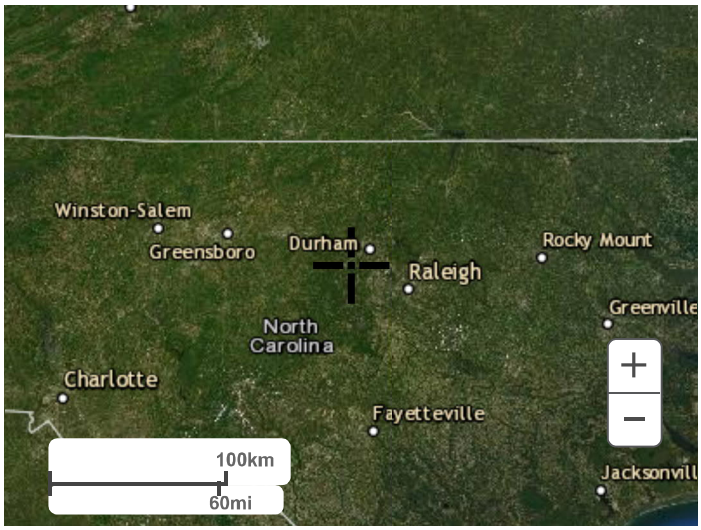
Large scale terrain



Large scale map



Large scale aerial



Back to Top

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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

PRE-DEVELOPMENT HYDROLOGIC CALCULATIONS

BARBEE CHAPEL APARTMENTS

TLA-22001

BARBEE CHAPEL APTS
TLA-22001

PRE-DEVELOPMENT HYDROLOGY
Summary of Results

O. LEFEVRE, EI
9/27/2022

HYDROLOGY INPUT SUMMARY

Sub-basin ID	Onsite Area [acres]					Offsite Area [acres]					Total Area [acres]	SCS CN	Tc [min]
	Impervious	Open	Wooded	Pond	Total	Impervious	Open	Wooded	Pond	Total			
1	0.91	1.69	3.57	0.00	6.17	0.00	0.14	0.00	0.00	0.14	6.32	81	18.52
2	0.35	0.88	0.48	0.00	1.71	0.00	0.00	0.00	0.00	0.00	1.71	83	15.33
3	0.33	0.56	1.42	0.00	2.31	0.00	0.00	0.00	0.00	0.00	2.31	81	14.11
4	0.10	0.14	0.03	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.27	86	12.81
Totals =	1.69	3.27	5.50	0.00	**10.46**	0.00	0.14	0.00	0.00	0.14	**10.61**		

NUTRIENT INPUT SUMMARY

****Jordan/Falls Lake Stormwater Nutrient Load Accounting Tool Inputs*

Land Use	Area (sf)	Area (ac)
Roadway Area	18,322	0.42
Driveway / Parking	28,204	0.65
Roof Area	24,391	0.56
Sidewalk / Patio	2,780	0.06
Open	142,541	3.27
Wooded	239,603	5.50
Pond	0	0.00
Total	**455,841**	**10.46**

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	14,204	0.33
Driveway / Parking Lot	9,251	0.21
Roof	13,872	0.32
Sidewalk / Patio	2,372	0.05
Other	0	0.00
Totals	39,699	0.91

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	39,699	0.91	-
Onsite open	80	73,713	1.69	Assume good condition
Onsite wooded	77	155,452	3.57	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	6,315	0.14	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	6.32	acres
	275,179	sf
Composite SCS CN =	81	
% Impervious =	14.4%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	306.50	ft
Bot Elev =	305.00	ft
Height =	1.5	ft
Slope =	0.0150	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.56	inches (Chapel Hill, NC)
Segment Time =	***15.16***	***minutes***

Segment 2: Concentrated Flow

Length =	538	ft
Top Elev =	305.00	ft
Bot Elev =	286.00	ft
Height =	19	ft
Slope =	0.0353	ft/ft
Paved ? =	No	
Velocity =	3.03	ft/sec
Segment Time =	***2.96***	***minutes***

Segment 3: Channel Flow

Length =	125	ft
Top Elev =	286.00	
Bot Elev =	284.00	
Height =	2	ft
Slope =	0.0160	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	15.00	sf (assume 5'w x 3'h channel)
Wetted Perimeter =	11.00	lf (assume 5' x 3' channel)
Channel Velocity =	5.15	ft/sec
Segment Time =	***0.40***	***minutes***

Time of Concentration =	18.52	minutes
SCS Lag Time =	11.11	minutes (SCS Lag = 0.6* Tc)
Time Increment =	3.22	minutes (= 0.29*SCS Lag)

PRE-DEVELOPMENT HYDROLOGY

Subbasin 2

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	2,943	0.07
Driveway / Parking Lot	7,520	0.17
Roof	4,807	0.11
Sidewalk / Patio	169	0.00
Other	0	0.00
Totals	15,439	0.35

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	15,439	0.35	-
Onsite open	80	38,342	0.88	Assume good condition
Onsite wooded	77	20,888	0.48	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	1.71	acres
	74,669	sf
Composite SCS CN =	83	
% Impervious =	20.7%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow			***Segment 2: Concentrated Flow***		
Length =	100	ft	Length =	367	ft
Top Elev =	306.50	ft	Top Elev =	304.50	ft
Bot Elev =	304.50	ft	Bot Elev =	288.50	ft
Height =	2	ft	Height =	16	ft
Slope =	0.0200	ft/ft	Slope =	0.0436	ft/ft
Manning's n =	0.24	dense grasses	Paved ? =	No	
P (2-year/24-hour) =	3.56	inches (Chapel Hill, NC)	Velocity =	3.37	ft/sec
Segment Time =	***13.51***	***minutes***	***Segment Time =***	***1.81***	***minutes***

Time of Concentration =	15.33	minutes
SCS Lag Time =	9.20	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.67	minutes (= 0.29*SCS Lag)

PRE-DEVELOPMENT HYDROLOGY

Subbasin 3

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	11,433	0.26
Roof	2,839	0.07
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	14,272	0.33

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	14,272	0.33	-
Onsite open	80	24,293	0.56	Assume good condition
Onsite wooded	77	61,869	1.42	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	2.31	acres
	100,434	sf
Composite SCS CN =	81	
% Impervious =	14.2%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow			***Segment 2: Concentrated Flow***		
Length =	100	ft	Length =	236	ft
Top Elev =	305.00	ft	Top Elev =	302.75	ft
Bot Elev =	302.75	ft	Bot Elev =	293.00	ft
Height =	2.25	ft	Height =	10	ft
Slope =	0.0225	ft/ft	Slope =	0.0413	ft/ft
Manning's n =	0.24	dense grasses	Paved ? =	No	
P (2-year/24-hour) =	3.56	inches (Chapel Hill, NC)	Velocity =	3.28	ft/sec
Segment Time =	***12.91***	***minutes***	***Segment Time =***	***1.20***	***minutes***

Time of Concentration =	14.11	minutes
SCS Lag Time =	8.46	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.45	minutes (= 0.29*SCS Lag)

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	1,175	0.03
Driveway / Parking Lot	0	0.00
Roof	2,873	0.07
Sidewalk / Patio	239	0.01
Other	0	0.00
Totals	4,287	0.10

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	4,287	0.10	-
Onsite open	80	6,198	0.14	Assume good condition
Onsite wooded	77	1,394	0.03	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	0.27	acres
	11,879	sf
Composite SCS CN =	86	
% Impervious =	36.1%	

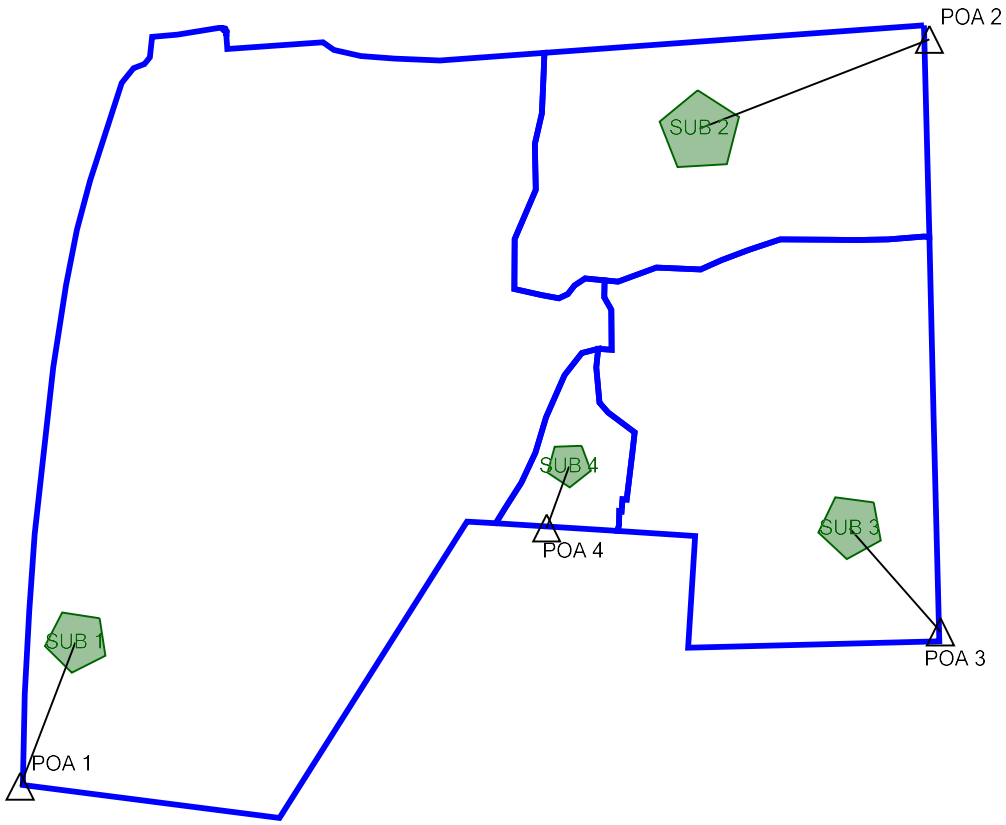
III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow			***Segment 2: Concentrated Flow***		
Length =	58	ft	Length =	115	ft
Top Elev =	306.00	ft	Top Elev =	305.50	ft
Bot Elev =	305.50	ft	Bot Elev =	301.50	ft
Height =	0.5	ft	Height =	4	ft
Slope =	0.0087	ft/ft	Slope =	0.0347	ft/ft
Manning's n =	0.24	dense grasses	Paved ? =	No	
P (2-year/24-hour) =	3.56	inches (Chapel Hill, NC)	Velocity =	3.01	ft/sec
Segment Time =	***12.18***	***minutes***	***Segment Time =***	***0.64***	***minutes***

Time of Concentration =	12.81	minutes
SCS Lag Time =	7.69	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.23	minutes (= 0.29*SCS Lag)

Scenario: Pre-Dev 1 yr



MCADAMS

FlexTable: Catchment Table (TLA-22001.ppc)

Current Time: 0.00 min

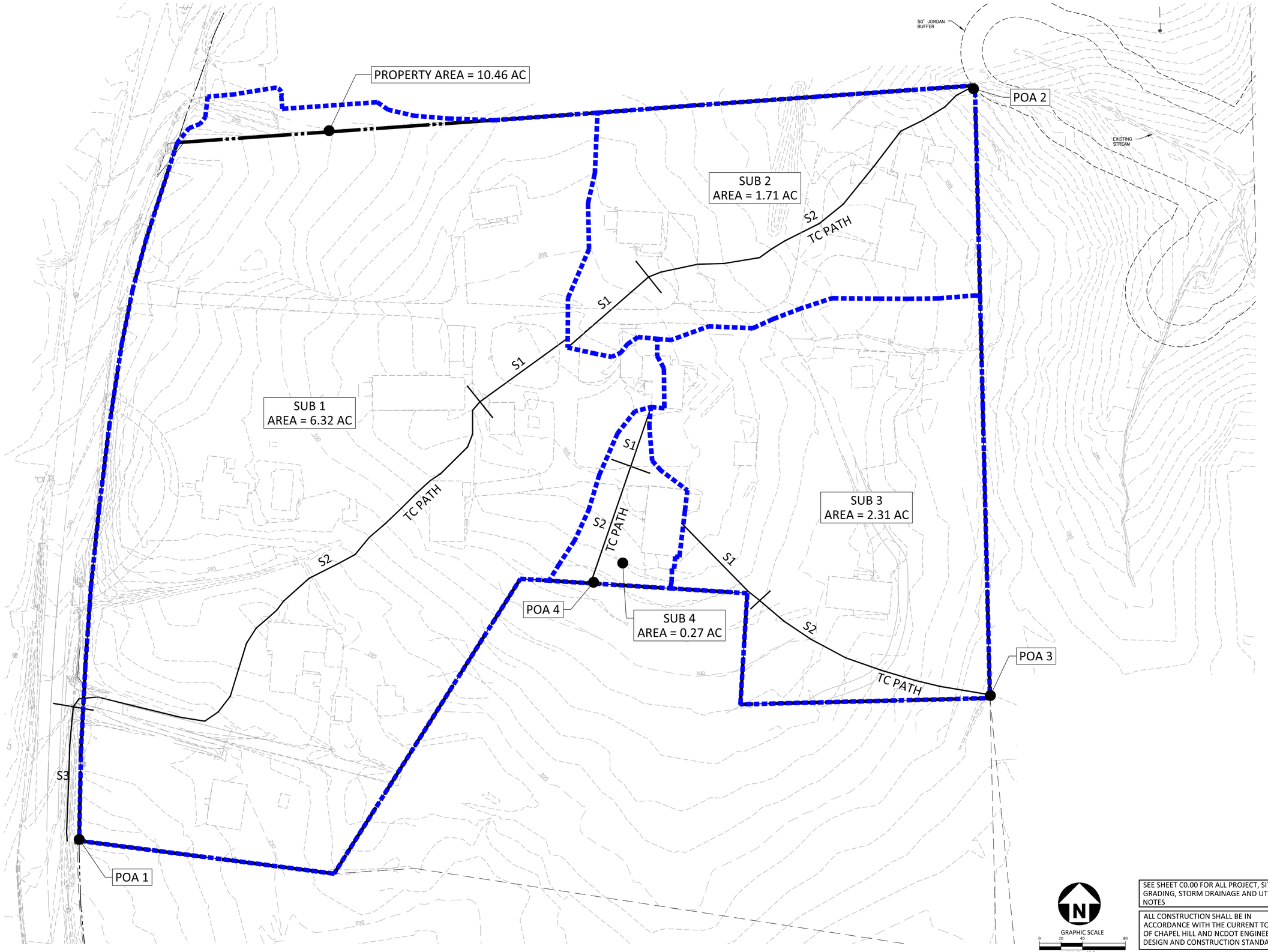
Label	Outflow Node	Area (ft²)	SCS CN	Time of Concentration (min)	Notes
SUB 1	POA 1	275,179	81	18.52	PRE
SUB 3	POA 3	100,434	81	14.11	PRE
SUB 2	POA 2	74,669	83	15.33	PRE
SUB 4	POA 4	11,879	86	12.81	PRE

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
SUB 1	Pre-Dev 1 yr	1	0.668	731.00	8.39
SUB 1	Pre-Dev 2 yr	2	0.921	731.00	11.51
SUB 1	Pre-Dev 25 yr	25	2.079	731.00	21.98
SUB 3	Pre-Dev 1 yr	1	0.244	728.00	3.54
SUB 3	Pre-Dev 2 yr	2	0.336	728.00	4.84
SUB 3	Pre-Dev 25 yr	25	0.760	728.00	9.11
SUB 2	Pre-Dev 1 yr	1	0.200	728.00	2.80
SUB 2	Pre-Dev 2 yr	2	0.272	728.00	3.76
SUB 2	Pre-Dev 25 yr	25	0.594	728.00	6.86
SUB 4	Pre-Dev 1 yr	1	0.037	726.00	0.56
SUB 4	Pre-Dev 2 yr	2	0.049	726.00	0.73
SUB 4	Pre-Dev 25 yr	25	0.102	726.00	1.26

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
POA 1	Pre-Dev 1 yr	1	0.668	731.00	8.39
POA 1	Pre-Dev 2 yr	2	0.921	731.00	11.51
POA 1	Pre-Dev 25 yr	25	2.079	731.00	21.98
POA 3	Pre-Dev 1 yr	1	0.244	728.00	3.54
POA 3	Pre-Dev 2 yr	2	0.336	728.00	4.84
POA 3	Pre-Dev 25 yr	25	0.760	728.00	9.11
POA 2	Pre-Dev 1 yr	1	0.200	728.00	2.80
POA 2	Pre-Dev 2 yr	2	0.272	728.00	3.76
POA 2	Pre-Dev 25 yr	25	0.594	728.00	6.86
POA 4	Pre-Dev 1 yr	1	0.037	726.00	0.56
POA 4	Pre-Dev 2 yr	2	0.049	726.00	0.73
POA 4	Pre-Dev 25 yr	25	0.102	726.00	1.26



GRAPHIC SCALE
0 20 40 80
1 inch = 40 ft.

