

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

Section A: Project Information

Parcel Identifier Number (PIN): 9788962765 Date: Submitted 6/14/2021
Revised 10/06/2021
Revised 01/10/2022

Project Name: Gimghoul Castle

Property Address: 742 Gimghoul Road Zip Code: 27515

Use Groups (A, B, and/or C): B Existing Zoning District: R-1; HD-3

Project Description: Rezoning to OI-1 CZD; modernizing renovations and additions to Gimghoul Castle.

Applicant Information (to whom correspondence will be mailed):

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

Name: Gimghoul Corporation

Address: c/o John Bratton, Wake Stone Corp., P.O. Box 190

City: Knightdale State: NC Zip Code: 27545

Phone: (919) 819-7494 Email: johnrbratton@wakestonecorp.com

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

Signature: [Handwritten Signature] Date: Jan 10 2022

Owner/Contract Purchaser Information:

Owner Contract Purchaser

Name: Gimghoul Corporation

Address: P.O. Box 3670

City: Chapel Hill State: NC Zip Code: 27515

Phone: (919) 819-7494 Email: johnrbratton@wakestonecorp.com

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

Signature: [Handwritten Signature] Date: Jan 10 2022



CONDITIONAL ZONING

TOWN OF CHAPEL HILL
Planning Department

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: OI-1 CZD - club, single family and offsite parking

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=	93,849	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=		sq. ft.
	b) Credited Permanent Open Space (total adjacent frontage) x ½ public or dedicated open space	COS=	9,385	sq. ft.
TOTAL: NLA + CSA and/or COS = Gross Land Area (not to exceed NLA + 10%)		GLA=	103,234	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)	18,500
Area of Land Disturbance within RCD	0
Area of Land Disturbance within Jordan Buffer	0

Impervious Areas	Existing (sq. ft.)	Demolition (sq. ft.)	Proposed (sq. ft.)	Total (sq. ft.)
Impervious Surface Area (ISA)	24,602	596	4,298	28,304
Impervious Surface Ratio: Percent Impervious Surface Area of Gross Land Area (ISA/GLA)%	23.81%	0.57%	4.16%	27.41%
If located in Watershed Protection District, % of impervious surface on 7/1/1993	23.81%			



Section D: Dimensions

Dimensional Unit (sq. ft.)	Existing (sq. ft.)	Demolition (sq. ft.)	Proposed (sq. ft.)	Total (sq. ft.)
Number of Buildings	1			1
Number of Floors	3			3
Recreational Space	N/A			

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)				
Total Square Footage of All Units				
Total Square Footage of Affordable Units				
Total Residential Density				
Number of Dwelling Units				
Number of Affordable Dwelling Units				
Number of Single Bedroom Units				
Number of Two Bedroom Units				
Number of Three Bedroom Units				

Non-Residential Space (Gross Floor Area in Square Feet)					
Use Type	Existing	Proposed	Uses	Existing	Proposed
Commercial					
Restaurant			# of Seats		
Government					
Institutional					
Medical					
Office					
Hotel			# of Rooms		
Industrial					
Place of Worship			# of Seats		
Other	5,055	1,200			

Dimensional Requirements		Required by Ordinance	Existing	Proposed
Setbacks (minimum)	Street	24'	365'	365'
	Interior (neighboring property lines)	8'	97'	97'
	Solar (northern property line)	11'	108'	108'
Height (maximum)	Primary	29'		---
	Secondary	60'		---
Streets	Frontages	40'	50'	50'
	Widths		Varies	Varies



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
Gimghoul Road	50'	Varies	2	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
				<input type="checkbox"/> Yes	<input type="checkbox"/> 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
N/A			<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
			<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A

Section G: Parking Information

Parking Spaces	Minimum	Maximum	Proposed
Regular Spaces	None	None	20
Handicap Spaces	None	None	1
Total Spaces	None	None	21
Loading Spaces	None	None	N/A
Bicycle Spaces	None	None	4
Surface Type	Gravel		

Section H: Landscape Buffers

Location (North, South, Street, Etc.)	Minimum Width	Proposed Width	Alternate Buffer	Modify Buffer
North	10'	10'	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes
Eastern Property Lines	10'	10'	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes
Western Property Lines	10'	10'	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes
Southern Property Lines	10'	10'	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> 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
01-1 CZD	.264	N/A			72,263	27,253	N/A
TOTAL							
RCD Streamside	0	0.01					
RCD Managed	0	0.019					
RCD Upland	0						

Section J: Utility Service

Check all that apply:

Water	<input checked="" type="checkbox"/> OWASA	<input type="checkbox"/> Individual Well	<input type="checkbox"/> Community Well	<input type="checkbox"/> Other
Sewer	<input checked="" type="checkbox"/> OWASA	<input type="checkbox"/> Individual Septic Tank	<input type="checkbox"/> Community Package Plant	<input type="checkbox"/> Other
Electrical	<input checked="" type="checkbox"/> Underground	<input checked="" type="checkbox"/> Above Ground		
Telephone	<input type="checkbox"/> Underground	<input checked="" type="checkbox"/> Above Ground		
Solid Waste	<input checked="" type="checkbox"/> Town	<input type="checkbox"/> 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 \$	<input type="text"/>
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		
N/A	Traffic Impact Statement – completed by Town’s consultant (or exemption)		
N/A	Description of Public Art Proposal , if applicable		
X	Statement of Justification		
---	Response to Community Design Commission and Town Council Concept Plan comments , if applicable		
---	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 \$	<input type="text"/>
X	Written Narrative describing the proposal, including proposed land uses and proposed conditions		
N/A	Resource Conservation District, Floodplain, & Jordan Buffers Determination – necessary for all submittals		
N/A	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



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Planning and Development Services**

- 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



**CONDITIONAL ZONING APPLICATION
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TOWN OF CHAPEL HILL
Planning and Development Services**

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



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Planning and Development Services**

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



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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)

STATEMENT OF JUSTIFICATION FOR REZONING FROM R-1, HD-3 TO OI-1 CZD

Introduction/Background.

Gimghoul Corporation owns a 2.15-acre tract at 742 Gimghoul Road. Gimghoul Castle is on the tract. Constructed in 1926, the Castle is listed on the National Register of Historic Places and has been used by the Order of Gimghoul, a collegiate society founded in 1889 and headquartered at the Castle, for 95 years. The Order sold approximately 35 acres of property to finance the construction of the Castle. Those acres became the Gimghoul Neighborhood, one of Chapel Hill's three historic districts. The Castle is at the end of Gimghoul Road.