SEE SHEET C0.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT TOWN OF CHAPEL HILL AND NCDOT ENGINEERING DESIGN AND CONSTRUCTION STANDARDS

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

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CLIENT

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Toll Brothers APARTMENT LIVING

BARBEE CHAPEL APARTMENTS
CONDITIONAL ZONING PERMIT
DRAWINGS
5101 BARBEE CHAPEL RD
CHAPEL HILL, NC 27517

REVISIONS

NO. DATE

PLAN INFORMATION

PROJECT NO.	TLA-22001
FILENAME	TLA22001-PRE
CHECKED BY	JKW
DRAWN BY	MCT
SCALE	1" = 40'
DATE	02.21.2023

SHEET

PRE-DEVELOPMENT DRAINAGE AREA MAP

PRE

M:\Projects\TLA\TLA22001\04-Production\Water Resources\CZP\Current Drawings\TLA22001-PRE.dwg, 2/21/2023 9:00:20 AM, Maria Torres

POST-DEVELOPMENT HYDROLOGIC CALCULATIONS

BARBEE CHAPEL APARTMENTS

TLA-22001

BARBEE CHAPEL APTS
TLA-22001

POST-DEVELOPMENT HYDROLOGY

Summary of Results

M. Torres, PE
2/20/2023

HYDROLOGY INPUT SUMMARY

Sub-basin ID	Onsite Area [acres]					Offsite Area [acres]					Total Area [acres]	SCS CN	Tc [min]
	Impervious	Open	Wooded	Pond	Total	Impervious	Open	Wooded	Pond	Total			
Sub 1 Bypass	0.42	0.65	0.00	0.00	1.07	0.00	0.15	0.00	0.00	0.15	1.22	86	5.00
Sub 1 to SCM A	2.17	0.54	0.00	0.00	2.71	0.00	0.00	0.00	0.00	0.00	2.71	94	5.00
Sub 2 Bypass	0.00	0.17	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.17	80	5.00
Sub 2 to SCM B	5.19	1.02	0.00	0.00	6.22	0.00	0.00	0.00	0.00	0.00	6.22	95	5.00
Sub 3	0.00	0.26	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.26	80	5.00
Sub 4	0.00	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.04	80	5.00
Totals =	7.78	2.68	0.00	0.00	**10.46**	0.00	0.15	0.00	0.00	0.15	**10.61**		

NUTRIENT INPUT SUMMARY

****Stormwater Nitrogen And Phosphorous Tool Inputs*

Land Use	Area (sf)	Area (ac)
Roadway Area	0	0.00
Driveway / Parking	171,771	3.94
Roof Area	107,193	2.46
Sidewalk / Patio	60,085	1.38
Open	116,792	2.68
Wooded	0	0.00
Pond	0	0.00
Total	**455,841**	**10.46**

BARBEE CHAPEL APTS
TLA-22001

POST-DEVELOPMENT HYDROLOGY
Subbasin 1 Bypass

M. Torres, PE
2/20/2023

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	8,075	0.19
Roof	0	0.00
Sidewalk / Patio	10,313	0.24
Other	0	0.00
Totals	18,388	0.42

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	18,388	0.42	-
Onsite open	80	28,186	0.65	Assume good condition
Onsite wooded	77	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	6,395	0.15	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	1.22	acres
	52,969	sf
Composite SCS CN =	86	
% Impervious =	34.7%	

III. TIME OF CONCENTRATION INFORMATION.

Time of concentration assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

BARBEE CHAPEL APTS
TLA-22001

POST-DEVELOPMENT HYDROLOGY
Subbasin 1 to SCM A

M. Torres, PE
2/20/2023

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	43,701	1.00
Roof	29,664	0.68
Sidewalk / Patio	21,048	0.48
Other	0	0.00
Totals	94,413	2.17

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	94,413	2.17	-
Onsite open	80	23,682	0.54	Assume good condition
Onsite wooded	77	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	2.71	acres
	118,095	sf
Composite SCS CN =	94	
% Impervious =	79.9%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

BARBEE CHAPEL APTS
TLA-22001

POST-DEVELOPMENT HYDROLOGY
Subbasin 2 Bypass

M. Torres, PE
2/20/2023

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	0	0.00	-
Onsite open	80	7,271	0.17	Assume good condition
Onsite wooded	77	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	0.17	acres
	7,271	sf
Composite SCS CN =	80	
% Impervious =	0.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

BARBEE CHAPEL APTS
TLA-22001

POST-DEVELOPMENT HYDROLOGY

Subbasin 2 to SCM B

M. Torres, PE
2/20/2023

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	119,995	2.75
Roof	77,529	1.78
Sidewalk / Patio	28,724	0.66
Other	0	0.00
Totals	226,248	5.19

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	226,248	5.19	-
Onsite open	80	44,618	1.02	Assume good condition
Onsite wooded	77	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	6.22	acres
	270,866	sf
Composite SCS CN =	95	
% Impervious =	83.5%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

BARBEE CHAPEL APTS
TLA-22001

POST-DEVELOPMENT HYDROLOGY
Subbasin 3

M. Torres, PE
2/20/2023

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	0	0.00	-
Onsite open	80	11,295	0.26	Assume good condition
Onsite wooded	77	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	0.26	acres
	11,295	sf
Composite SCS CN =	80	
% Impervious =	0.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

BARBEE CHAPEL APTS
TLA-22001

POST-DEVELOPMENT HYDROLOGY
Subbasin 4

M. Torres, PE
2/20/2023

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	0	0.00	-
Onsite open	80	1,740	0.04	Assume good condition
Onsite wooded	77	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

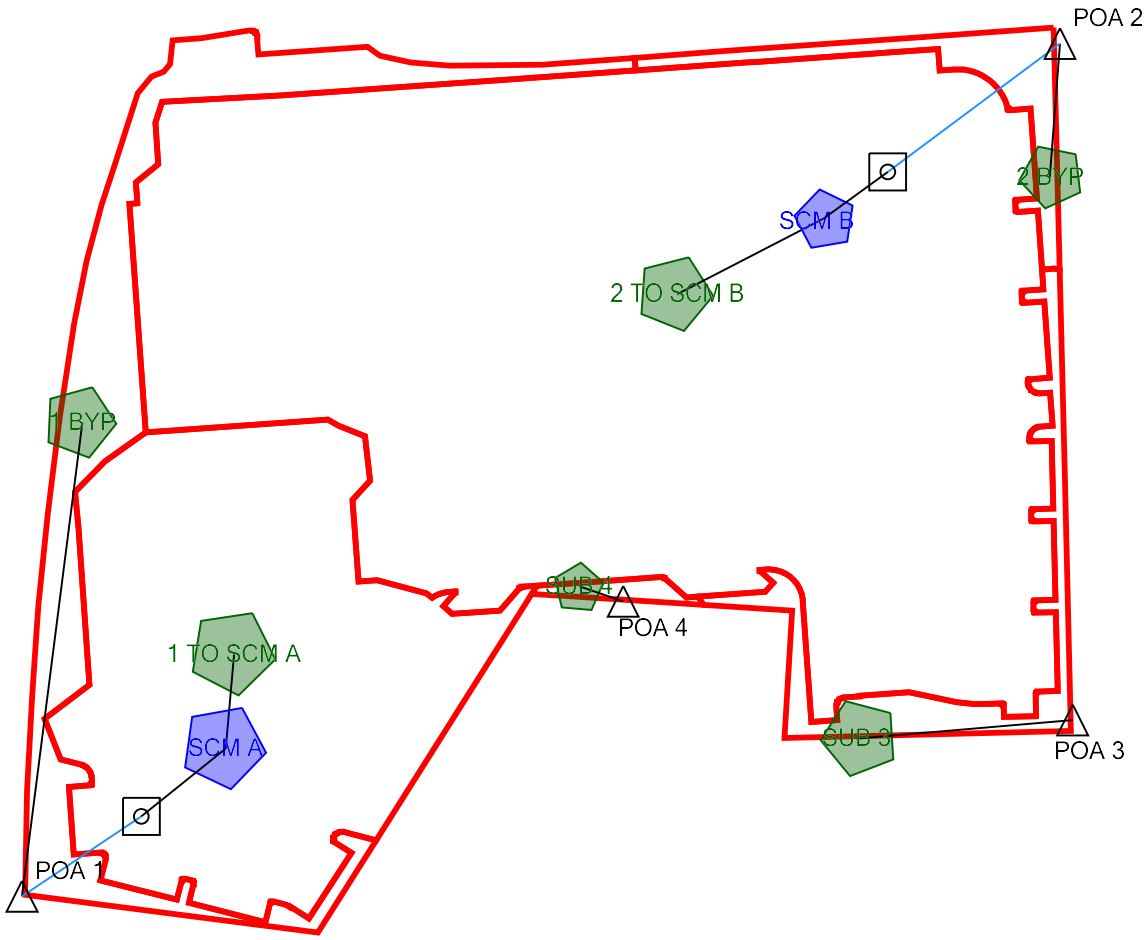
Total area =	0.04	acres
	1,740	sf
Composite SCS CN =	80	
% Impervious =	0.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Scenario: Post-Dev 1 yr



MCADAMS

FlexTable: Catchment Table (TLA-22001.ppc)

Current Time: 0.00 min

Label	Area (ft^2)	SCS CN	Time of Concentration (min)	Notes
1 TO SCM A	118,095	94	5.00	POST
1 BYP	52,969	86	5.00	POST
2 TO SCM B	270,866	95	5.00	POST
2 BYP	7,271	80	5.00	POST
SUB 4	1,740	80	5.00	POST
SUB 3	11,295	80	5.00	POST

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft³/s)
1 TO SCM A	Post-Dev 1 yr	1	0.520	721.00	10.74
1 TO SCM A	Post-Dev 2 yr	2	0.653	721.00	13.03
1 TO SCM A	Post-Dev 10 yr	10	1.006	721.00	17.28
1 TO SCM A	Post-Dev 25 yr	25	1.216	721.00	19.20
1 TO SCM A	Post-Dev 100 yr	100	1.552	721.00	21.80
1 BYP	Post-Dev 1 yr	1	0.164	721.00	3.48
1 BYP	Post-Dev 2 yr	2	0.218	721.00	4.52
1 BYP	Post-Dev 10 yr	10	0.365	721.00	6.62
1 BYP	Post-Dev 25 yr	25	0.455	721.00	7.61
1 BYP	Post-Dev 100 yr	100	0.601	721.00	8.94
2 TO SCM B	Post-Dev 1 yr	1	1.243	721.00	25.40
2 TO SCM B	Post-Dev 2 yr	2	1.552	721.00	30.59
2 TO SCM B	Post-Dev 10 yr	10	2.365	721.00	40.16
2 TO SCM B	Post-Dev 25 yr	25	2.848	721.00	44.48
2 TO SCM B	Post-Dev 100 yr	100	3.621	721.00	50.35
2 BYP	Post-Dev 1 yr	1	0.017	722.00	0.35
2 BYP	Post-Dev 2 yr	2	0.023	721.00	0.48
2 BYP	Post-Dev 10 yr	10	0.042	721.00	0.77
2 BYP	Post-Dev 25 yr	25	0.054	721.00	0.91
2 BYP	Post-Dev 100 yr	100	0.073	721.00	1.11
SUB 4	Post-Dev 1 yr	1	0.004	722.00	0.08
SUB 4	Post-Dev 2 yr	2	0.006	721.00	0.11
SUB 4	Post-Dev 10 yr	10	0.010	721.00	0.18
SUB 4	Post-Dev 25 yr	25	0.013	721.00	0.22
SUB 4	Post-Dev 100 yr	100	0.017	721.00	0.26
SUB 3	Post-Dev 1 yr	1	0.026	722.00	0.54
SUB 3	Post-Dev 2 yr	2	0.036	721.00	0.75
SUB 3	Post-Dev 10 yr	10	0.065	721.00	1.19
SUB 3	Post-Dev 25 yr	25	0.083	721.00	1.42
SUB 3	Post-Dev 100 yr	100	0.113	721.00	1.72

Node Summary

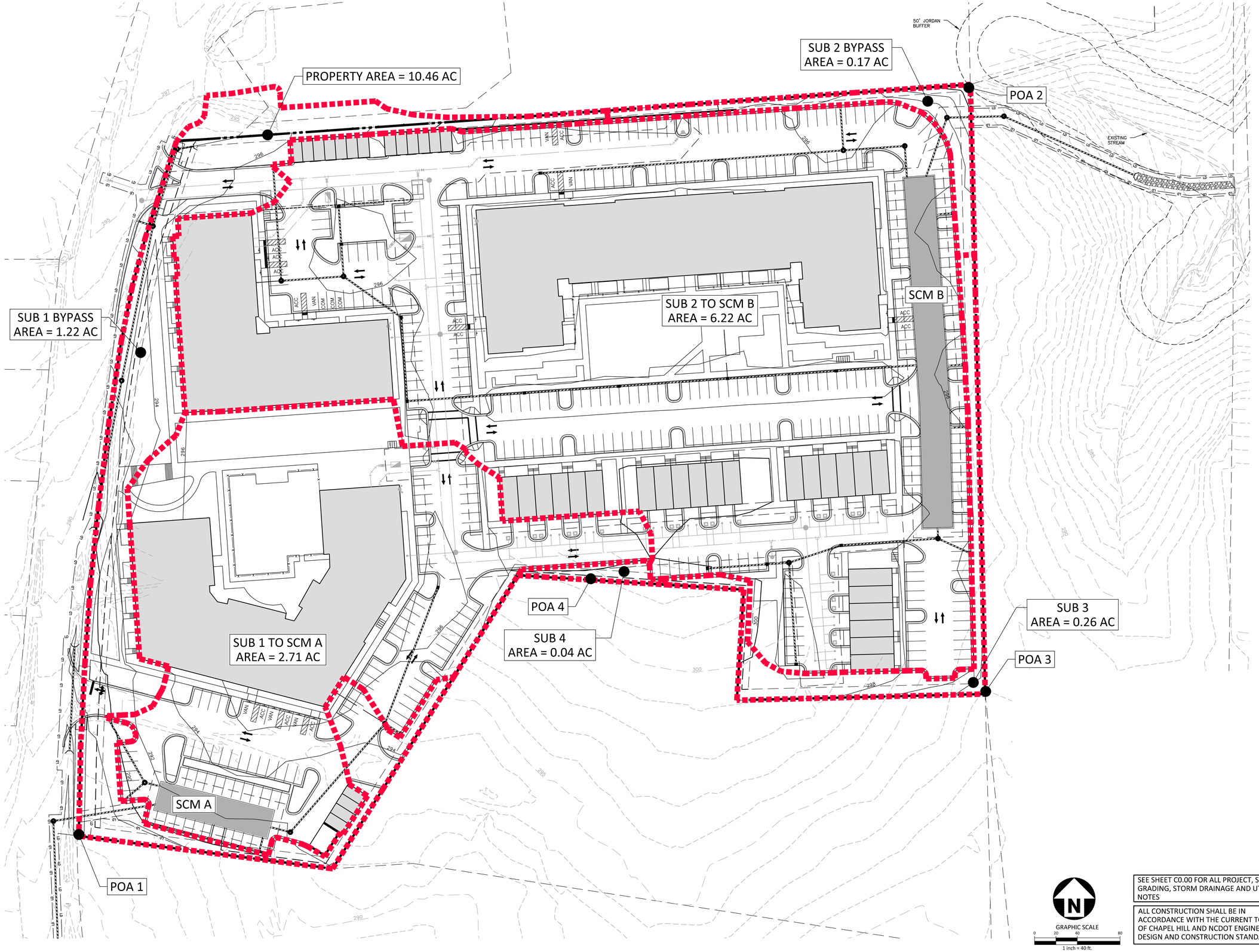
Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft³/s)
POA 1	Post-Dev 1 yr	1	0.519	726.00	7.12
POA 1	Post-Dev 2 yr	2	0.696	723.00	10.37
POA 1	Post-Dev 10 yr	10	1.193	724.00	17.04
POA 1	Post-Dev 25 yr	25	1.492	723.00	20.35
POA 1	Post-Dev 100 yr	100	1.973	723.00	25.06
POA 3	Post-Dev 1 yr	1	0.026	722.00	0.54
POA 3	Post-Dev 2 yr	2	0.036	721.00	0.75
POA 3	Post-Dev 10 yr	10	0.065	721.00	1.19
POA 3	Post-Dev 25 yr	25	0.083	721.00	1.42
POA 3	Post-Dev 100 yr	100	0.113	721.00	1.72
POA 2	Post-Dev 1 yr	1	0.433	722.00	0.62
POA 2	Post-Dev 2 yr	2	0.669	783.00	1.35
POA 2	Post-Dev 10 yr	10	1.454	752.00	3.98
POA 2	Post-Dev 25 yr	25	1.938	752.00	4.99
POA 2	Post-Dev 100 yr	100	2.724	751.00	14.04

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
POA 4	Post-Dev 1 yr	1	0.004	722.00	0.08
POA 4	Post-Dev 2 yr	2	0.006	721.00	0.11
POA 4	Post-Dev 10 yr	10	0.010	721.00	0.18
POA 4	Post-Dev 25 yr	25	0.013	721.00	0.22
POA 4	Post-Dev 100 yr	100	0.017	721.00	0.26

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
SCM B (IN)	Post-Dev 1 yr	1	1.243	721.00	25.40	(N/A)	(N/A)
SCM B (OUT)	Post-Dev 1 yr	1	0.416	1,079.00	0.39	285.79	0.907
SCM B (IN)	Post-Dev 2 yr	2	1.552	721.00	30.59	(N/A)	(N/A)
SCM B (OUT)	Post-Dev 2 yr	2	0.646	784.00	1.32	286.44	1.044
SCM B (IN)	Post-Dev 10 yr	10	2.365	721.00	40.16	(N/A)	(N/A)
SCM B (OUT)	Post-Dev 10 yr	10	1.412	756.00	3.85	288.22	1.419
SCM B (IN)	Post-Dev 25 yr	25	2.848	721.00	44.48	(N/A)	(N/A)
SCM B (OUT)	Post-Dev 25 yr	25	1.885	756.00	4.81	289.44	1.676
SCM B (IN)	Post-Dev 100 yr	100	3.621	721.00	50.35	(N/A)	(N/A)
SCM B (OUT)	Post-Dev 100 yr	100	2.651	751.00	13.72	290.57	1.916
SCM A (IN)	Post-Dev 1 yr	1	0.520	721.00	10.74	(N/A)	(N/A)
SCM A (OUT)	Post-Dev 1 yr	1	0.355	728.00	5.00	286.21	0.222
SCM A (IN)	Post-Dev 2 yr	2	0.653	721.00	13.03	(N/A)	(N/A)
SCM A (OUT)	Post-Dev 2 yr	2	0.479	727.00	7.11	286.69	0.253
SCM A (IN)	Post-Dev 10 yr	10	1.006	721.00	17.28	(N/A)	(N/A)
SCM A (OUT)	Post-Dev 10 yr	10	0.828	725.00	12.04	287.37	0.297
SCM A (IN)	Post-Dev 25 yr	25	1.216	721.00	19.20	(N/A)	(N/A)
SCM A (OUT)	Post-Dev 25 yr	25	1.037	724.00	14.23	287.53	0.307
SCM A (IN)	Post-Dev 100 yr	100	1.552	721.00	21.80	(N/A)	(N/A)
SCM A (OUT)	Post-Dev 100 yr	100	1.373	724.00	17.41	287.72	0.320



GRAPHIC SCALE
0 20 40 80
1 inch = 40 ft.

SEE SHEET C0.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT TOWN OF CHAPEL HILL AND NCDOT ENGINEERING DESIGN AND CONSTRUCTION STANDARDS

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

M:\Projects\TLA\TLA22001\04-Production\Water Resources\CZP\Current Drawings\TLA22001-POST.dwg, 2/21/2023 3:44:48 PM, Maria Torres

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5101 BARBEE CHAPEL RD
CHAPEL HILL, NC 27517

REVISIONS

PLAN INFORMATION

PROJECT NO.	TLA-22001
FILENAME	TLA22001-POST
CHECKED BY	JKW
DRAWN BY	MCT
SCALE	1" = 40'
DATE	02.21.2023

SHEET

POST-DEVELOPMENT DRAINAGE AREA MAP

POST

STORMWATER CONTROL MEASURE 'A'
DESIGN CALCULATIONS

BARBEE CHAPEL APARTMENTS

TLA-22001

Determination of Water Quality Volume (WQV)

Note: The following design calculations are based upon requirements from the Minimum Design Criteria.

$$WQV = (P)(R_V)(A)/12 \times 43{,}560$$

where,

WQV= water quality volume (CF)
R_V = 0.05+0.009(I) where I is percent impervious cover
A = area in acres
P = rainfall (in inches)

Input data:

Total area, A =	2.71	acres
Impervious area =	2.17	acres
Percent impervious cover, I =	79.9	%
Rainfall, P =	1.0	inches

Calculated values:

R_V =	0.77	
WQV =	0.17	acre-ft
=	7573	cf.

Sizing is based upon the adjusted water quality volume, WQV_{adj} (75% of the total WQV).

WQV_{adj} =	5680	cf.

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Subsection: Elevation-Area Volume Curve
Label: SCM A
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
282.75	0.00	2,800	0	0.000	0.000
284.50	0.00	2,800	8,400	0.112	0.112
288.00	0.00	2,800	8,400	0.225	0.337

Subsection: Outlet Input Data
Label: SCM A
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Requested Pond Water Surface Elevations	
Minimum (Headwater)	282.75 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	288.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	WQ Orifice	Forward	Culvert - 1	282.75	288.00
Rectangular Weir	Weir - 1	Forward	Culvert - 1	285.50	286.00
Orifice-Area	Orifice - 1	Forward	Culvert - 1	286.00	288.00
Rectangular Weir	Weir - 2	Forward	Culvert - 1	287.00	288.00
Culvert-Circular	Culvert - 1	Forward	TW	282.25	288.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

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Subsection: Outlet Input Data
Label: SCM A
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	24.0 in
Length	84.00 ft
Length (Computed Barrel)	84.01 ft
Slope (Computed)	0.011 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	1
Kb	0
Kr	1
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0098
M	2.0000
C	0.0398
Y	0.6700
T1 ratio (HW/D)	1
T2 ratio (HW/D)	1
Slope Correction Factor	-1

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	284.56 ft	T1 Flow	15.55 ft^3/s
T2 Elevation	284.85 ft	T2 Flow	17.77 ft^3/s

Subsection: Outlet Input Data
Label: SCM A
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Structure ID: WQ Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	282.75 ft
Orifice Diameter	1.7 in
Orifice Coefficient	1

Structure ID: Orifice - 1 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	285.50 ft
Orifice Area	1.50 ft²
Top Elevation	286.00 ft
Datum Elevation	285.75 ft
Orifice Coefficient	1

Structure ID: Weir - 2 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	287.00 ft
Weir Length	4.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	285.50 ft
Weir Length	3.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Composite Rating Curve
Label: SCM A
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
282.75	0.00	(N/A)	0.00	(no Q: WQ Orifice,Weir - 1,Orifice - 1,Weir - 2,Culvert - 1)
282.75	0.00	(N/A)	0.00	(no Q: WQ Orifice,Weir - 1,Orifice - 1,Weir - 2,Culvert - 1)
282.85	0.01	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.95	0.03	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.05	0.04	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.15	0.04	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.25	0.05	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.35	0.05	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.45	0.06	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.55	0.06	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.65	0.07	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.75	0.07	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.85	0.08	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.95	0.08	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.05	0.08	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.15	0.09	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.25	0.09	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.35	0.09	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)

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Subsection: Composite Rating Curve
Label: SCM A
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
284.45	0.10	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.55	0.10	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.65	0.10	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.75	0.10	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.85	0.10	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.95	0.10	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.05	0.11	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.15	0.12	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.25	0.12	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.35	0.12	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.45	0.12	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.50	0.12	(N/A)	0.00	WQ Orifice,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.55	0.23	(N/A)	0.00	WQ Orifice,Weir - 1,Culvert - 1 (no Q: Orifice - 1,Weir - 2)
285.65	0.64	(N/A)	0.00	WQ Orifice,Weir - 1,Culvert - 1 (no Q: Orifice - 1,Weir - 2)
285.75	1.24	(N/A)	0.00	WQ Orifice,Weir - 1,Culvert - 1 (no Q: Orifice - 1,Weir - 2)
285.85	1.95	(N/A)	0.00	WQ Orifice,Weir - 1,Culvert - 1 (no Q: Orifice - 1,Weir - 2)
285.95	2.76	(N/A)	0.00	WQ Orifice,Weir - 1,Culvert - 1 (no Q: Orifice - 1,Weir - 2)
286.05	4.08	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)

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Subsection: Composite Rating Curve
Label: SCM A
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
286.15	4.69	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.25	5.23	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.35	5.71	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.45	6.17	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.55	6.59	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.65	6.97	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.75	7.35	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.85	7.70	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.95	8.04	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.00	8.21	(N/A)	0.00	WQ Orifice,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.05	8.50	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
287.15	9.37	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
287.25	10.45	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
287.35	11.70	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
287.45	13.08	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
287.55	14.57	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
287.65	16.17	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
287.75	17.83	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)

Subsection: Composite Rating Curve
Label: SCM A
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
287.85	19.57	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
287.95	21.41	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
288.00	22.34	(N/A)	0.00	WQ Orifice,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)

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Subsection: Level Pool Pond Routing Summary
Label: SCM A (IN)
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	282.75 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.00 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	10.74 ft³/s	Time to Peak (Flow, In)	721.00 min
Flow (Peak Outlet)	5.00 ft³/s	Time to Peak (Flow, Outlet)	728.00 min

Elevation (Water Surface, Peak)	286.21 ft
Volume (Peak)	0.222 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	0.520 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.355 ac-ft
Volume (Retained)	0.164 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

Subsection: Level Pool Pond Routing Summary
Label: SCM A (IN)
Scenario: Post-Dev 2 yr

Return Event: 2 years
Storm Event: 2 yr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	282.75 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.00 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	13.03 ft³/s	Time to Peak (Flow, In)	721.00 min
Flow (Peak Outlet)	7.11 ft³/s	Time to Peak (Flow, Outlet)	727.00 min

Elevation (Water Surface, Peak)	286.69 ft
Volume (Peak)	0.253 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	0.653 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.479 ac-ft
Volume (Retained)	0.174 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

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Subsection: Level Pool Pond Routing Summary
Label: SCM A (IN)
Scenario: Post-Dev 10 yr

Return Event: 10 years
Storm Event: 10 yr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	282.75 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.00 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	17.28 ft³/s	Time to Peak (Flow, In)	721.00 min
Flow (Peak Outlet)	12.04 ft³/s	Time to Peak (Flow, Outlet)	725.00 min

Elevation (Water Surface, Peak)	287.37 ft
Volume (Peak)	0.297 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	1.006 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.828 ac-ft
Volume (Retained)	0.178 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

Subsection: Level Pool Pond Routing Summary
Label: SCM A (IN)
Scenario: Post-Dev 25 yr

Return Event: 25 years
Storm Event: 25 yr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	282.75 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.00 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	19.20 ft³/s	Time to Peak (Flow, In)	721.00 min
Flow (Peak Outlet)	14.23 ft³/s	Time to Peak (Flow, Outlet)	724.00 min

Elevation (Water Surface, Peak)	287.53 ft
Volume (Peak)	0.307 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	1.216 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	1.037 ac-ft
Volume (Retained)	0.179 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

MCADAMS

Subsection: Level Pool Pond Routing Summary
Label: SCM A (IN)
Scenario: Post-Dev 100 yr

Return Event: 100 years
Storm Event: 100 yr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	282.75 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.00 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	21.80 ft³/s	Time to Peak (Flow, In)	721.00 min
Flow (Peak Outlet)	17.41 ft³/s	Time to Peak (Flow, Outlet)	724.00 min

Elevation (Water Surface, Peak)	287.72 ft
Volume (Peak)	0.320 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	1.552 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	1.373 ac-ft
Volume (Retained)	0.179 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

STORMWATER CONTROL MEASURE B'
DESIGN CALCULATIONS

BARBEE CHAPEL APARTMENTS

TLA-22001

BARBEE CHAPEL APTS
TLA-22001

STORM FILTER "B" DESIGN

M. Torres, PE
2/20/2023

Determination of Water Quality Volume (WQV)

Note: The following design calculations are based upon requirements from the Minimum Design Criteria.

$$WQV = (P)(R_V)(A)/12 \times 43{,}560$$

where,

WQV= water quality volume (CF)
R_V = 0.05+0.009(I) where I is percent impervious cover
A = area in acres
P = rainfall (in inches)

Input data:

Total area, A =	6.22	acres
Impervious area =	5.19	acres
Percent impervious cover, I =	83.5	%
Rainfall, P =	1.0	inches

Calculated values:

R_V =	0.80	
WQV =	0.42	acre-ft
=	18097	cf.

Sizing is based upon the adjusted water quality volume, WQV_{adj} (75% of the total WQV).

WQV_{adj} =	13573	cf.

MCADAMS

Subsection: Elevation-Area Volume Curve
Label: SCM B
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
281.50	0.00	9,200	0	0.000	0.000
285.00	0.00	9,200	27,600	0.739	0.739
291.00	0.00	9,200	27,600	1.267	2.006

MCADAMS

Subsection: Outlet Input Data
Label: SCM B
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Requested Pond Water Surface Elevations	
Minimum (Headwater)	281.50 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	291.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - WQ	Forward	Culvert - 1	281.50	291.00
Rectangular Weir	Weir - 1	Forward	Culvert - 1	286.00	286.50
Orifice-Area	Orifice - 1	Forward	Culvert - 1	286.50	291.00
Rectangular Weir	Weir - 2	Forward	Culvert - 1	290.25	291.00
Culvert-Circular	Culvert - 1	Forward	TW	281.00	291.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: SCM B
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	24.0 in
Length	250.00 ft
Length (Computed Barrel)	250.01 ft
Slope (Computed)	0.008 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	1
Kb	0
Kr	1
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0098
M	2.0000
C	0.0398
Y	0.6700
T1 ratio (HW/D)	1
T2 ratio (HW/D)	1
Slope Correction Factor	-1

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	283.31 ft	T1 Flow	15.55 ft^3/s
T2 Elevation	283.61 ft	T2 Flow	17.77 ft^3/s

Subsection: Outlet Input Data
Label: SCM B
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Structure ID: Orifice - WQ Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	281.50 ft
Orifice Diameter	2.7 in
Orifice Coefficient	1

Structure ID: Orifice - 1 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	286.00 ft
Orifice Area	0.50 ft²
Top Elevation	286.50 ft
Datum Elevation	286.25 ft
Orifice Coefficient	1

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	286.00 ft
Weir Length	1.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: Weir - 2 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	290.25 ft
Weir Length	15.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Composite Rating Curve
Label: SCM B
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
281.50	0.00	(N/A)	0.00	(no Q: Orifice - WQ,Weir - 1,Orifice - 1,Weir - 2,Culvert - 1)
281.60	0.01	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
281.70	0.05	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
281.80	0.08	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
281.90	0.10	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.00	0.12	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.10	0.13	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.20	0.15	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.30	0.16	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.40	0.17	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.50	0.18	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.60	0.19	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.70	0.20	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.80	0.21	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
282.90	0.22	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.00	0.23	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.10	0.23	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.20	0.24	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)

Subsection: Composite Rating Curve
Label: SCM B
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
283.30	0.24	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.40	0.25	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.50	0.25	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.60	0.26	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.70	0.26	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.80	0.27	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
283.90	0.27	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.00	0.28	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.10	0.28	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.20	0.29	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.30	0.31	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.40	0.32	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.50	0.32	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.60	0.33	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.70	0.33	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.80	0.34	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
284.90	0.35	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.00	0.35	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)

MCADAMS

Subsection: Composite Rating Curve
Label: SCM B
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
285.10	0.36	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.20	0.36	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.30	0.37	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.40	0.37	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.50	0.38	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.60	0.38	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.70	0.39	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.80	0.39	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
285.90	0.40	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
286.00	0.40	(N/A)	0.00	Orifice - WQ,Culvert - 1 (no Q: Weir - 1,Orifice - 1,Weir - 2)
286.10	0.50	(N/A)	0.00	Orifice - WQ,Weir - 1,Culvert - 1 (no Q: Orifice - 1,Weir - 2)
286.20	0.67	(N/A)	0.00	Orifice - WQ,Weir - 1,Culvert - 1 (no Q: Orifice - 1,Weir - 2)
286.30	0.88	(N/A)	0.00	Orifice - WQ,Weir - 1,Culvert - 1 (no Q: Orifice - 1,Weir - 2)
286.40	1.12	(N/A)	0.00	Orifice - WQ,Weir - 1,Culvert - 1 (no Q: Orifice - 1,Weir - 2)
286.50	1.62	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.60	1.85	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.70	2.04	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
286.80	2.21	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)

MCADAMS

Subsection: Composite Rating Curve
Label: SCM B
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
286.90	2.37	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.00	2.52	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.10	2.66	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.20	2.79	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.30	2.91	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.40	3.03	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.50	3.14	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.60	3.25	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.70	3.35	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.80	3.46	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
287.90	3.56	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
288.00	3.65	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
288.10	3.74	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
288.20	3.84	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
288.30	3.92	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
288.40	4.01	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
288.50	4.09	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
288.60	4.18	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)

MCADAMS

Subsection: Composite Rating Curve
Label: SCM B
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
288.70	4.26	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
288.80	4.34	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
288.90	4.41	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
289.00	4.49	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
289.10	4.57	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
289.20	4.64	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
289.30	4.71	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
289.40	4.78	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
289.50	4.86	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
289.60	4.92	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
289.70	4.99	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
289.80	5.06	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
289.90	5.13	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
290.00	5.19	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
290.10	5.26	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
290.20	5.32	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
290.25	5.35	(N/A)	0.00	Orifice - WQ,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
290.30	5.89	(N/A)	0.00	Orifice - WQ,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)

MCADAMS

Subsection: Composite Rating Curve
Label: SCM B
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
290.40	8.05	(N/A)	0.00	Orifice - WQ,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
290.50	11.09	(N/A)	0.00	Orifice - WQ,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
290.60	14.81	(N/A)	0.00	Orifice - WQ,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
290.70	19.07	(N/A)	0.00	Orifice - WQ,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
290.80	23.80	(N/A)	0.00	Orifice - WQ,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
290.90	28.59	(N/A)	0.00	Orifice - WQ,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)
291.00	32.81	(N/A)	0.00	Orifice - WQ,Orifice - 1,Weir - 2,Culvert - 1 (no Q: Weir - 1)

Subsection: Level Pool Pond Routing Summary
Label: SCM B (IN)
Scenario: Post-Dev 1 yr

Return Event: 1 years
Storm Event: 1 yr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	281.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.00 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	25.40 ft³/s	Time to Peak (Flow, In)	721.00 min
Flow (Peak Outlet)	0.39 ft³/s	Time to Peak (Flow, Outlet)	1,079.00 min

Elevation (Water Surface, Peak)	285.79 ft
Volume (Peak)	0.907 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	1.243 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.416 ac-ft
Volume (Retained)	0.826 ac-ft
Volume (Unrouted)	-0.001 ac-ft
Error (Mass Balance)	0.0 %

MCADAMS

Subsection: Level Pool Pond Routing Summary
Label: SCM B (IN)
Scenario: Post-Dev 2 yr

Return Event: 2 years
Storm Event: 2 yr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	281.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.00 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	30.59 ft³/s	Time to Peak (Flow, In)	721.00 min
Flow (Peak Outlet)	1.32 ft³/s	Time to Peak (Flow, Outlet)	784.00 min

Elevation (Water Surface, Peak)	286.44 ft
Volume (Peak)	1.044 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	1.552 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.646 ac-ft
Volume (Retained)	0.906 ac-ft
Volume (Unrouted)	-0.001 ac-ft
Error (Mass Balance)	0.0 %

MCADAMS

Subsection: Level Pool Pond Routing Summary
Label: SCM B (IN)
Scenario: Post-Dev 10 yr

Return Event: 10 years
Storm Event: 10 yr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	281.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.00 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	40.16 ft³/s	Time to Peak (Flow, In)	721.00 min
Flow (Peak Outlet)	3.85 ft³/s	Time to Peak (Flow, Outlet)	756.00 min

Elevation (Water Surface, Peak)	288.22 ft
Volume (Peak)	1.419 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	2.365 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	1.412 ac-ft
Volume (Retained)	0.952 ac-ft
Volume (Unrouted)	-0.001 ac-ft
Error (Mass Balance)	0.0 %

MCADAMS

Subsection: Level Pool Pond Routing Summary
Label: SCM B (IN)
Scenario: Post-Dev 25 yr

Return Event: 25 years
Storm Event: 25 yr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	281.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.00 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	44.48 ft³/s	Time to Peak (Flow, In)	721.00 min
Flow (Peak Outlet)	4.81 ft³/s	Time to Peak (Flow, Outlet)	756.00 min

Elevation (Water Surface, Peak)	289.44 ft
Volume (Peak)	1.676 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	2.848 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	1.885 ac-ft
Volume (Retained)	0.963 ac-ft
Volume (Unrouted)	-0.001 ac-ft
Error (Mass Balance)	0.0 %

MCADAMS

Subsection: Level Pool Pond Routing Summary
Label: SCM B (IN)
Scenario: Post-Dev 100 yr

Return Event: 100 years
Storm Event: 100 yr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	281.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.00 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	50.35 ft³/s	Time to Peak (Flow, In)	721.00 min
Flow (Peak Outlet)	13.72 ft³/s	Time to Peak (Flow, Outlet)	751.00 min

Elevation (Water Surface, Peak)	290.57 ft
Volume (Peak)	1.916 ac-ft

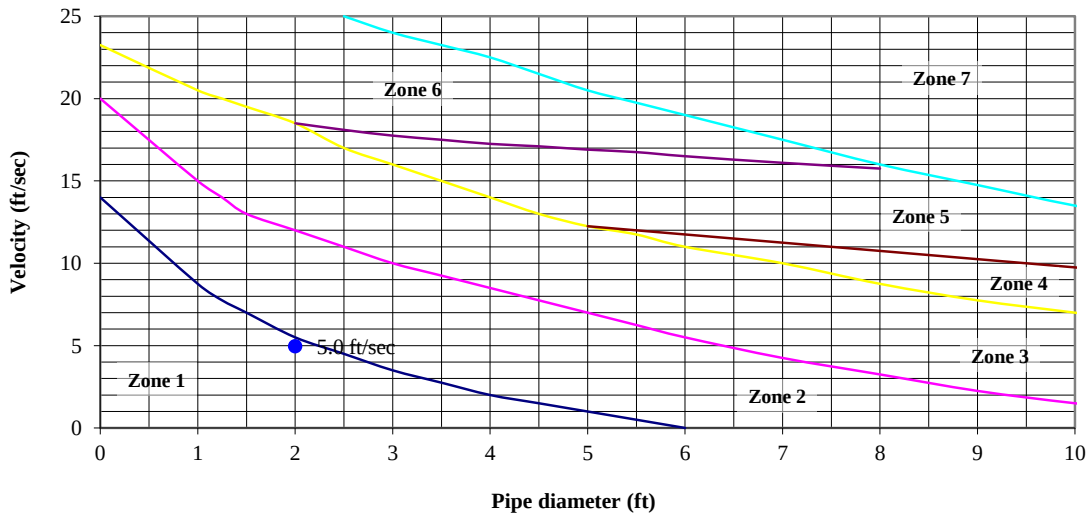
Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	3.621 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	2.651 ac-ft
Volume (Retained)	0.969 ac-ft
Volume (Unrouted)	-0.001 ac-ft
Error (Mass Balance)	0.0 %

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project	Barbee Chapel	Date	2/20/2023
Project No.	TLA-22001	Designer	O. LEFEVRE, EI
Outlet ID	SCM B		

Flow, $Q_{10\text{-}yr}$	3.9	cfs
Slope, S	0.80	%
Pipe Diameter, D_o	24	inches
Pipe Diameter, D_o	2.0	feet
Number of pipes	1	
Pipe separation	0	feet
Manning's n	0.013	

Figure 8.06.b.1



Zone from graph above = 2

Outlet pipe diameter	24 in.	Length =	12.0 ft.
Outlet flowrate	3.9 cfs	Width =	6.0 ft.
Outlet velocity	5.0 ft/sec	Stone diameter =	6 in.
Material =	Class B	Thickness =	22 in.