The Order has determined it needs to construct accessible bathrooms and add features to bring accessibility to the Castle. After designing the improvements and submitting the proposal to the Historic District Commission for concept plan review (which was favorable), Gimghoul Corporation learned they could not proceed with their proposed renovations because the Castle property is zoned R-1 and their 95-year club use is considered a non-conforming use under Chapel Hill's Land Use Management Ordinance ("LUMO"). After consultation with Town of Chapel Hill Planning Staff, Gimghoul Corporation determined the appropriate means to address this issue is to seek a rezoning to make the use in place since 1926 conforming. Using the conditional zoning tool, the uses proposed follow the actual and historic use. No other uses are sought.

Gimghoul Corporation applied for a Certificate of Appropriateness for the modifications sought in the event the conditional rezoning is granted. A Certificate of Appropriateness was granted by the Historic District Commission for this modernization project on April 13, 2021.

Justification for Rezoning Requests.

Under current zoning, Gimghoul Corporation's use of the Castle property in the way it has been used historically is non-conforming. While Gimghoul Corporation could develop the property for residential use in the R-1 zone, it cannot modernize its facility without a zoning amendment. Gimghoul Corporation is not sure when the property was zoned R-1. It appears from the zoning map that the property is simply included in the general residential zoning for the adjoining Gimghoul Neighborhood. We do not believe it was the intent of the Town of Chapel Hill to make Gimghoul Castle a non-conforming use or for it to be zoned in a way that does not allow its continued historic use.

This is a request for a conditional zoning under Section 4.4.1(c) of LUMO to OI-1 CZD. This application is being made by the owner of all the property in the area proposed to be rezoned. The request includes a request to limit the uses allowed to the club use, accessory residential use (to allow for a caretaker's apartment inside the Castle) and off-street parking.

The Town Council's decision on a rezoning is based on these criteria:

- a. The conformity of the application with the applicable provisions of LUMO and the Town Code,
- b. The conformity of the application with the comprehensive plan,
- c. The compatibility of the proposed application with adjoining uses,
- d. The impacts of the proposed application on the surrounding properties and Town as a whole,
- e. The relationship of the application to existing and proposed built systems including utility infrastructure, transportation facilities, police and fire coverage and other public services and facilities, and
- f. The relationship of the application to natural systems such as hydrology, topography, and other environmental constraints.

Conformity of Application with the Applicable Provisions of the Land Use Management Ordinance and Town Code.

Gimghoul Corporation proposes to continue using the property as it has been used since the Castle was built in 1926. The uses proposed are limited to existing club use, an accessory living opportunity (for a caretaker) and use of off-street parking. Because the caretaker's apartment is within the Castle and included in the total square footage of the Castle, its dimensions are included in the overall existing building dimensions and not as a separate entry on the Project Fact Sheet. Gimghoul Corporation believes the Castle has had a caretaker in residence for at least seventy years.

Conformity of the Application with the Comprehensive Plan.

Chapel Hill 2020 Comprehensive Plan notes at page 13, "[t]hroughout its history and continuing today, Chapel Hill has retained its small-town friendliness; its sense of place in historic roots; evidence of care for the natural environment; the thoughtful integration of commercial areas with the fabric of the Town; and the youthful exuberance and interchange of ideas that are fostered by the University."

Gimghoul Castle is a deep historic root of the Town of Chapel Hill and provides, particularly for the Gimghoul Historic District, a sense of place. The attention by Gimghoul Corporation to the natural environment surrounding the Castle and their having deeded land to the

University of North Carolina to maintain the natural area around the Castle are evidence of care for the natural environment. The Castle is the essence of the outcome of youthful exuberance as it was developed by a group of students with foresight that has allowed it to exist for almost 100 years. Allowing the long-term preservation of the Castle meets one of the Comprehensive Plan themes of good places, new spaces for balancing respect for the old (p. 27). Conditional zoning to allow the Castle to continue as a conforming use promotes the Castle's continued care and assures this historic landmark will be maintained.

Compatibility of the Proposed Application with Adjoining Uses.

The proposed conditional zone is limited to the three existing uses of Gimghoul Castle. The Castle has been compatible with the Gimghoul Neighborhood throughout its history and the proposed conditional rezoning simply makes the uses that have been compatible conforming. Therefore, this criterion is met.

Impacts of the Proposed Application on the Surrounding Properties and the Town as a Whole.

The proposed conditional zoning simply brings Gimghoul Castle's underlying zoning into conformity with its use. The conditional use proposed is limited to the existing historic uses of the Castle. The applicant does not believe the Town intends for the historic use of the Castle to end and for it to be replaced with single-family housing. The application's impact on the surrounding properties and the Town as a whole is to maintain the historic Gimghoul Castle and to allow the Order to provide accessibility features and otherwise engage in activities that will assure the longevity of this historic structure. The renovations proposed by the Order have no impact on surrounding properties or on the Town as a whole and have been approved by the Historic District Commission as congruous with the Gimghoul Historic District.

The Relationship of the Application to Existing and Proposed Built Systems Including Utility Infrastructure, Transportation Facilities, Police and Fire Coverage and Other Public Service Facilities.

The relationship of the Gimghoul Castle property to existing and proposed built systems is not affected or changed. The proposed renovations to the Castle and will not place additional burdens on the existing or proposed built systems including utility infrastructure, transportation facilities, police and fire coverage, and other public services and facilities. The proposed renovations will make the Castle a safer place for visitors. Annually, the Order allows the Gimghoul Neighborhood to use the Castle property for a neighborhood meeting. The renovations proposed will allow access to restroom facilities to those visitors to the outside of the Castle property. The proposal does not affect the relationship of the property to existing and proposed built systems.

Included with the application is an email from Kumar Neppalli confirming that the property does not need a TIA exemption because the proposal does not generate enough vehicle trips to have impact.

The Relationship of the Application to Natural Systems Such as Hydrology, Topography, and Other Environmental Constraints.

The relationship of the property to natural systems will not be affected by the proposed conditional zoning. The conditional zoning simply brings into zoning compliance uses that have been in effect for 100 years. The Castle is already in existence and the proposal does not change its relationship to natural systems. Applicant has provided a Stormwater Impact Statement as part of its application.

Based on this analysis and the proposed conditional zoning from R-1, HD-3 to OI-1 CZD, limited to club use, accessory residential and off-street parking, meets all criteria for approval described in Section 4.4.3(f)(2) of LUMO.

Written Narrative Describing the Proposal Including Proposed Land Uses and Conditions.

The applicant proposes this property at 742 Gimghoul Road be rezoned from R-1, HD-3 to OI-1 CZD. It proposes these conditions:

1. That the uses allowed in the OI-1 CZD zone are:
 - club use,
 - accessory residential use,
 - off-street parking.
2. That the dimensional requirements in the OI-1 CZD's zone will be those identified in the Project Fact Sheet.
3. That the parking requirements in this OI-1 CZD zone reflect the current parking at Gimghoul Castle plus the addition of a 4 bicycle rack under the information provided in the Project Fact Sheet and as shown on the attached Gimghoul site plan.
4. That the landscape buffers provided be as identified in the Project Fact Sheet.
5. That the floor area ratios, parking ratios, impervious surface ratios and other applicable restrictions reflect the size of the existing parcel to accommodate a future change if needed.

LeAnn Nease Brown

From: Kumar Neppalli <kneppalli@townofchapelhill.org>
Sent: Monday, April 26, 2021 11:18 AM
To: LeAnn Nease Brown
Cc: Judy Johnson; Anya Grahn
Subject: Re: Location for Conditional Zoning from R1 and HD3 to OI-CZD for Gimghoul Corporation (Sent on Behalf of LeAnn Nease Brown)

Hi LeAnn,

You do not need a TIA exemption for this as it does not generate enough vehicle trips. I have copied this email to Anya and Judy. Thanks.

Kumar

On Apr 21, 2021, at 6:12 PM, LeAnn Nease Brown <lnease@brownandbunch.com> wrote:

External email: Don't click links or attachments from unknown senders. To check or report forward to reportspam@townofchapelhill.org Good evening Kumar,

I am following up on my email below regarding an exemption of a Traffic Impact Analysis. I look forward to hearing from you.

Best,
LeAnn

LeAnn Nease Brown
Brown & Bunch, PLLC
101 North Columbia Street
Chapel Hill, NC 27514
telephone: (919) 968-1111, ext. 141
telefax: (919) 968-1444
lnease@brownandbunch.com<<mailto:lnease@brownandbunch.com>>

From: Marlene Lang <mlang@brownandbunch.com>
Sent: Monday, April 5, 2021 1:57 PM
To: kneppalli@townofchapelhill.org
Cc: jjohnson@townofchapelhill.org; agrahn@townofchapelhill.org; LeAnn Nease Brown <lnease@brownandbunch.com>
Subject: Location for Conditional Zoning from R1 and HD3 to OI-CZD for Gimghoul Corporation (Sent on Behalf of LeAnn Nease Brown)

April 5, 2021

via email, kneppalli@townofchapelhill.org<<mailto:kneppalli@townofchapelhill.org>>

Kumar Neppalli, Traffic Engineering Manager

Public Works Department

Town of Chapel Hill

405 Martin Luther King Drive

Chapel Hill, NC 27514

Re: Location for Conditional Zoning from R1 and HD3 to
OI-CZD for Gimghoul Corporation

Dear Kumar:

I am following up on Anya Grahn's email of March 10. Our firm represents Gimghoul Corporation, the owner of a parcel of property at 742 Gimghoul Road in Chapel Hill. Since the 1920s, the property has been used as a club but current zoning does not reflect the actual and historic use. Gimghoul Corporation learned about the current zoning when it began the process of applying to make revisions to the property, the majority of which are to improve accessibility. After meeting with Judy Johnson and Anya Grahn, we determined the best course of action is to seek a conditional zoning to make the current club use conforming. The uses Gimghoul Corporation will seek with the OI-CZD are club use, single-family use (because there is a caretaker on site) and off-street parking.

Because the use to be sought is already in place and because the changes proposed do not increase existing utilization, I am writing to seek an exemption to the traffic impact analysis requirement in connection with the conditional zoning application.

Please let me know next steps to seek the exemption.

Best regards.

Sincerely,

BROWN & BUNCH, PLLC

LeAnn Nease Brown

LNB/mjl

13624\01\026Neppalli

cc: Judy Johnson (via email, jjohnson@townofchapelhill.org)

Anya Grahn (via email, agrahn@townofchapelhill.org<<mailto:agrahn@townofchapelhill.org>>)

John Bratton (via email)

LeAnn Nease Brown
BROWN & BUNCH, PLLC
101 North Columbia Street
Chapel Hill, NC 27514
919.968.1111

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RWC INC. ROBERT WINSTON CARR, INC.
ASSOCIATED ARCHITECTS
P.O. BOX 1692 DURHAM, NORTH CAROLINA 27702
~~301 E CHAPEL HILL ST DURHAM, NORTH CAROLINA 27701~~

919/688-6308
FAX 919/682-0075
~~rwc.architects@frontier.com~~

carrarchitecture39@gmail.com
919.906.2496 J.C.

July 21, 2021

Re: Project: Additions & Renovations to...
Gimghoul Castle
Chapel Hill, North Carolina

Subject: Conditional Zoning Application
Energy Management Plan / Narrative

The Project... **Additions & Renovations to the Gimghoul Castle** consists of...

- A. a Main Level addition w/ Basement below that totals 1,180 sq. ft. of gross conditioned area. When built the new conditioned area will represent 19% of the total gross conditioned area of the Castle. The new area use will be M & F Toilets @ the Main Level w/ Misc.Storage area below.
- B. an extension of an existing (non conditioned) "open air" Loggia
- C. an ADA compliant sidewalk to access the existing upper Terrace and Castle
- D. a new exterior Lower Terrace to compliment and expand the Upper Terrace use
- E. internally... an improved Bathroom for the existing Resident Apartment
- F. internally... a renovated but reduced area Kitchen w/ new kitchen and laundry appliances

.....

The following, in like order, are responses to the two page, sixteen points provided by the Town of Chapel Hill, Office of Planning and Sustainability, *Guidance for Creating an Energy Management Plan, June 2017*. (copy attached)

1. The Project will be designed utilizing high efficient heat pump systems and LED lighting to achieve 20% better energy performance than AHSRAE 90.1 standard.
2. A green building standard is not being pursued due to the limited energy use

RWC INC.

predicted by this Project.

3. The Project addresses water conservation by utilizing low flow plumbing fixtures. The savings are expected to be >20%.

4. The Project is not proposing any sustainable or renewable energy products.

5. Transportation related energy consumption is not applicable to this Project.

6. The existing Castle is located in a large forested area of Chapel Hill. (Re: Gimghoul Historic District) The nature, location and size of the proposed addition is negligible if an attempt were to be made regarding its impact on... *urban heat island effect*... concerns.

7. Though minimal... the Project necessitates that a few existing trees be removed. The Castle will remain a stone edifice located within a large and heavily wooded setting. An irrigation system does not exist.

8. The unique Natural Site and Location causes no concerns (Re: negligible impact) w/ regard to life-cycle and transportation related energy consumption.

9. All light fixtures are specified w/ low consumption LED lamps. All fixtures will be controlled w/ occupancy sensors and photocells.

10. Lighting: Due to limited need new lighting is minimal. All planned new light fixtures will feature high efficiency LED bulbs. The new Castle addition features windows within the exterior walls which will allow natural daytime light into all newly created spaces. This includes the newly created Storage Basement.

11. The Castle addition consists of two Toilet Rooms and a Storage Basement below. Both types of spaces have exterior windows that will emit daytime natural light.