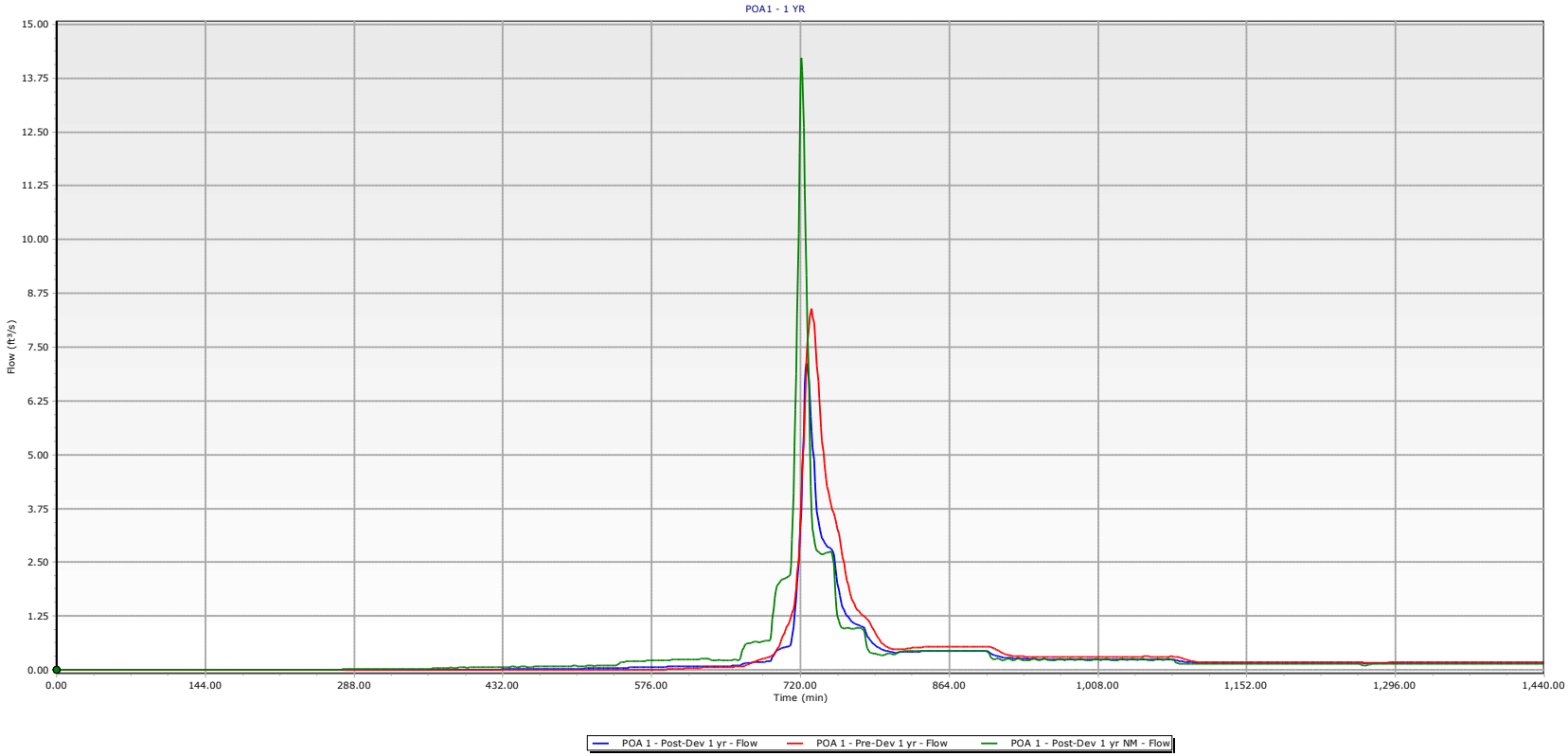
Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	9	4 x D(o)	3 x D(o)
2	Class B	6	22	6 x D(o)	3 x D(o)
3	Class I	13	22	8 x D(o)	3 x D(o)
4	Class I	13	22	8 x D(o)	3 x D(o)
5	Class II	23	27	10 x D(o)	3 x D(o)
6	Class II	23	27	10 x D(o)	3 x D(o)
7	Special study required				

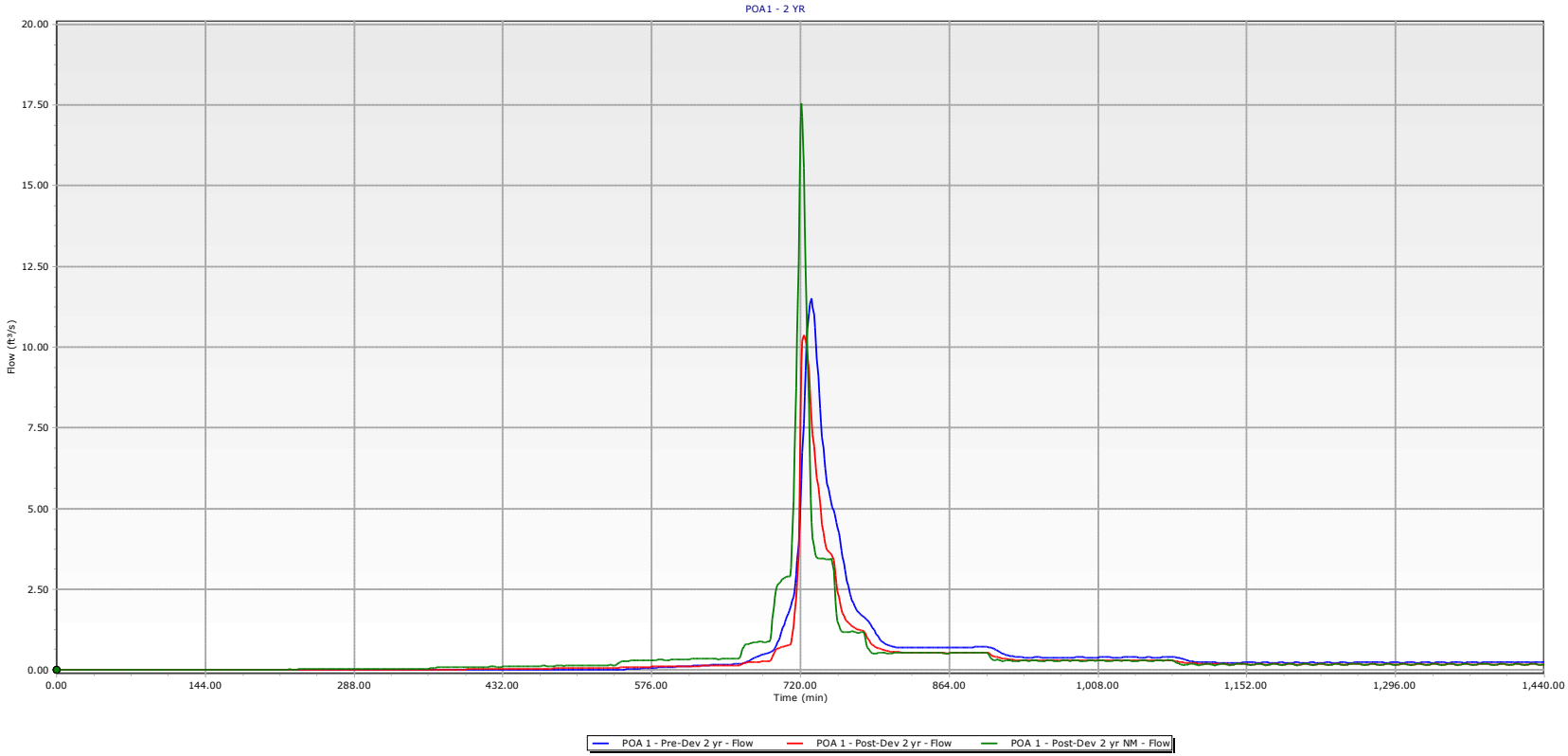
1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual
2. Outlet velocity based on full-flow velocity