12. The exterior walls of the Castle addition consist of... 8 inch and 12 inch thk. natural stone; 8 inch and 12 inch thk. concrete masonry units; 1 inch thk. extruded rigid insulation; 4 inch thk. wd. studs w/ batt insulation; w/ either water resistant backer board for receiving a tile finish or ½ thk. plywd. to receive ¾ inch T&G pine or cypress boards. Few buildings (none) have a mass component as described.

The roof construction consists of 2 inch thk. T&G southern yellow pine w/ an average of 4 inches thk. sloped rigid insulation topped w/ a ½ inch thk. protection board and a 60 mil single ply roof membrane.

RWC INC.

The addition is a small rectangular box w/ limited window penetrations. The thermal design is performance based... not prescriptive.

13. The Castle addition will not utilize any exotic or distant / far away haul materials. All materials are locally sourced. Concrete; steel; wood; natural stone; tile; windows; etc... There is limited need for painting. Paints and or stains will be low VOC products.

14. The specified mechanical equipment will be > 24 SEER (Seasonal Energy Efficiency Ratio) and 13.5 HSPF (Heating Season Performance Factor).

P15. Occupied areas will have Carbon Monoxide sensors.

16. N/A This Project will not be phased for construction.

END

Town of Chapel Hill Guidance for Creating an Energy Management Plan

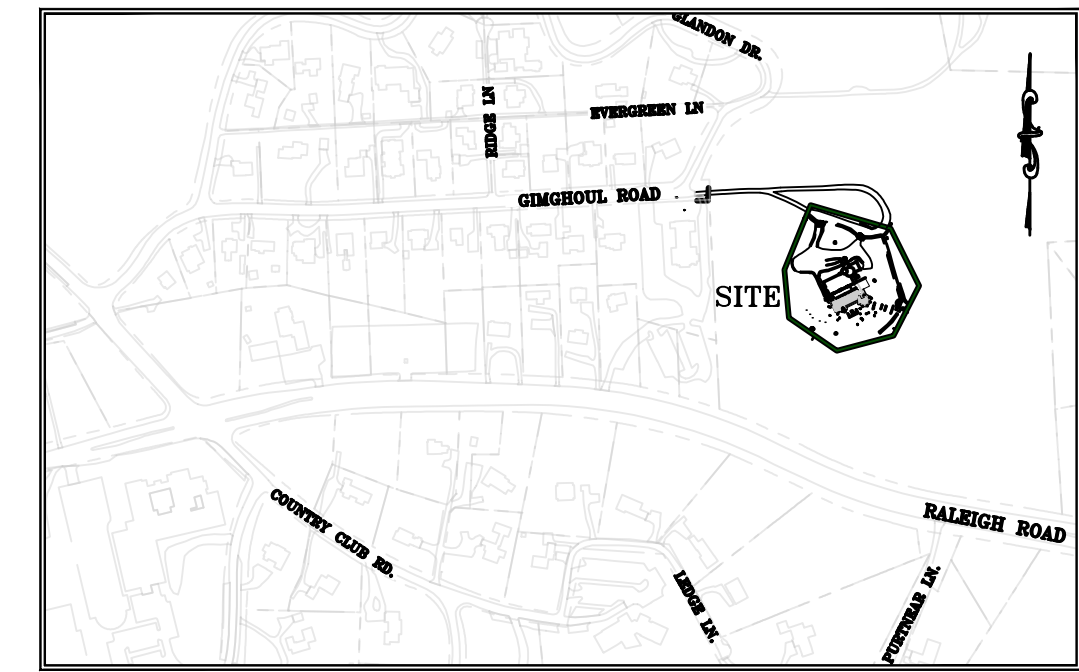
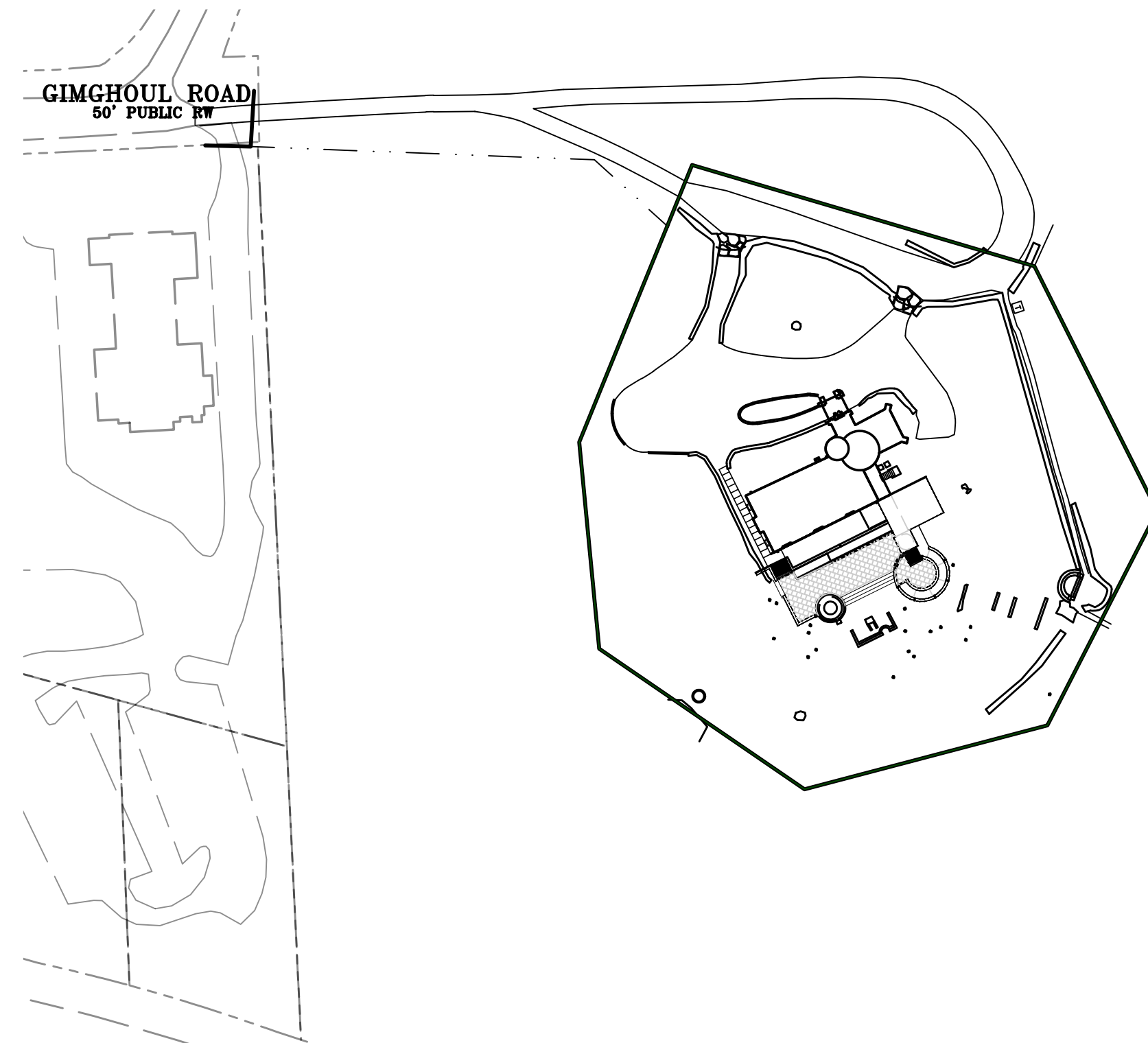