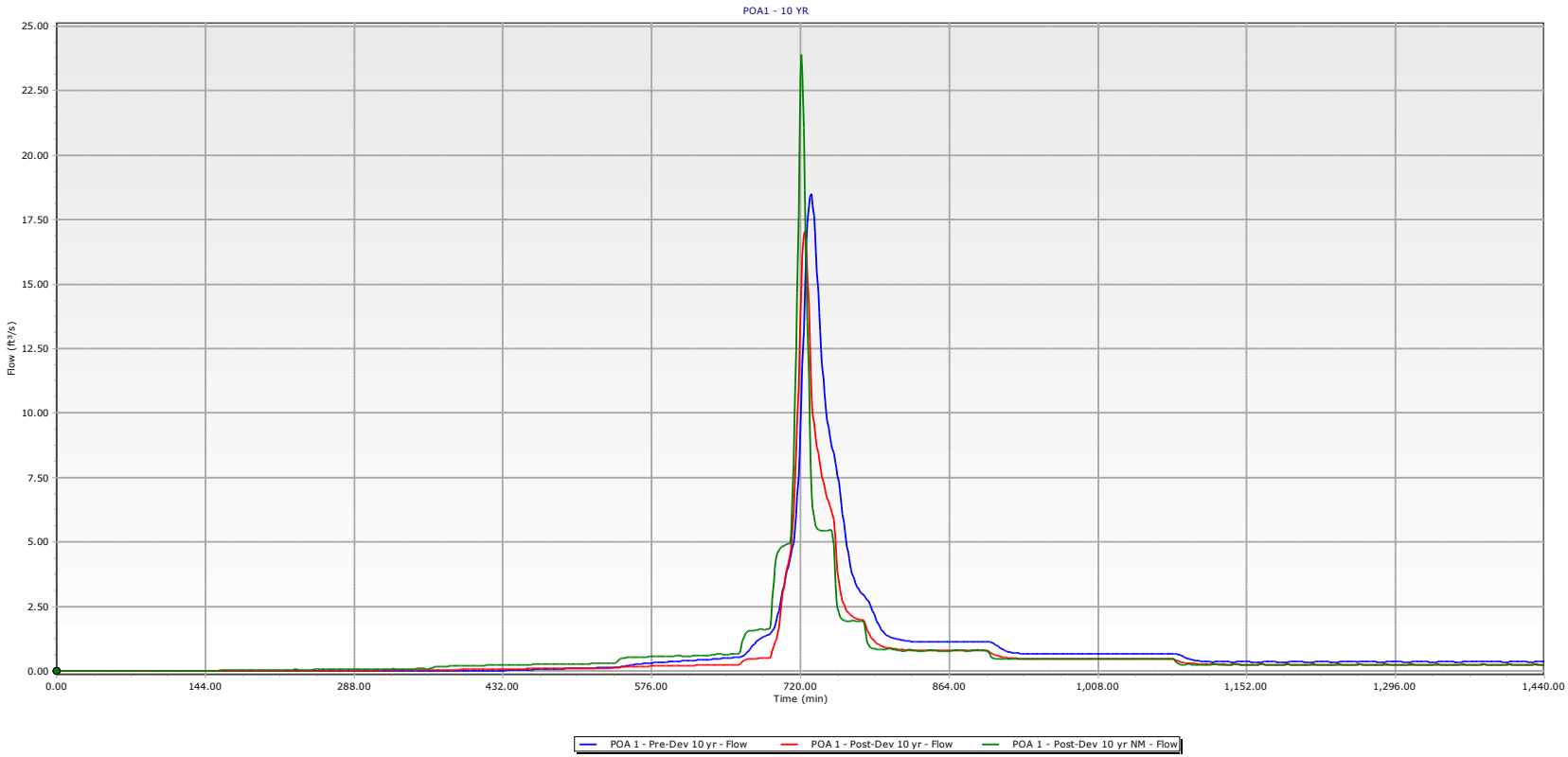
HYDROGRAPH PLOTS

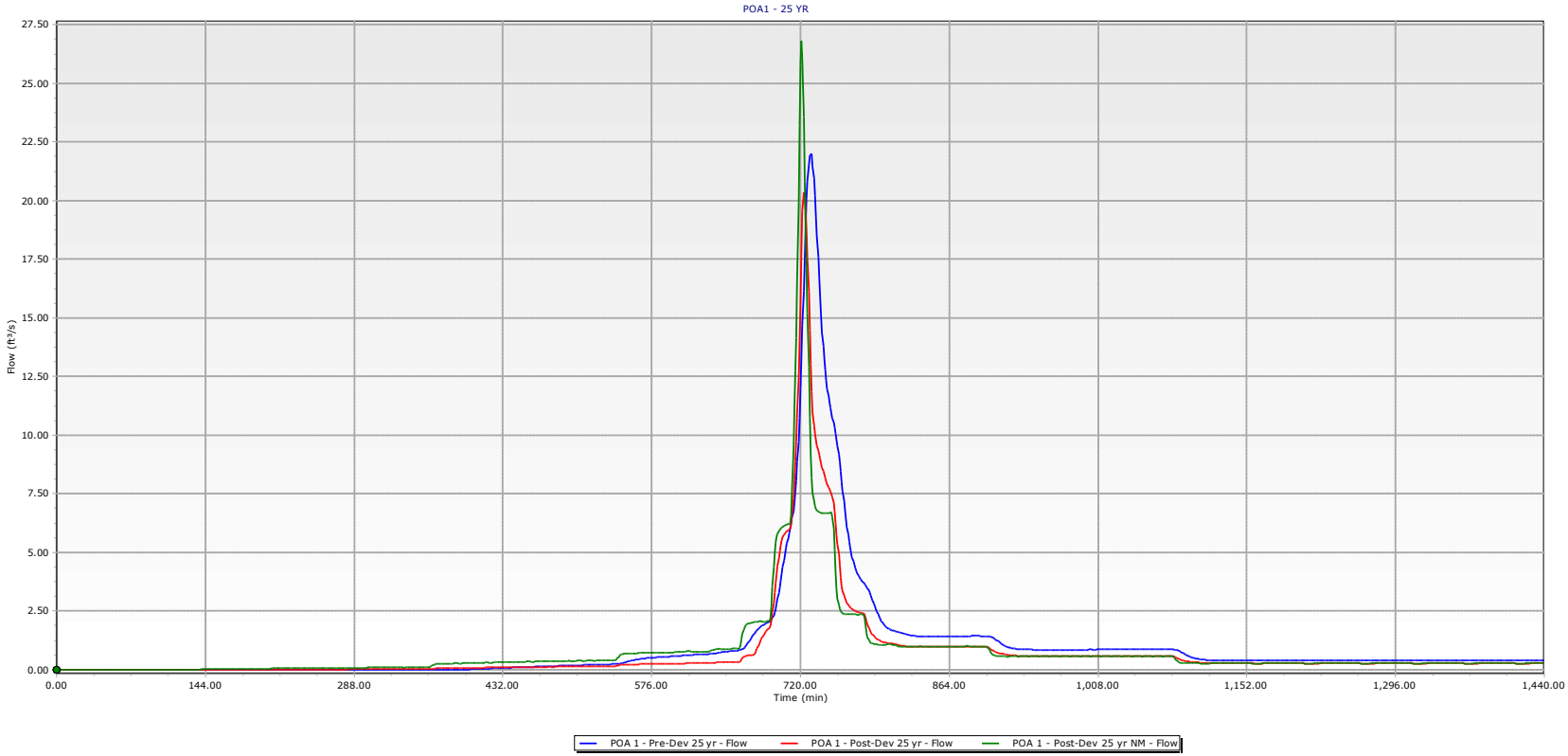
BARBEE CHAPEL APARTMENTS

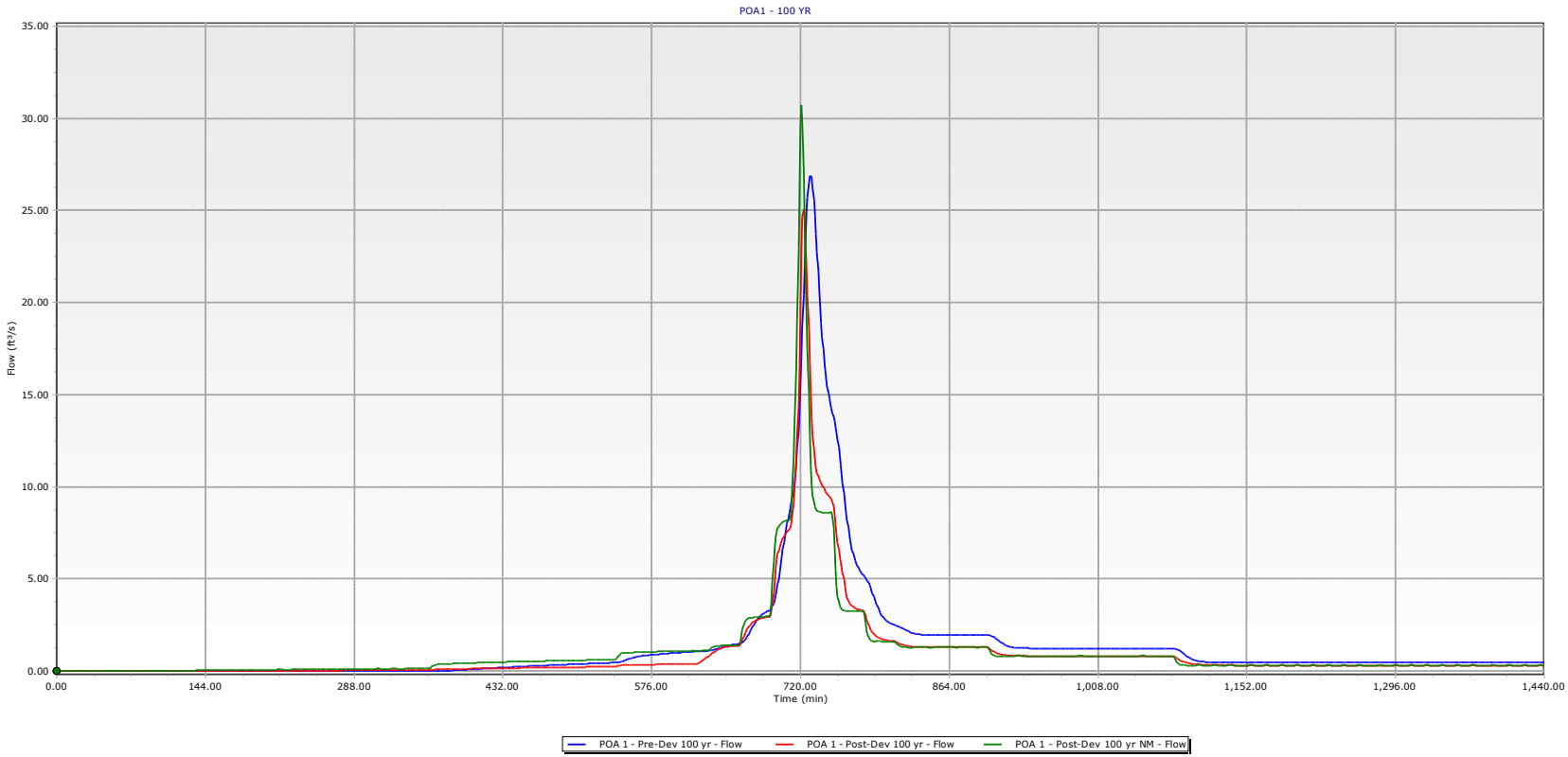
TLA-22001

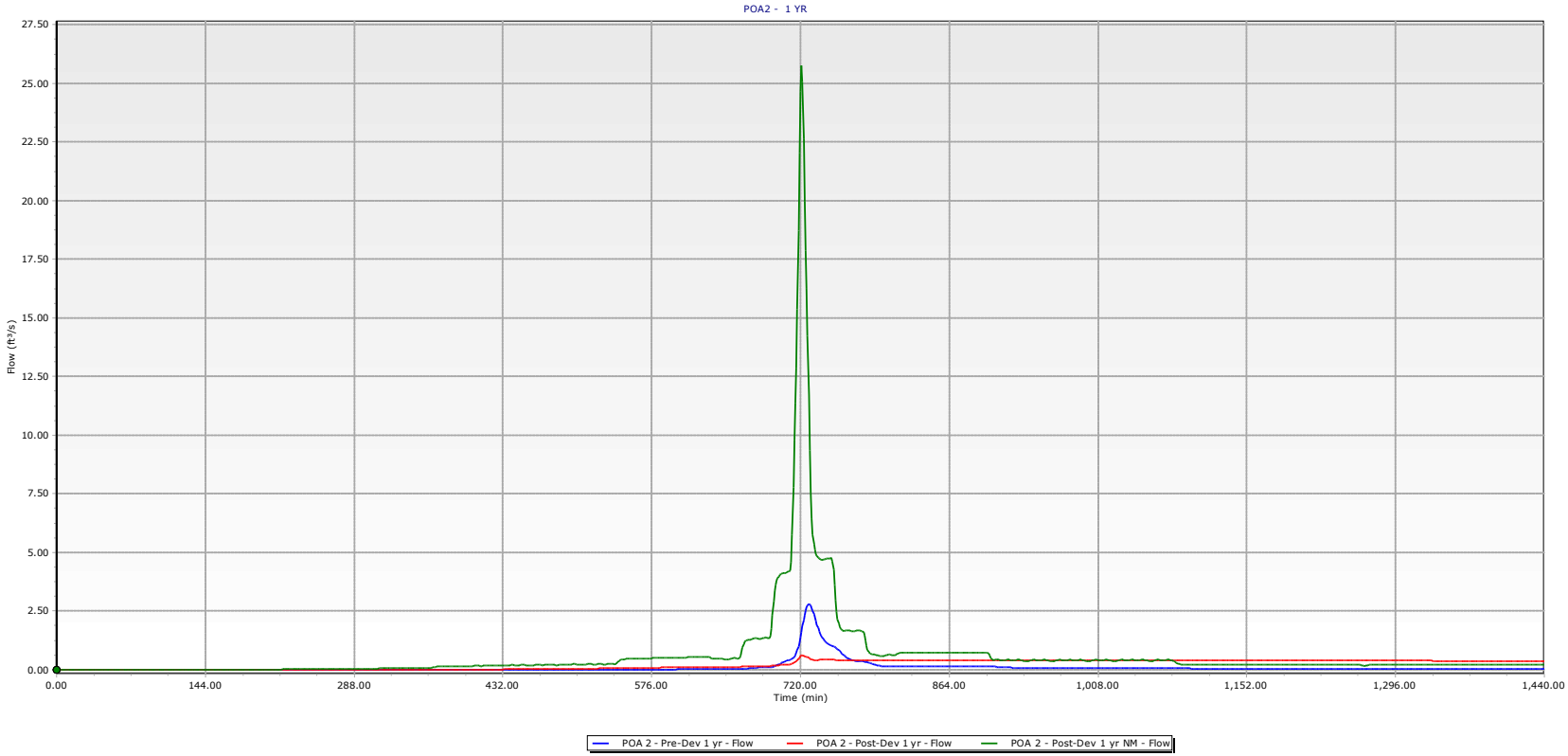

POA1 - 1 YR
15.00
13.75
12.50
11.25
10.00
8.75
7.50
6.25
5.00
3.75
2.50
1.25
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 1 - Post-Dev 1 yr - Flow
POA 1 - Pre-Dev 1 yr - Flow
POA 1 - Post-Dev 1 yr NM - Flow

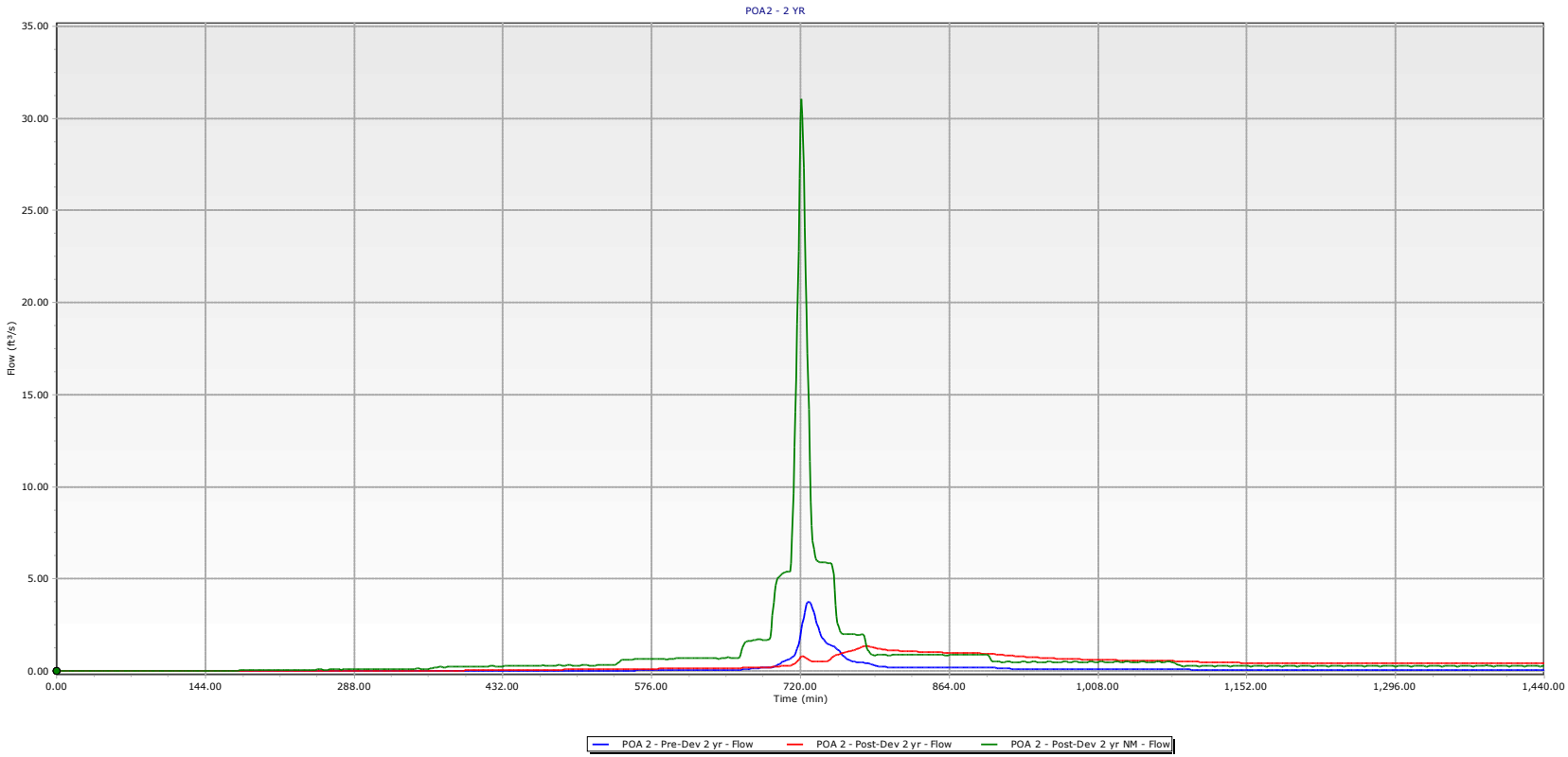

POA1 - 2 YR
20.00
17.50
15.00
12.50
10.00
7.50
5.00
2.50
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 1 - Pre-Dev 2 yr - Flow
POA 1 - Post-Dev 2 yr - Flow
POA 1 - Post-Dev 2 yr NM - Flow

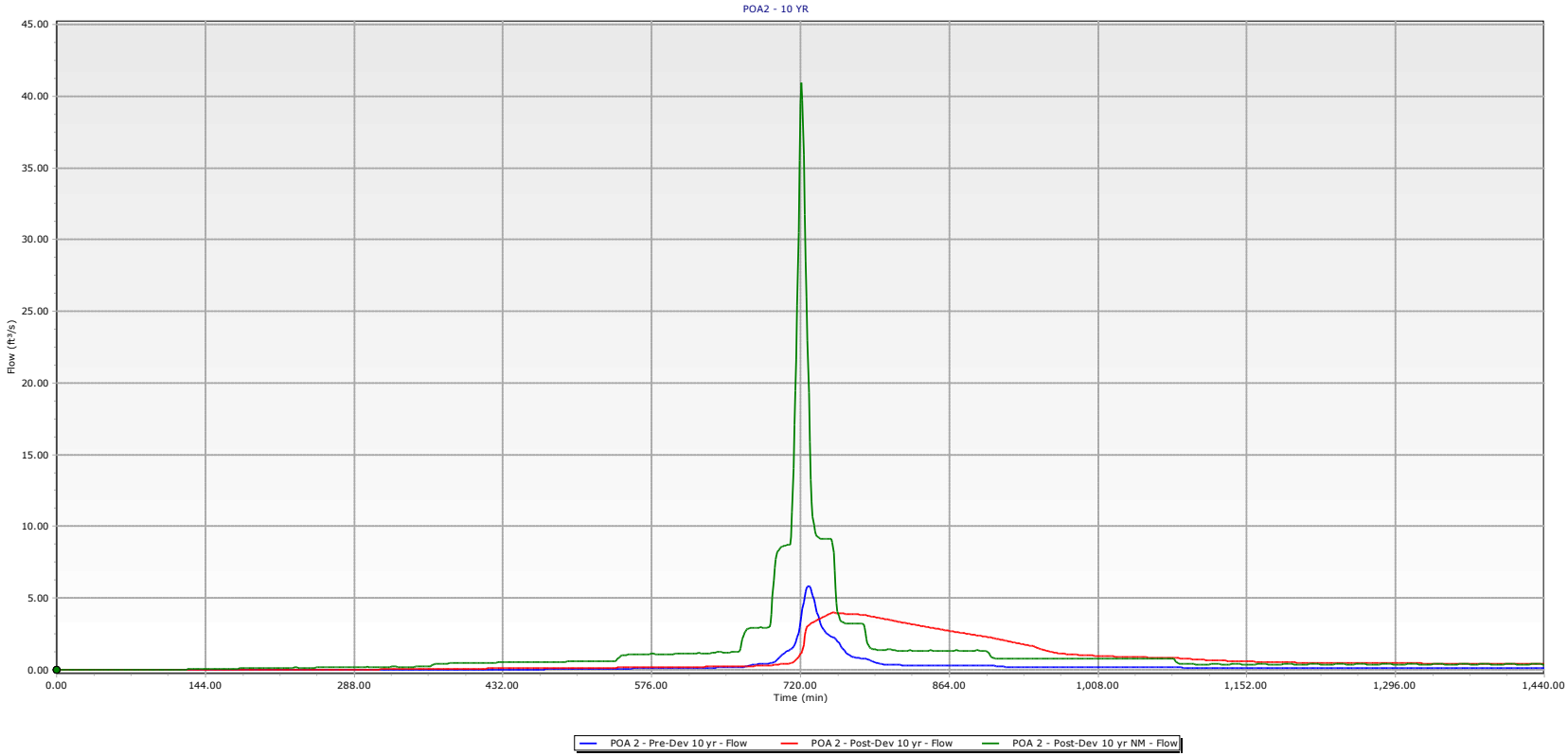

POA1 - 10 YR
25.00
22.50
20.00
17.50
15.00
12.50
10.00
7.50
5.00
2.50
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 1 - Pre-Dev 10 yr - Flow
POA 1 - Post-Dev 10 yr - Flow
POA 1 - Post-Dev 10 yr NM - Flow

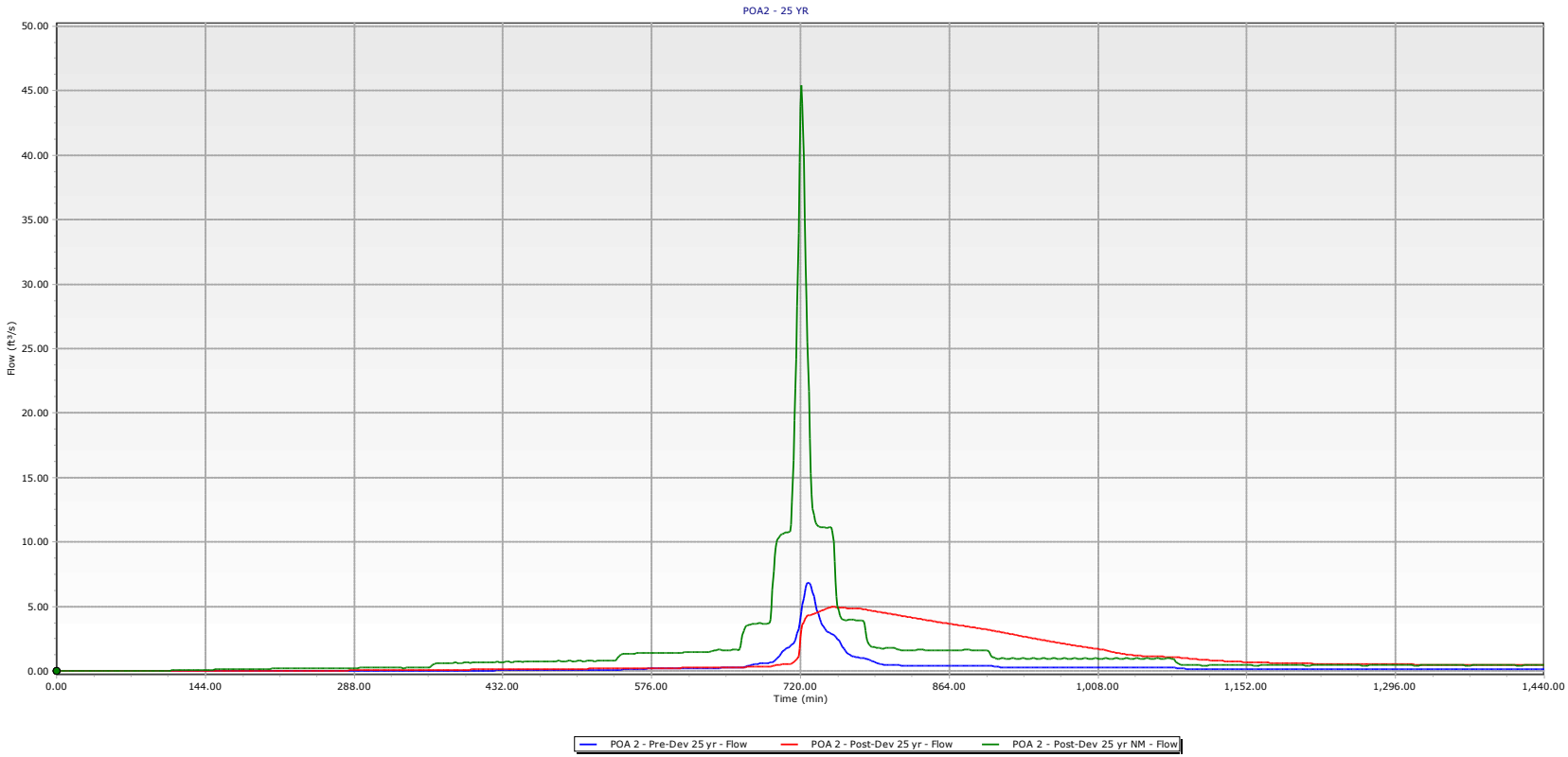

POA1 - 25 YR
27.50
25.00
22.50
20.00
17.50
15.00
12.50
10.00
7.50
5.00
2.50
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 1 - Pre-Dev 25 yr - Flow
POA 1 - Post-Dev 25 yr - Flow
POA 1 - Post-Dev 25 yr NM - Flow