Purpose: The Energy Management Plan should explain what elements of a project's design will reduce or conserve energy, both for the building(s) and project site. Answers and supplemental information pertaining to the prompts below can serve as the narrative for the Energy Management Plan. For item #1, an energy model should be used to demonstrate the expected energy performance of the building(s) relative to the latest version of ASHRAE 90.1.

Guidance:

1. The energy management plan should indicate how the project will meet the Council's policy expectation of an energy performance that is 20% better than ASHRAE 90.1 (e.g., pre and post construction energy models will be used to verify performance). The project is required to use the most recent version of ASHRAE 90.1 for its baseline to achieve the "20% more energy efficient" standard.
2. The energy management plan should indicate whether or not a green building standard is being used and whether or not the applicant is pursuing a particular level of certification for that standard (e.g., LEED Gold, SB 668 for State Buildings, EarthCraft House).
3. The energy management plan should describe the expected savings (as a percentage) from both building and site related water conservation measures (e.g., WasterSense fixtures and toilets, xeriscaping, cisterns, graywater reuse, constructed wetland, rain garden, soil and moisture irrigation sensors).
4. The energy management plan should indicate what forms of sustainable energy are being utilized in this project (e.g., solar hot water, geothermal, solar photovoltaics, radiant heating/cooling, thermal energy storage).
5. The energy management plan should describe how the project aims to lower transportation-related energy consumption (e.g., project will build a bus shelter with solar-powered LED lighting).
6. The energy management plan should describe how the design aims to mitigate the urban heat-island effect (e.g., project will include a vegetative roof).
7. The energy management plan should indicate how the site design will enhance water and/or energy conservation (e.g., xeriscaping, tree shading, solar orientation).

8. The energy management plan should indicate if the site is reducing life-cycle and transportation related energy consumption based on its location and previous condition (e.g., brownfield redevelopment, grayfield redevelopment, urban infill).
9. The energy management plan should describe how the design of the project demonstrates a commitment to long term energy efficiency and reduced greenhouse gas emissions (e.g., durable materials, high-efficiency equipment, xeriscaping).
10. The energy management plan should describe how the lighting design will reduce energy consumption (e.g., high efficiency interior/exterior lighting, clerestory, passive solar, photocells, occupancy sensors, automated shades).
11. The energy management plan should indicate what percentage of the occupied rooms/office will have direct access to a reasonable amount of natural light.
12. The energy management plan should describe how the building envelope will reduce energy consumption (e.g., low-e glazing, R-38 insulation in the attic, north-south glazing orientation, thermal massing).
13. The energy management plan should describe how the building materials reduce life-cycle energy costs by their sourcing location/condition (e.g., recycled, locally sourced, certified sustainable, low VOC paints).
14. The energy management plan should indicate how the mechanical equipment will offer better energy performance than the minimum allowed by code (e.g., SEER 15 HVAC unit, enthalpy wheel).
15. The energy management plan should describe the various health and safety features that complement the energy efficient design (e.g., carbon dioxide monitors, frequency of air exchanges, access to natural light, low VOC building materials).
16. The energy management plan should describe what construction-phase steps will be taken to assure the building will perform as specified (e.g., envelope/duct air leakage test at dried in but unfinished phase, commissioning, etc.)



VICINITY MAP
NTS

BUILDING RENOVATION & PATIO ADDITION TO GIMGHOUL CASTLE

742 GIMGHOUL RD
CHAPEL HILL, NORTH CAROLINA

DRAWING INDEX:

- C1.1 COVER SHEET
- C1.2 STANDARD NOTES AND SPECIFICATIONS
- C2.1 SURVEY
- C2.3 EXISTING CONDITIONS & DEMOLITION PLAN
- C2.4 AREA MAP
- C3.1 SITE LAYOUT PLAN
- C4.1 GRADING & STORM DRAINAGE PLAN
- C4.2 STORMWATER MANAGEMENT PLAN
- C5.1 CONSTRUCTION MANAGEMENT PLAN
- C5.2 SOLID WASTE PLAN
- C6.1 UTILITY PLAN
- C7.1 EROSION CONTROL PLAN
- C7.2 EROSION CONTROL DETAILS
- C8.1 LANDSCAPE PROTECTION & PLANTING PLAN
- C9.1 ROADWAY IMPROVEMENT PLAN
- C10.1 SITE LIGHTING PLAN
- C11.1 SITE DETAILS

SITE DATA:

OWNER:	GIMGHOUL CORPORATION PO BOX 3670 CHAPEL HILL, NC 27515R	MAXIMUM BUILDING HEIGHT:	PRIMARY 29' SECONDARY 60'
APPLICANT:	GIMGHOUL CORPORATION PO BOX 3670 CHAPEL HILL, NC 27515R	MINIMUM LOT SIZE REQUIRED:	10,000 SF
PROJECT DESCRIPTION:	BUILDING RENOVATION AND PATIO ADDITION	MINIMUM LOT SIZE PROPOSED:	2.15 ACRES
EXISTING USE:	PRIVATE CLUB	NET LAND AREA (NLA):	93,849 SF
PROPOSED USE:	PRIVATE CLUB	GROSS LAND AREA (GLA):	103,234 SF
PIN:	9788-96-2765	IMPERVIOUS AREA	
DEED REFERENCE:	DB 851 PG 418	EXISTING:	24,602 SF 23.81%
PARCEL ACREAGE:	2.15 ACRES	DEMOLITION:	596 SF 0.57%
CURRENT ZONING:	R-1	PROPOSED:	4,298 SF 4.16%
PROPOSED ZONING:	OI-1 CZD	TOTAL:	28,304 SF 27.41%
OVERLAY ZONING:	GIMGHOUL HISTORIC DISTRICT (HD-3) JORDAN LAKE WATERSHED PROTECTION DISTRICT	LAND DISTURBANCE AREA:	18,500 SF
RESOURCE CONSERVATION DISTRICT SUMMARY (RCD)		PARKING SUMMARY	NONE REQUIRED
STREAM SIDE ZONE:	0 SF	BUILDING SUMMARY	
MANAGED USE ZONE:	0 SF	EXISTING FLOOR AREA:	5,055 SF
UPLAND ZONE:	0 SF	NEW FLOOR AREA:	1,200 SF
TOTAL RCD:	0 SF	TOTAL FLOOR AREA:	6,255 SF
RIVER BASIN:	CAPE FEAR RIVER BASIN (JORDAN LAKE)		
FLOODPLAIN:	NO FLOOD ZONE PER MAP #3701809788 K		
SOILS:	APPLING (AuC), WEDOWEE (WmE)		
ENVIRONMENTAL:	NO STREAMS, WETLANDS, NOR RCD		
NO. OF LOTS:	1 LOT		
BUILDING SETBACKS REQUIRED:	STREET: 24' INTERIOR: 8' SOLAR: 11'		
BUILDING SETBACKS PROVIDED:	STREET: 365' INTERIOR: 97' SOLAR: 108'		

LEGEND

	NEW	EXISTING	REMOVE
DRAINAGE STRUCTURE	■ □ △	□ ○ □ △	□ ○ □ △
SANITARY SEWER MANHOLE	⊙	⊙	⊙
SANITARY SEWER CLEANOUT	— C.O.	— C.O.	— C.O.
WATER VALVE	⊙	⊙	⊙
FIRE HYDRANT	⊙	⊙	⊙
OVERHEAD UTILITY LINE	— OH	— XOH	— DXOH
UNDERGROUND ELECTRIC LINE	— E	— XE	— DE
UNDERGROUND TELECOM/DATA LINE	— TD	— XTD	— DTD
FIBER OPTIC CABLE	— FO	— XFO	— DFO
GAS LINE	— G	— XG	— DG
STORM DRAINAGE PIPE	— SD	— XSD	— DSD
SANITARY SEWER LINE	— SS	— XSS	— DSS
WATER LINE	— W	— XW	— DW
SURFACE ELEVATION CONTOUR	— 400	— 400	— 400
SURFACE SPOT ELEVATION	⊕ 356.44	⊕ 356.44	⊕ 356.44
TREE LINE	~ ~ ~ ~ ~	○ ○ ○ ○ ○	○ ○ ○ ○ ○
LIMIT OF DISTURBANCE/CLEARING	— LOD	— LOD	— LOD
ROOF DRAIN	— RD	— RD	— DRD
ELECTRICAL TRANSFORMER PAD	⊞	⊞	⊞
TYPICAL KEYED NOTE LABEL	1	1	1

civil consultants
LAND PLANNERS & CIVIL ENGINEERS
WWW.CIVIL-CONSULTANTS.COM
2708 LUCKHAM PARKWAY • SUITE 201 • DURHAM, NC 27707
919-486-1030 FAX
Lic. #C-1030

GIMGHOUL
CASTLE
CHAPEL HILL, NORTH CAROLINA
COVER SHEET

REV.	DATE	DESCRIPTION
1	09/17/2021	TRT REVIEW COMMENTS
2	12/07/2021	TRT REVIEW COMMENTS
3	02/15/2022	TRT REVIEW COMMENTS
4	03/04/2022	BUFFER OPTION 1 (NO DISTURBANCE)
5	03/09/2022	LAND DISTURBANCE AREA

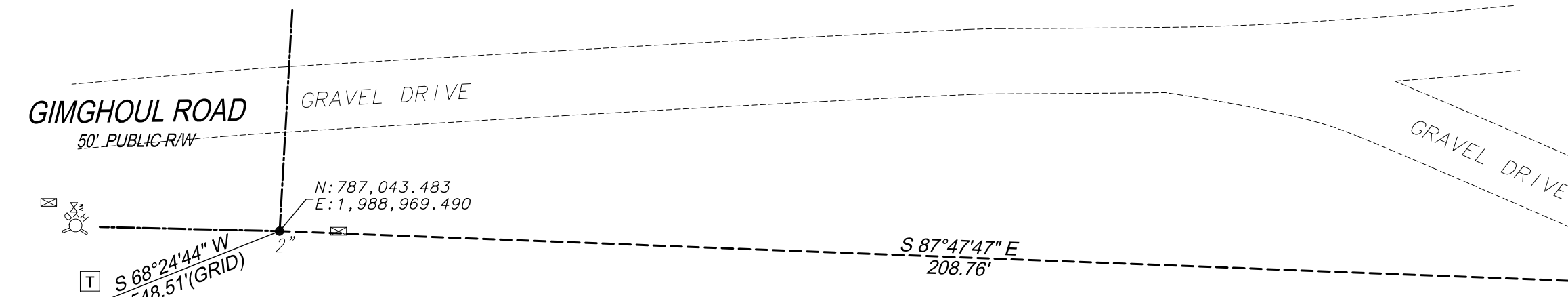
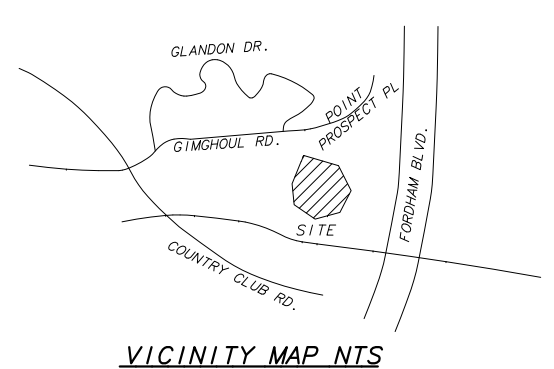
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SHEET NO.
C1.1



This document originally issued and sealed by Jose L. Torres, L-3771, on 07/01/2020. This medium shall not be considered a certified document.

SURVEYOR'S CERTIFICATION

I, Jose L. Torres, certify that this project was completed under my direct and responsible charge from an actual survey made under my supervision; that this ground survey was performed at the 95 percent confidence level (2 sigma) to meet Federal Geographic Data Committee Standards; that the horizontal accuracy is 1:10,000, that the vertical accuracy is 1:10,000 and that the original data was obtained on June 17, 2020; that the survey was completed on July 1, 2020; that contours shown meet the stated standard; and all coordinates are based on NAD 83 (2011), and all elevations are based on NAVD 88.