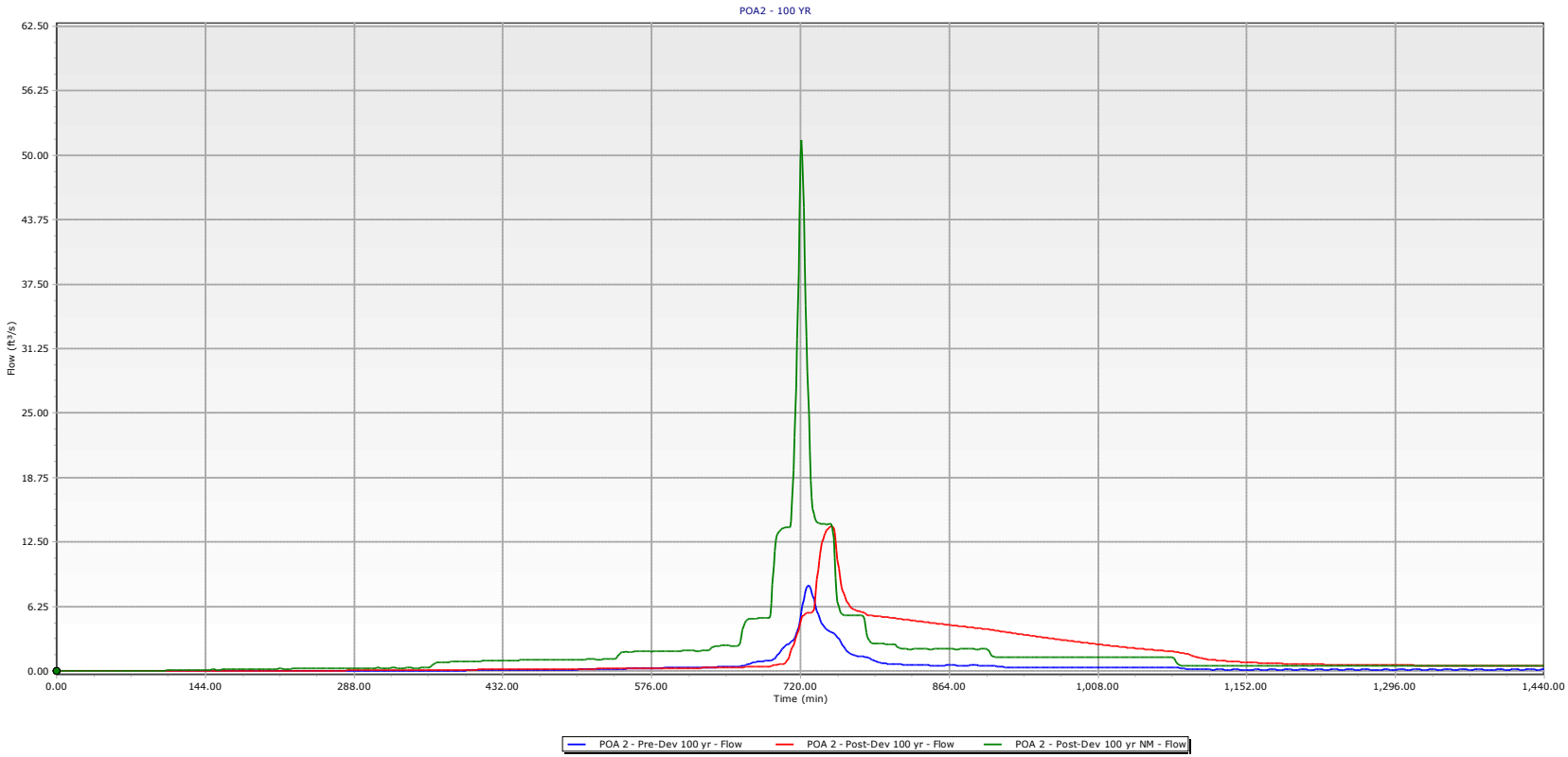

POA1 - 100 YR
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 1 - Pre-Dev 100 yr - Flow
POA 1 - Post-Dev 100 yr - Flow
POA 1 - Post-Dev 100 yr NM - Flow

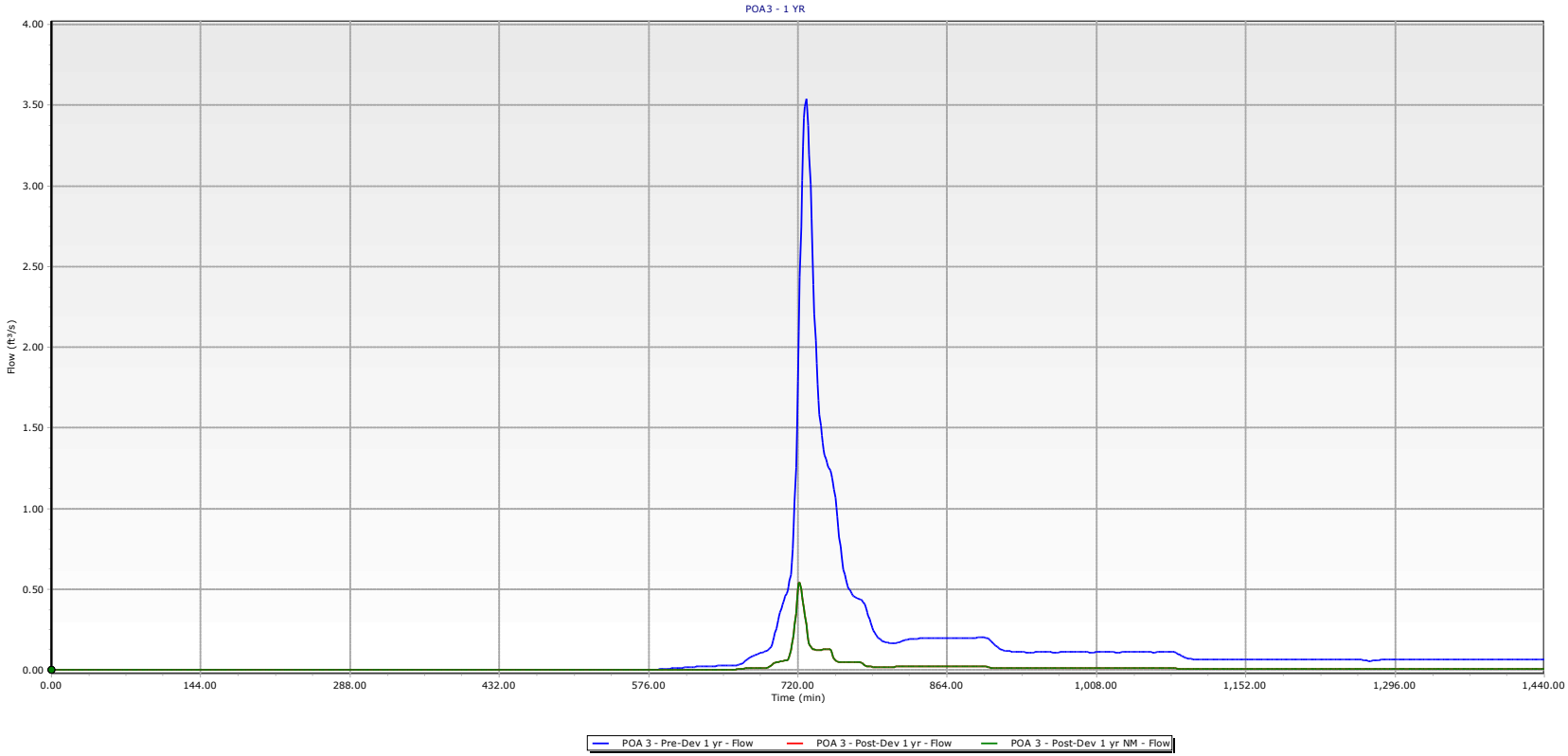

POA2 - 1 YR
27.50
25.00
22.50
20.00
17.50
15.00
12.50
10.00
7.50
5.00
2.50
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 2 - Pre-Dev 1 yr - Flow
POA 2 - Post-Dev 1 yr - Flow
POA 2 - Post-Dev 1 yr NM - Flow

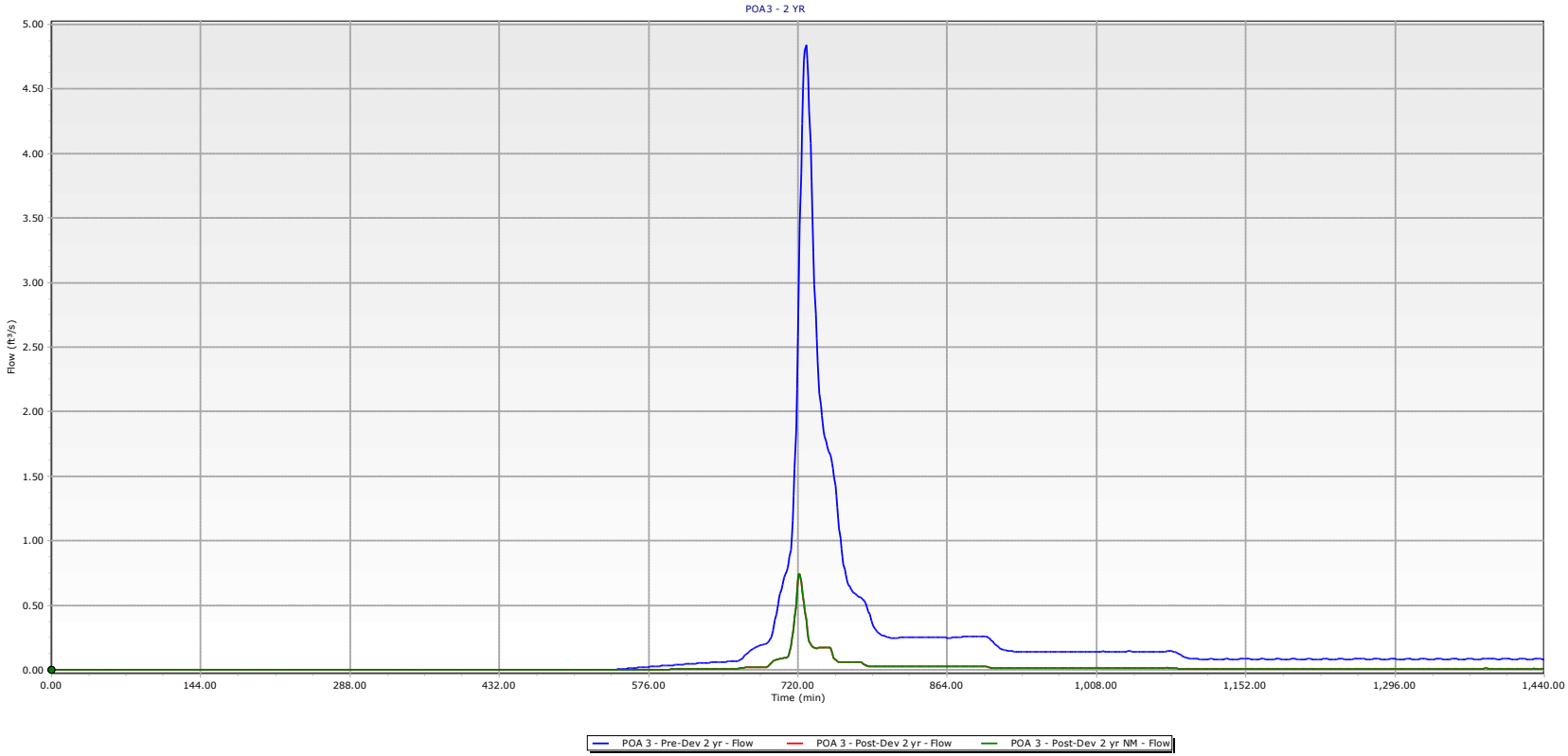

POA2 - 2 YR
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 2 - Pre-Dev 2 yr - Flow
POA 2 - Post-Dev 2 yr - Flow
POA 2 - Post-Dev 2 yr NM - Flow

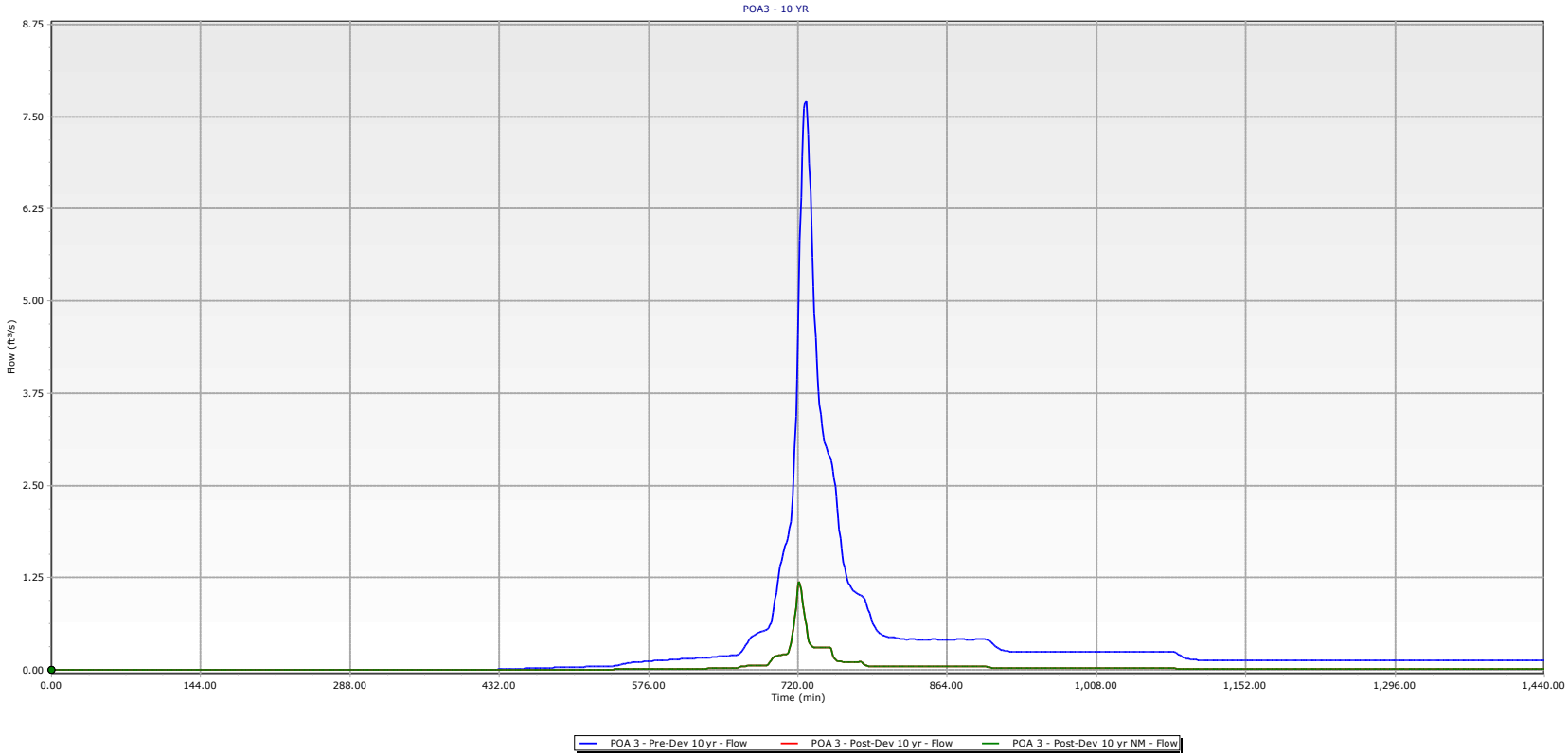

POA2 - 10 YR
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 2 - Pre-Dev 10 yr - Flow
POA 2 - Post-Dev 10 yr - Flow
POA 2 - Post-Dev 10 yr NM - Flow

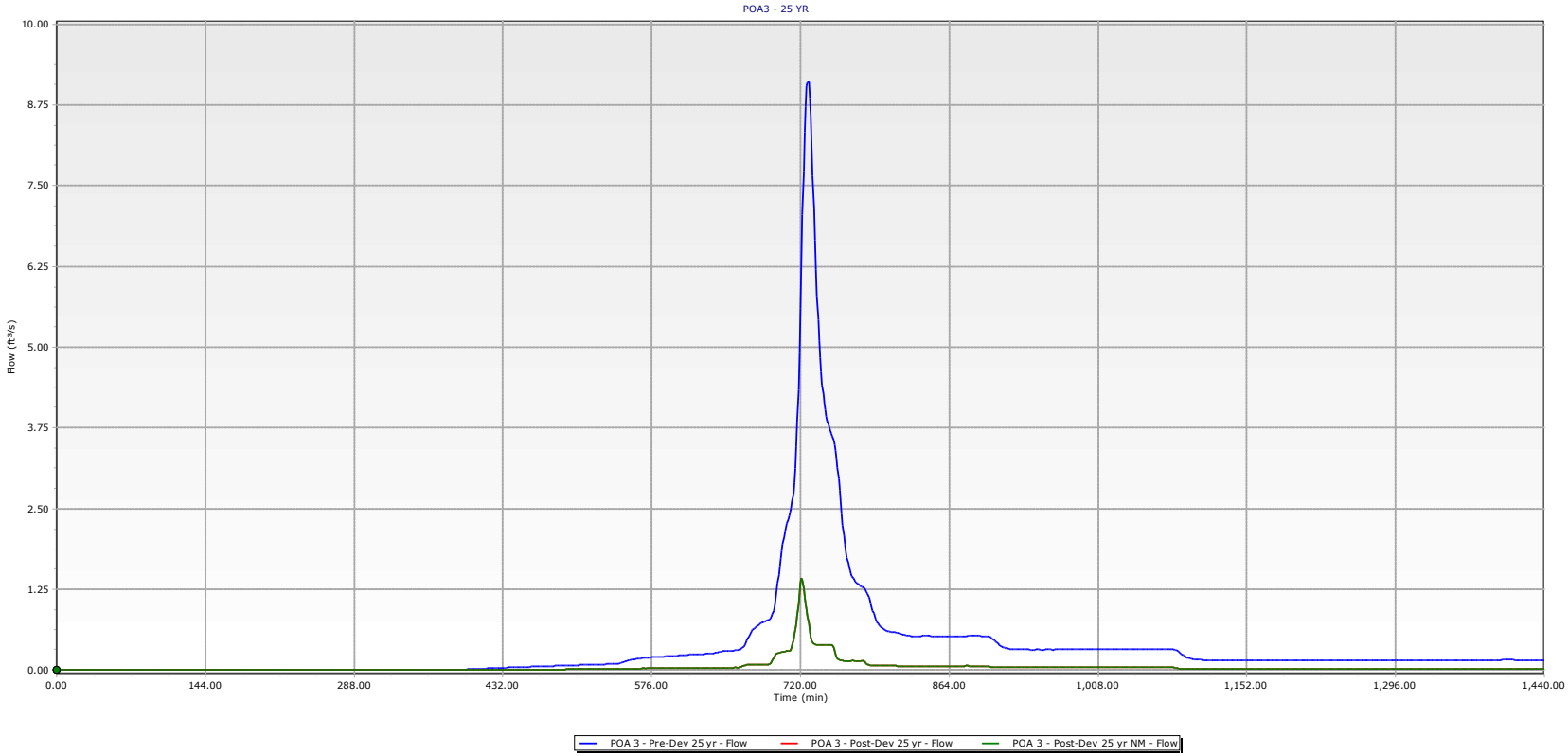

POA2 - 25 YR
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 2 - Pre-Dev 25 yr - Flow
POA 2 - Post-Dev 25 yr - Flow
POA 2 - Post-Dev 25 yr NM - Flow