- Furthermore:
- THE SURVEY CONTROL POINTS NOTED WERE DERIVED FROM GPS OBSERVATIONS BASED ON THE FOLLOWING:
- 1) CLASS OF SURVEY: CLASS C
 - 2) POSITIONAL ACCURACY: MAXIMUM RESIDUAL 0.038 FT(H) 0.092 FT(V)
 - 3) TYPE OF GPS FIELD PROCEDURE: REAL-TIME KINEMATIC WRS
 - 4) DATE OF SURVEY: JUNE 17, 2020
 - 5) DATUM/EPOCH: NAD 1983(2011)
 - 6) PUBLISHED/FIXED CONTROL USE: TATUM N=786473.70 E=1987529.48
 - 7) GEOID MODEL: GTO18
 - 8) COMBINED GRID FACTOR: 0.99992141
 - 9) UNITS: US SURVEY FOOT
 - 10) GPS INSTRUMENTATION: TRIMBLE RB DKSS

DATE: _____ SURVEYOR: JOSE L. TORRES, PLS L-3771

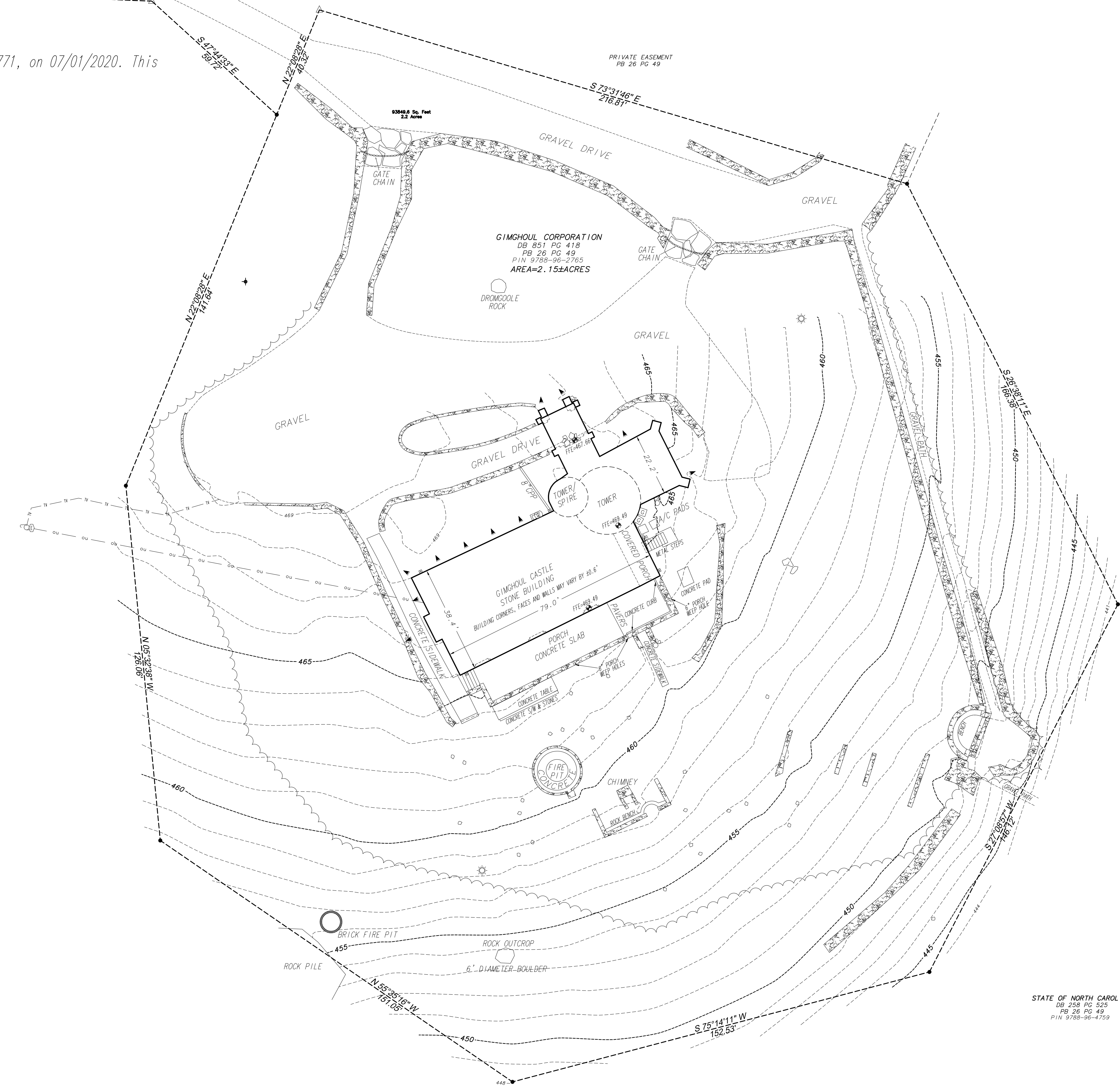
STATE OF NORTH CAROLINA
DB 258 PG 525
PB 26 PG 49
PIN 9788-96-4759

LEGEND

- EXISTING IRON PIPE (1/2")
- ▲ EXISTING "MAG" NAIL
- COMPUTED POINT
- ⊕ WATER METER
- ⊕ FIRE HYDRANT
- ⊕ WATER VALVE
- ⊕ YARD SPIGOT
- ⊕ ROOF DRAIN
- ⊕ FLOOD LIGHT
- ⊕ GAS METER
- ⊕ ELECTRIC PANEL
- ⊕ UTILITY POLE W/ METER
- ⊕ TRANSFORMER
- ⊕ LIGHT POLE
- ⊕ CLEAN OUT
- ⊕ FINISHED FLOOR ELEVATION
- ⊕ ROCK OUTCROP
- ⊕ CABLE TV BOX
- ⊕ UNDERGROUND CATV
- ⊕ OVERHEAD UTILITIES
- ⊕ TREE LINE
- ⊕ WATER LINE
- ⊕ BOUNDARY LINE
- ⊕ PROPERTY LINE NOT SURVEYED
- ⊕ PUBLIC RIGHT-OF-WAY LIMITS
- ⊕ ROCK WALLS

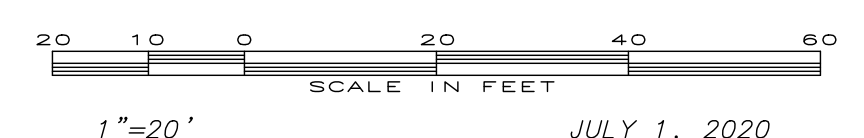
NOTES

- 1) THIS IS NOT A BOUNDARY SURVEY. BOUNDARY INFORMATION TAKEN FROM EXISTING MONUMENTATION AND DEEDS AND PLATS OF RECORD.
- 2) HORIZONTAL GROUND DISTANCES SHOWN.
- 3) THIS PROPERTY IS LOCATED IN THE CAPE FEAR RIVER BASIN.
- 4) UNLESS NOTED OTHERWISE, ALL REFERENCES ARE ORANGE COUNTY.
- 5) AREAS, IF SHOWN, COMPUTED BY THE CO-ORDINATE METHOD.
- 6) THIS SURVEY PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT; THEREFORE, ENCUMBRANCES AFFECTING TITLE TO THE SUBJECT PROPERTY MAY EXIST BUT ARE NOT NECESSARILY DEPICTED BY THIS SURVEY.
- 7) UNDERGROUND UTILITIES SHOWN AS MARKED BY THE IR RESPECTIVE AGENTS. THERE ARE ADDITIONAL UNDERGROUND UTILITIES WHICH WERE NOT SHOWN NOR MARKED. ALL UNDERGROUND UTILITIES SHOULD BE MARKED PRIOR TO ANY EXCAVATION OR CONSTRUCTION.