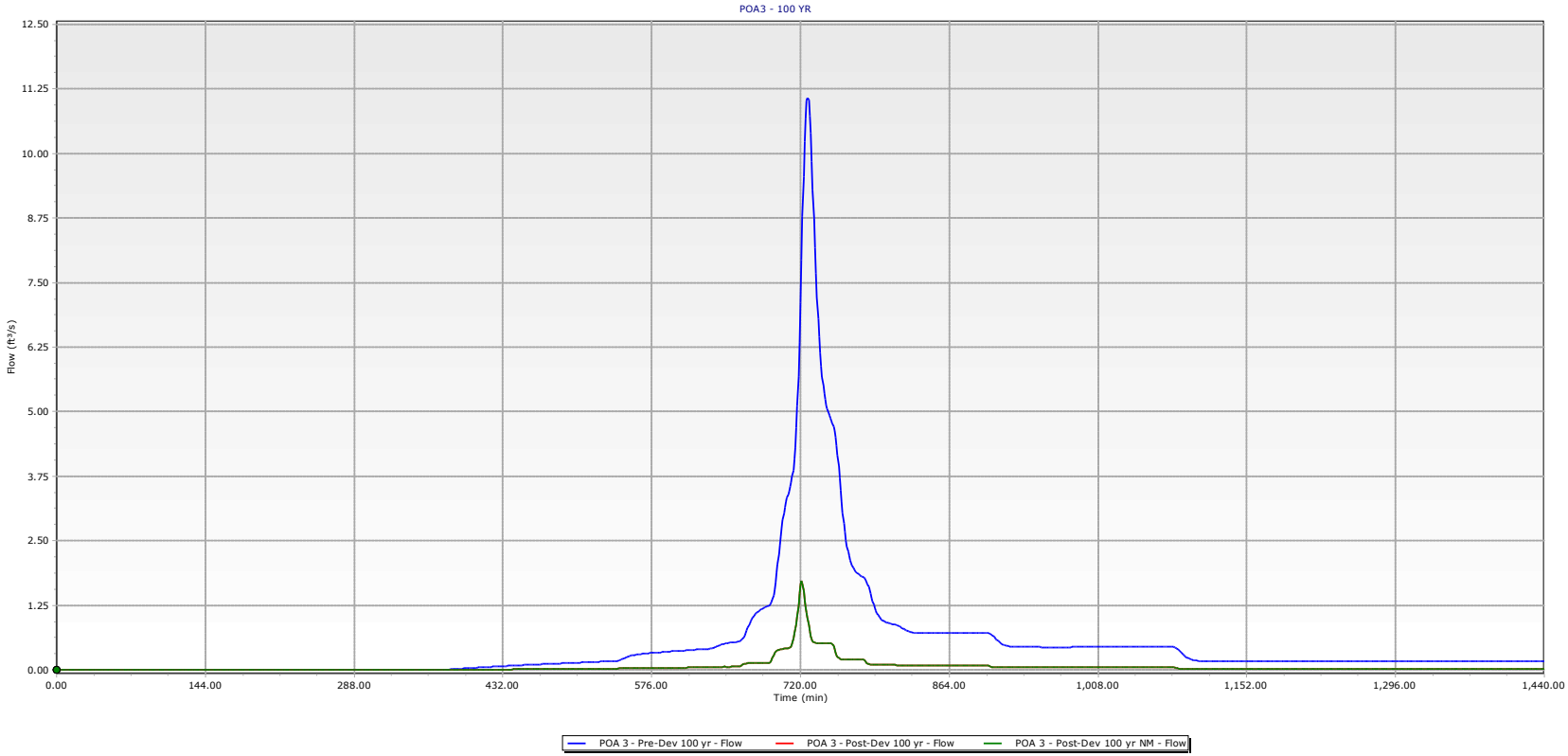

POA2 - 100 YR
62.50
56.25
50.00
43.75
37.50
31.25
25.00
18.75
12.50
6.25
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 2 - Pre-Dev 100 yr - Flow
POA 2 - Post-Dev 100 yr - Flow
POA 2 - Post-Dev 100 yr NM - Flow

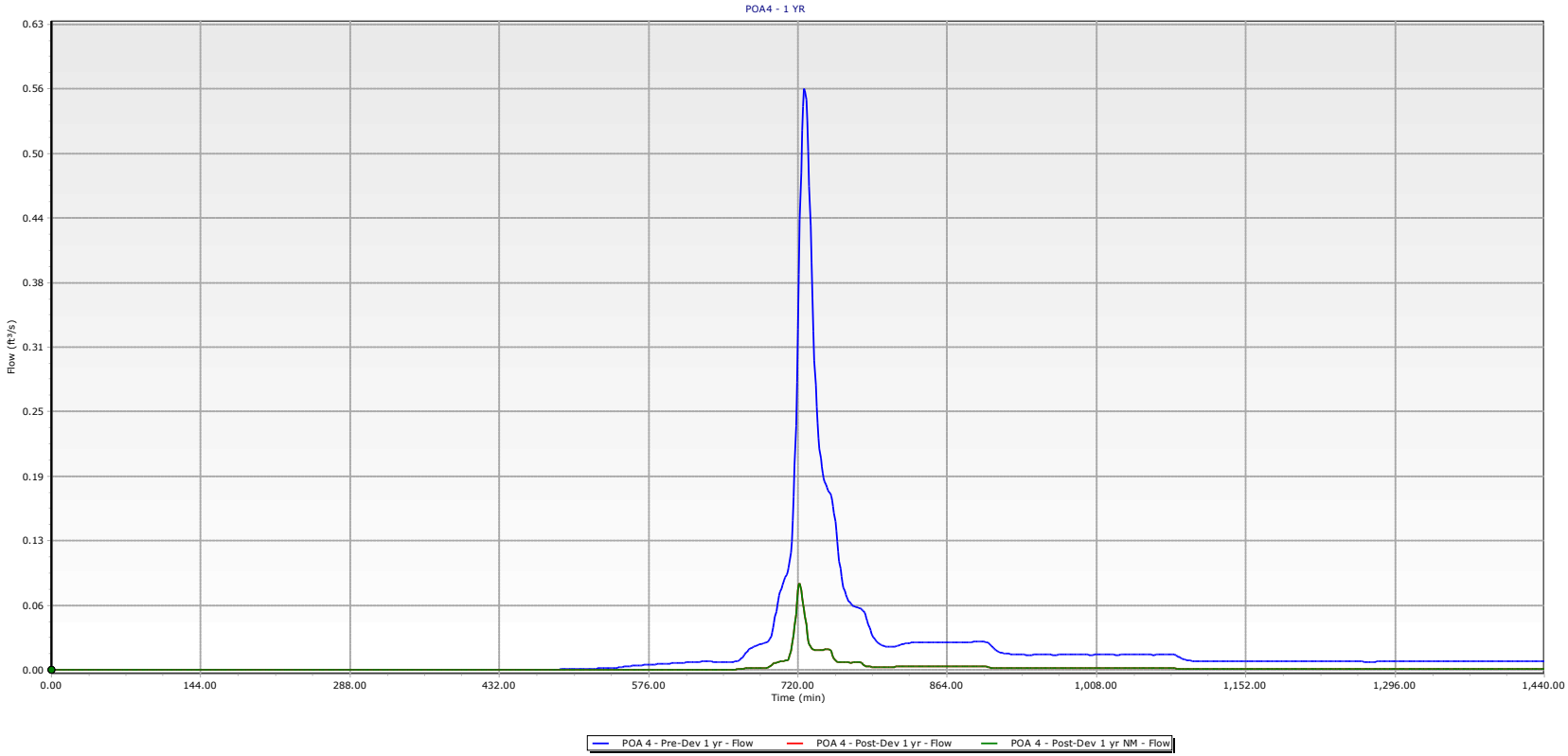

POA3 - 1 YR
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 3 - Pre-Dev 1 yr - Flow
POA 3 - Post-Dev 1 yr - Flow
POA 3 - Post-Dev 1 yr NM - Flow

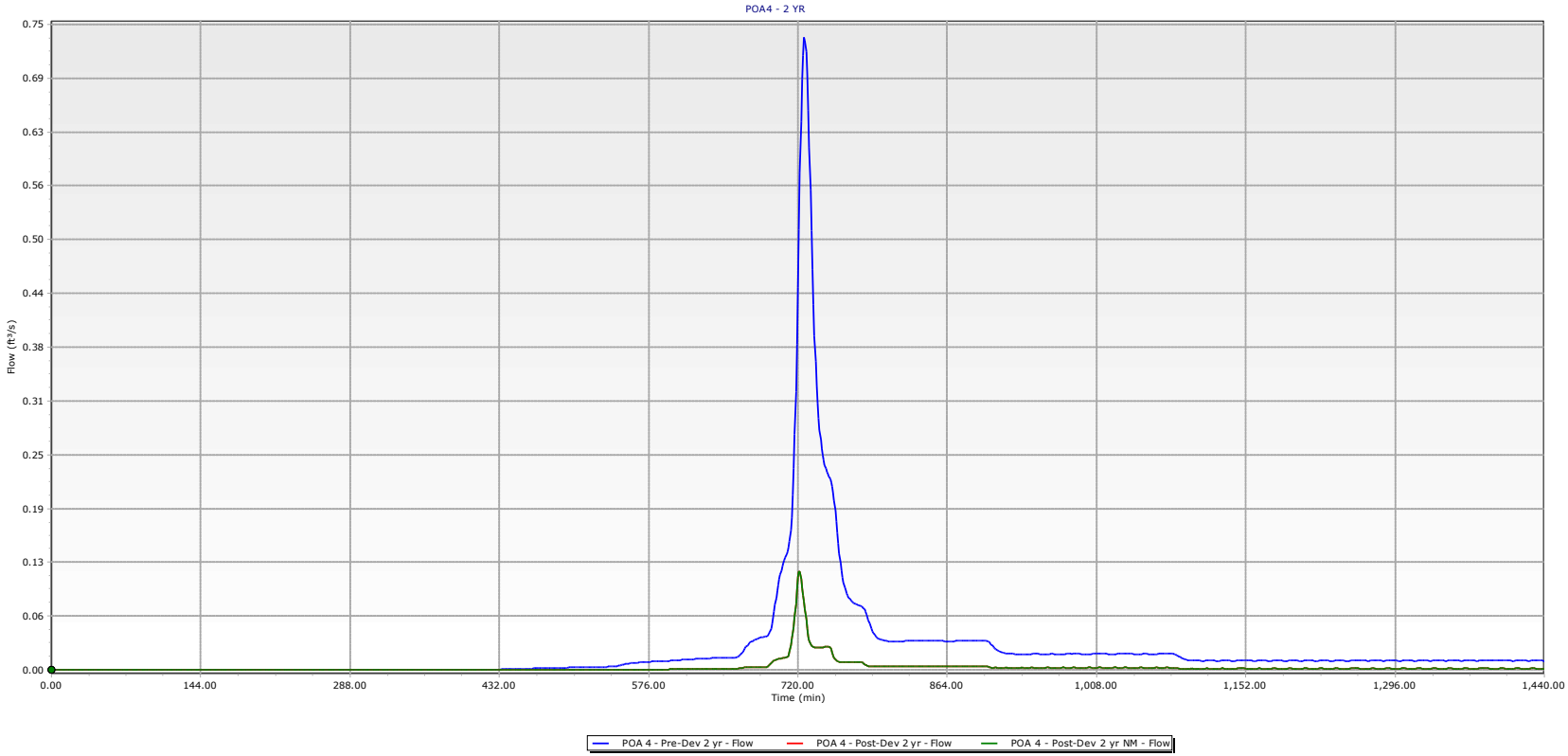

POA3 - 2 YR
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 3 - Pre-Dev 2 yr - Flow
POA 3 - Post-Dev 2 yr - Flow
POA 3 - Post-Dev 2 yr NM - Flow

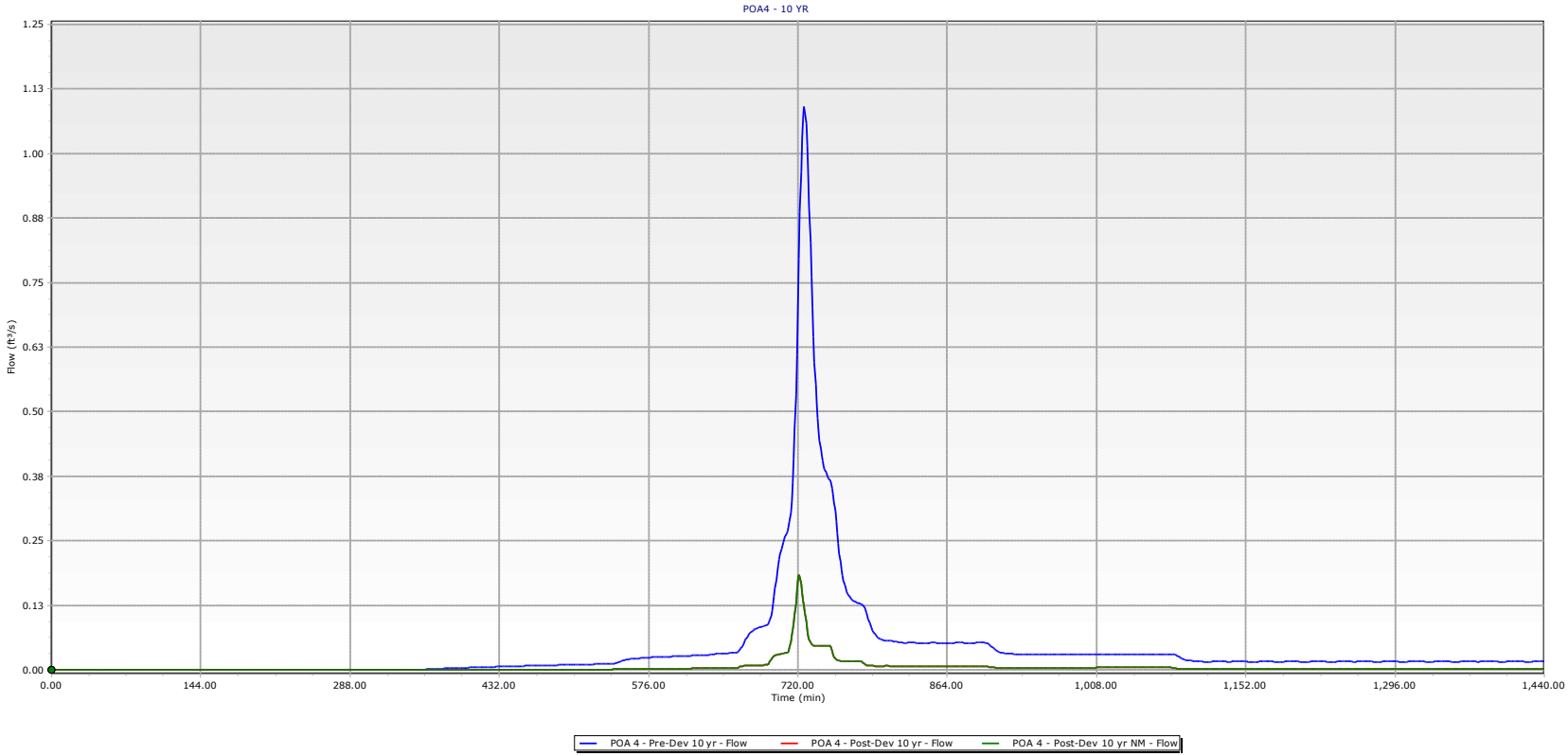

POA3 - 10 YR
8.75
7.50
6.25
5.00
3.75
2.50
1.25
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 3 - Pre-Dev 10 yr - Flow
POA 3 - Post-Dev 10 yr - Flow
POA 3 - Post-Dev 10 yr NM - Flow

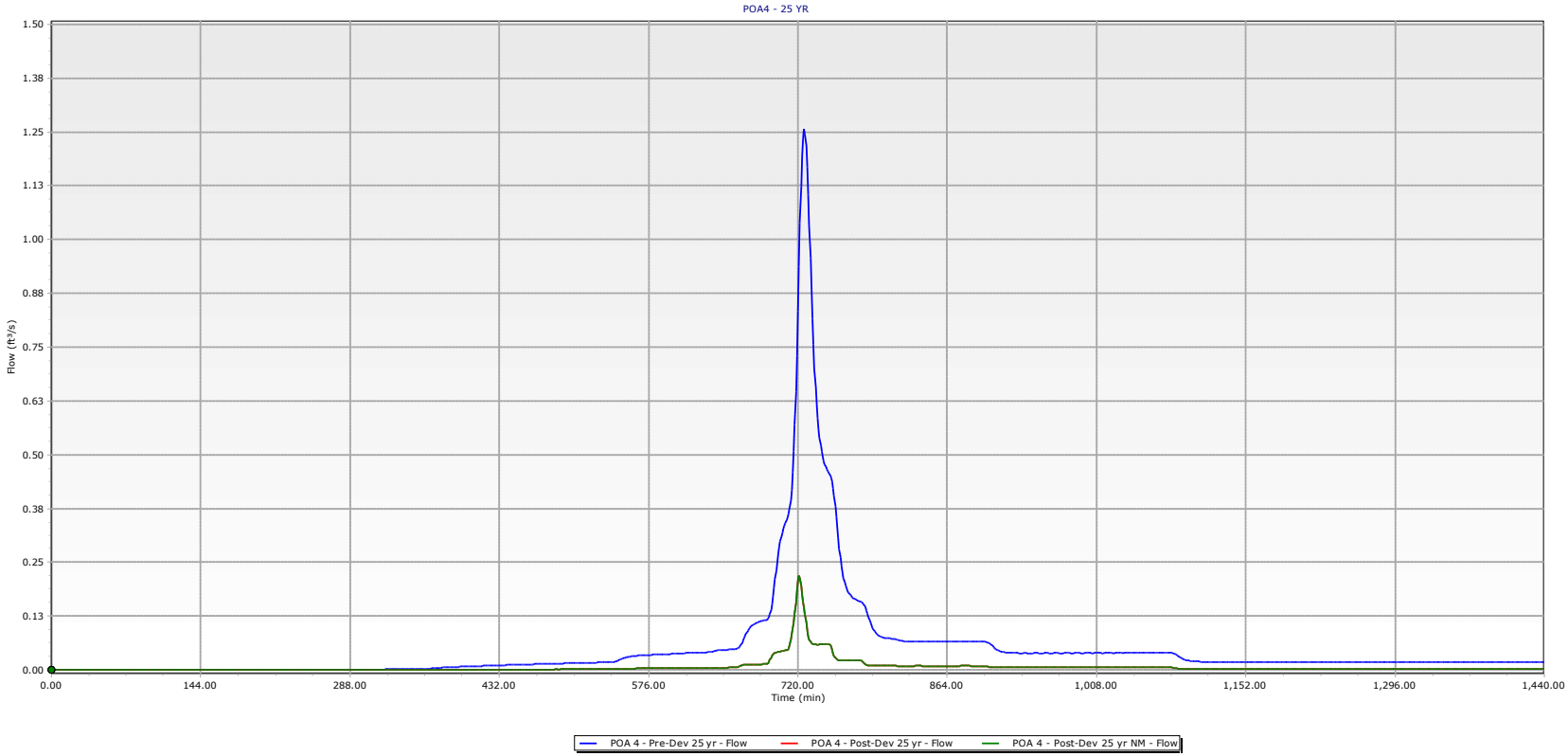

POA3 - 25 YR
10.00
8.75
7.50
6.25
5.00
3.75
2.50
1.25
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 3 - Pre-Dev 25 yr - Flow
POA 3 - Post-Dev 25 yr - Flow
POA 3 - Post-Dev 25 yr NM - Flow

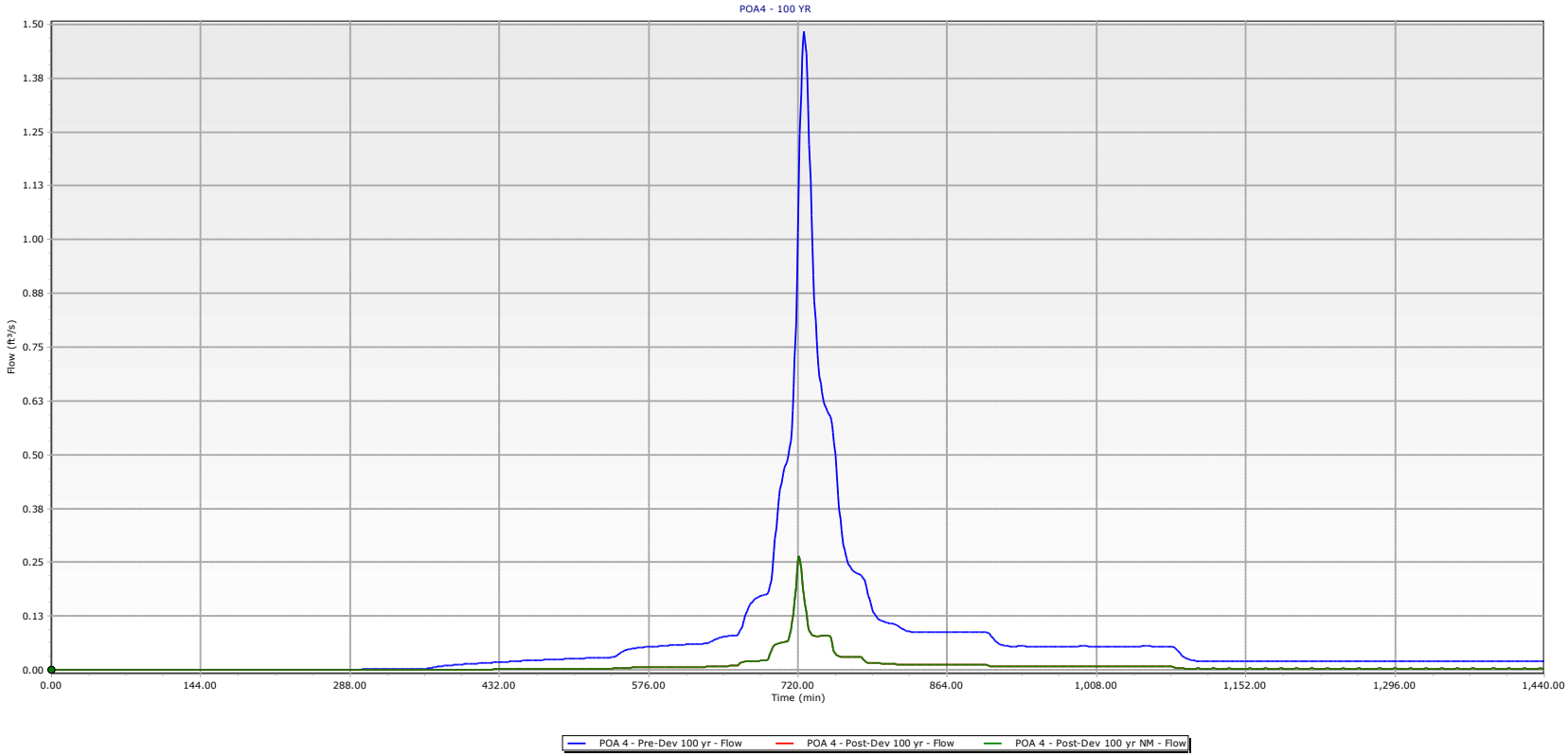

POA3 - 100 YR
12.50
11.25
10.00
8.75
7.50
6.25
5.00
3.75
2.50
1.25
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 3 - Pre-Dev 100 yr - Flow
POA 3 - Post-Dev 100 yr - Flow
POA 3 - Post-Dev 100 yr NM - Flow


POA4 - 1 YR
0.63
0.56
0.50
0.44
0.38
0.31
0.25
0.19
0.13
0.06
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 4 - Pre-Dev 1 yr - Flow
POA 4 - Post-Dev 1 yr - Flow
POA 4 - Post-Dev 1 yr NM - Flow


POA4 - 2 YR
0.75
0.69
0.63
0.56
0.50
0.44
0.38
0.31
0.25
0.19
0.13
0.06
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 4 - Pre-Dev 2 yr - Flow
POA 4 - Post-Dev 2 yr - Flow
POA 4 - Post-Dev 2 yr NM - Flow


POA4 - 10 YR
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
Flow (ft³/s)
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 4 - Pre-Dev 10 yr - Flow
POA 4 - Post-Dev 10 yr - Flow
POA 4 - Post-Dev 10 yr NM - Flow


POA4 - 25 YR
Flow (ft³/s)
1.50
1.38
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 4 - Pre-Dev 25 yr - Flow
POA 4 - Post-Dev 25 yr - Flow
POA 4 - Post-Dev 25 yr NM - Flow


POA4 - 100 YR
Flow (ft³/s)
1.50
1.38
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
0.00
144.00
288.00
432.00
576.00
720.00
864.00
1,008.00
1,152.00
1,296.00
1,440.00
Time (min)
POA 4 - Pre-Dev 100 yr - Flow
POA 4 - Post-Dev 100 yr - Flow
POA 4 - Post-Dev 100 yr NM - Flow

NUTRIENT LOADING CALCULATIONS

BARBEE CHAPEL APARTMENTS

TLA-22001

Project Information

Yellow cells require data for PROJECT AREA RUNOFF and NUTRIENT TREATMENT calculations

Green cells require data for NUTRIENT TARGETS, BUYDOWN, & CREDIT/DEBIT calculations

Project Name:	Barbee Chapel Apartments	
Submission Date:		
Project Area (ft^2):	455,841	ft^2
Disturbed Area (ft^2):	455,841	ft^2
Development Land Use Type:	Multi-Family Residential	
Development Activity Type:	Development - New	
Designated Downtown Area?	no	
Project Location/Address:	Barbee Chapel Road	
County:	Durham	
Local Jurisdiction:	Chapel Hill	
Project Latitude Coordinates:	35.850978	N
Project Longitude Coordinates:	-78.836007	W
Precipitation Station:	Chapel Hill	
Physiographic Region:	Piedmont	
Nutrient Management Watershed:	Jordan Lake	
Subwatershed:	Jordan - Upper New Hope	
Phosphorus Delivery Zone:	Jordan - 060080	
Nitrogen Delivery Zone:	Jordan - 060080	
Project Designer and Contact Phone Number / Email:	Maria Torres, PE torres@mcadamsco.com	
Part of Common Development Plan?	no	
Project Owner Type:	Private	
Project Description:		

PROJECT AREA LAND COVERS	TN EMC (mg/L)	TP EMC (mg/L)	Pre-Project Area (ft^2)	Post-Project Area (ft^2)
Roof	1.18	0.11	24,391	107,193
Roadway	1.64	0.34	18,322	0
Parking/Driveway/Sidewalk	1.42	0.18	30,984	231,856
Protected Forest	0.97	0.03	239,603	0
Other Pervious/Landscaping	2.48	1.07	142,541	116,792
CUSTOM LAND COVER 1				
CUSTOM LAND COVER 2				
CUSTOM LAND COVER 3				
LAND TAKEN UP BY SCM	1.18	0.11		

LAND COVER AREA CHECK

Net Change of Land Covers (ft^2):	**283,674**
Total Project Area Entered (ft^2):	**455,841**
Total Pre-Project Calculated Area (ft^2):	**455,841**
Total Post-Project Calculated Area (ft^2):	**455,841**

Equations Used and Project Area Calculations

SIMPLE METHOD

Runoff Coefficient, R_v

R_v = 0.05 + (0.009 *I)

where I = percent impervious (%)

Average Annual Pollutant Load, L

$L = (P_j * R_v * (P/12)) * (C * A * 2.72)$

where C = event mean concentration (mg/L)

Stormwater Runoff Volume Generated, V

$V = P_j * Rv * (P/12) * A$

where A = drainage area (ft^2)

P_j = fraction of rain events with runoff

P = average annual rainfall depth (in)

Pre-Project:		**Post-Project:**	
A = **10.4647**	ac	A = **10.4647**	ac
P = **47.31**	in.	P = **47.31**	in.
V = **316218**	ft^3	V = **1163599**	ft^3
I = **16%**		I = **74%**	
R_v = **0.20**		R_v = **0.72**	
P_j = **0.9**		P_j = **0.9**	
C_{TN} = **1.42**	mg/L	C_{TN} = **1.36**	mg/L
C_{TP} = **0.24**	mg/L	C_{TP} = **0.17**	mg/L
L_{TN} = **28.13**	lb/yr	L_{TN} = **99.13**	lb/yr
L_{TP} = **4.82**	lb/yr	L_{TP} = **12.65**	lb/yr

Catchment ID	1	1	1
SCM ID	101	102	103
Type of SCM	Sand Filter per MDC - Closed	Sand Filter per MDC - Closed	
Predominant hydrologic soil group at SCM location	D	D	
SCM Description			
Design Storm Size (inches/24hrs)			
Percent of Full Size	100%	100%	
Hydrologic Value - Percent Annual Effluent	90%	90%	
Hydrologic Value - Percent Annual Overflow	10%	10%	
Hydrologic Value - Percent Annual ET/Infiltrated	0%	0%	
SCM Effluent TP EMC (mg/L)	0.12	0.12	
SCM Effluent TN EMC (mg/L)	1.20	1.20	
SCM Land Cover TP EMC (mg/L)	0.11	0.11	
SCM Land Cover TN EMC (mg/L)	1.18	1.18	
Drains to SCM ID	102	0	
Catchment Routing (Source Catchment)	Catchments Draining to SCM 101	Catchments Draining to SCM 102	Catchments Draining to SCM 103
Catchment 1			
Catchment 2			
Catchment 3			
Catchment 4			
Catchment 5			
Catchment 6			

SCM ID:	101	102	103			
SCM Drainage Area Land Covers	Area Draining Directly to SCM 101 (ft2)	Area Draining Directly to SCM 102 (ft2)	Area Draining Directly to SCM 103 (ft2)	Total Land Use Area Treated By All SCMs (ft^2)	Allowable Total Land Use Area to be Treated Based on Post-Project Areas (ft^2)	Post-Project Untreated Land Area (ft^2)
Roof	29,664	77,529		107,193	107,193	0
Roadway	0	0		0	0	0
Parking/Driveway/Sidewalk	64,749	148,719		213,468	231,856	18,388
Protected Forest	0	0		0	0	0
Other Pervious/Landscaping	23,682	44,618		68,300	116,792	48,492
CUSTOM LAND COVER 1				0	0	0
CUSTOM LAND COVER 2				0	0	0
CUSTOM LAND COVER 3				0	0	0
LAND TAKEN UP BY SCM				0	0	0
TOTAL AREA DRAINING TO SCM (ft^2):	**118,095**	**270,866**	**0**	**388,961**	**455,841**	**66,880**
CATCHMENT AREA (ft^2):	**388,961**					

Project Summary

Project Name:	Barbee Chapel Apartments				
Project Area (ft^2):	455,841 **ft^2**	10.4647 **acres**	**Submission Date:**		
Disturbed Area (ft^2):	455,841 **ft^2**	10.4647 **acres**			
County:	Durham	**Local Jurisdiction:**	Chapel Hill		
Development Land Use Type:	Multi-Family Residential	**Owner Type:**	Private		
Development Activity Type:	Development - New	**Designated Downtown Area?**	no		
Nutrient Management Watershed:	Jordan Lake	**Subwatershed:**	Jordan - Upper New Hope		
Phosphorus Delivery Zone:	Jordan - 060080	**Nitrogen Delivery Zone:**	Jordan - 060080		
Phosphorus Delivery Factor (%):	45%	**Nitrogen Delivery Factor (%):**	59%		
Phosphorus Loading Rate Target (lb/ac/yr):	*0.82*	***Nitrogen Loading Rate Target (lb/ac/yr):***	*2.20*		
Phosphorus Load Target at Site (lb/yr):	**8.58**	**Nitrogen Load Target at Site (lb/yr):**	**23.02**		
Phosphorus Load Leaving Site w/SCMs (lb/yr):	**9.68**	**Nitrogen Load Leaving Site w/SCMs (lb/yr):**	**89.32**		
P Offsite Buy-Down Threshold Loading Rate (lb/ac/yr):	0.93	**N Offsite Buy-Down Threshold Loading Rate**	10.00		
Total P Load Reduction Needed (lb/yr):	4.07	**Total N Load Reduction Needed (lb/yr):**	76.11		
P Load Treatment Balance at Site (lb/yr):	1.10	**N Load Treatment Balance at Site (lb/yr):**	66.30		
P Load Treatment Balance at Lake (lb/yr):	0.50	**N Load Treatment Balance at Lake (lb/yr):**	39.12		

Nutrient Export Summary

	Pre-Project Whole Site Conditions	**Post-Project Whole Site without SCMs**	**Post-Project Whole Site with SCMs**	**Post-Project SCM-Treated Area**	**Post-Project Untreated Area**
Percent Impervious (for runoff calculation) (%)	16.2%	74.4%	74.4%	82.4%	27.5%
Percent Built-Upon Area (BUA) (%)	16.2%	74.4%	74.4%	82.4%	27.5%
Annual Runoff Volume (ft^3/yr)	316,218	1,163,599	1,163,599	1,093,013	70,586
Annual Runoff % Change (relative to pre-D)	0%	268%	268%		
Total Nitrogen EMC (mg/L)	1.42	1.36	1.23	1.21	1.55
Total Nitrogen Load Leaving Site (lb/yr)	**28.13**	**99.13**	**89.32**	82.50	6.83
Total Nitrogen Loading Rate (lb/ac/yr)	*2.69*	*9.47*	*8.54*	*9.24*	*4.45*
Total Nitrogen % Change (relative to pre-D)	0%	252%	217%		
Total Phosphorus EMC (mg/L)	0.24	0.17	0.13	0.12	0.29
Total Phosphorus Load Leaving Site (lb/yr)	**4.82**	**12.65**	**9.68**	8.41	1.27
Total Phosphorus Loading Rate (lb/ac/yr)	*0.46*	*1.21*	*0.93*	*0.94*	*0.83*
Total Phosphorus % Change (relative to pre-D)	0%	163%	101%		

SCM/Catchment Summary

SCM ID and Type	Volume Reduction (%)	TN Out (mg/L)	TP Out (mg/L)	*TN Out (lbs/ac/yr)*	*TP Out (lbs/ac/yr)*	TN Reduction (%)	TP Reduction (%)
Catchment 1	0.00%	1.21	0.12	*9.24*	*0.94*	10.60%	26.08%
101: Sand Filter per MDC - Closed	0.00%	1.22	0.13	*9.01*	*0.93*	10.69%	26.45%
102: Sand Filter per MDC - Closed	0.00%	1.21	0.12	*9.24*	*0.94*	7.68%	19.69%
103: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
Catchment 2	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
201: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
202: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
203: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
Catchment 3	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
301: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
302: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
303: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
Catchment 4	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
401: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
402: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
403: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
Catchment 5	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
501: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
502: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
503: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
Catchment 6	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
601: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
602: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%
603: NA	0.00%	0.00	0.00	*0.00*	*0.00*	0.00%	0.00%

SCM rows in red have a data entry error for the SCM that makes an error in the calculation.

Nutrient Management Strategy Watershed - Nutrient Offset Credit Reporting Form

Please complete and submit the following information to the local government permitting your development project to characterize it and assess the need to purchase nutrient offset credits. Contact and rule implementation information can be found online at:

http://deq.nc.gov/about/divisions/water-resources/planning/nonpoint-source-management/nutrient-offset-information

PROJECT INFORMATION

Applicant Name:	Toll Brothers Apartment Living				
Project Name:	Barbee Chapel Apartments				
Project Address:	Barbee Chapel Road				
Date: *(mm/dd/yyyy)*	11/17/2022	**Development Land Use Type:**		Multi-Family Residential	
County:	Durham	**Development Activity Type:**		Development - New	
Pre-Project Built-Upon Area %:		16.17%	**Project Latitude:**		35.850978
Post-Project Built-Upon Area %:		74.38%	**Project Longitude:**		-78.836007

WATERSHED INFORMATION

Nutrient Management Watershed:	Jordan Lake	**N Offsite Threshold Rate (lb/ac/yr):**	10.00
Subwatershed:	Jordan - Upper New Hope	**P Offsite Threshold Rate (lb/ac/yr):**	0.93
Nitrogen Delivery Zone:	Jordan - 060080	**Nitrogen Delivery Factor:**	59%
Phosphorus Delivery Zone:	Jordan - 060080	**Phosphorus Delivery Factor:**	45%

NUTRIENT OFFSET REQUEST

Nitrogen Load Offset Needs

(A) Untreated Loading Rate (lbs/ac/yr)	(B) Treated Loading Rate (lbs/ac/yr)	(C) Loading Rate Target (lbs/ac/yr)	(D) Reduction Need (lbs/ac/yr) B - C	(E) Project Size (ac)	(F) Offset Duration (yrs)	(G) Delivery Factor (%)	(H) State Buy Down Amount (lbs) D * E * F * G	*(L) (Where Applicable)* Local Gov't Buy Down Amount (lbs)
9.47	8.54	2.20	6.34	10.4647	30	59%	**1173.51**	

Phosphorus Load Offset Needs

(A) Untreated Load Rate (lbs/ac/yr)	(B) Treated Load Rate (lbs/ac/yr)	(C) Loading Rate Target (lbs/ac/yr)	(D) Reduction Need (lbs/ac/yr) B - C	(E) Project Size (ac)	(F) Offset Duration (yrs)	(G) Delivery Factor (%)	(H) State Buy Down Amount (lbs) D * E * F * G	*(L) (Where Applicable)* Local Gov't Buy Down Amount (lbs)
1.21	0.93	0.82	0.11	10.4647	30	45%	**14.85**	

LOCAL GOVERNMENT AUTHORIZATION

Local Government Name:	Chapel Hill		
Staff Name:		**Phone:**	
Staff Email:		**Date:**	
Local Government Authorizing Signature:			