STATE OF NORTH CAROLINA
DB 258 PG 525
PB 26 PG 49
PIN 9788-96-4759

PARTIAL TOPOGRAPHIC SURVEY
PROPERTY OF
GIMGHOU CORPORATION
CHAPEL HILL TOWNSHIP
ORANGE COUNTY, NORTH CAROLINA



JULY 1, 2020

RILEY SURVEYING, P.A.
3326 DURHAM CHAPEL HILL BLVD. STE B-100
DURHAM, N.C. 27707
919-667-0742 C-1281 jltorres@rileysurveyingpa.com

GIMGHOUL ROAD
50' PUBLIC RW

N= 787,043.483
E= 1,988,969.490

PRIVATE EASEMENT
PB 26 PG 49

BATTLE PARK
STATE OF NORTH CAROLINA
DB 258 PG 525
PB 26 PG 49
PIN: 9788-96-4759

PRIVATE EASEMENT
PB 26 PG 49

GIMGHOUL CORPORATION
DB 851 PG 418
PB 26 PG 49
PIN: 9788-96-2765
AREA=2.15± ACRES

BATTLE PARK
STATE OF NORTH CAROLINA
DB 258 PG 525
PB 26 PG 49
PIN: 9788-96-4759

BATTLE PARK
STATE OF NORTH CAROLINA
DB 258 PG 525
PB 26 PG 49
PIN: 9788-96-4759

NOTES

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.
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 IF 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.

GIMGHOUL CASTLE
CHAPEL HILL, NORTH CAROLINA
EXISTING CONDITIONS & DEMOLITION PLAN

REV.	DATE	DESCRIPTION
1	09/17/2021	TRT REVIEW COMMENTS
2	12/07/2021	TRT REVIEW COMMENTS
3	02/15/2022	TRT REVIEW COMMENTS

DATE: FEBRUARY 4 2021

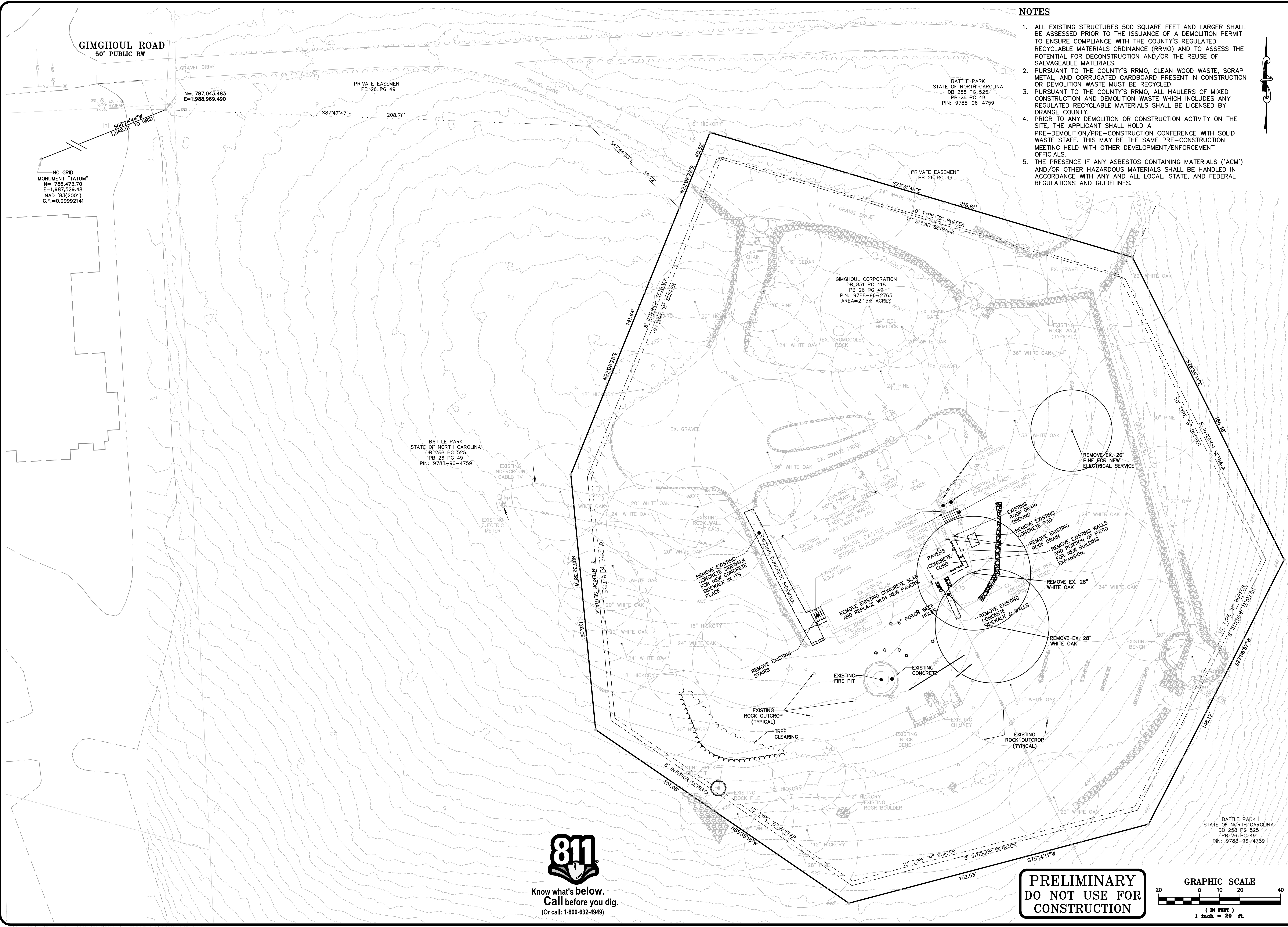
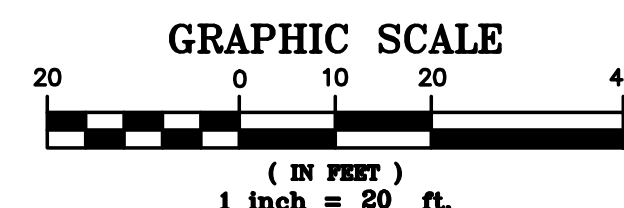
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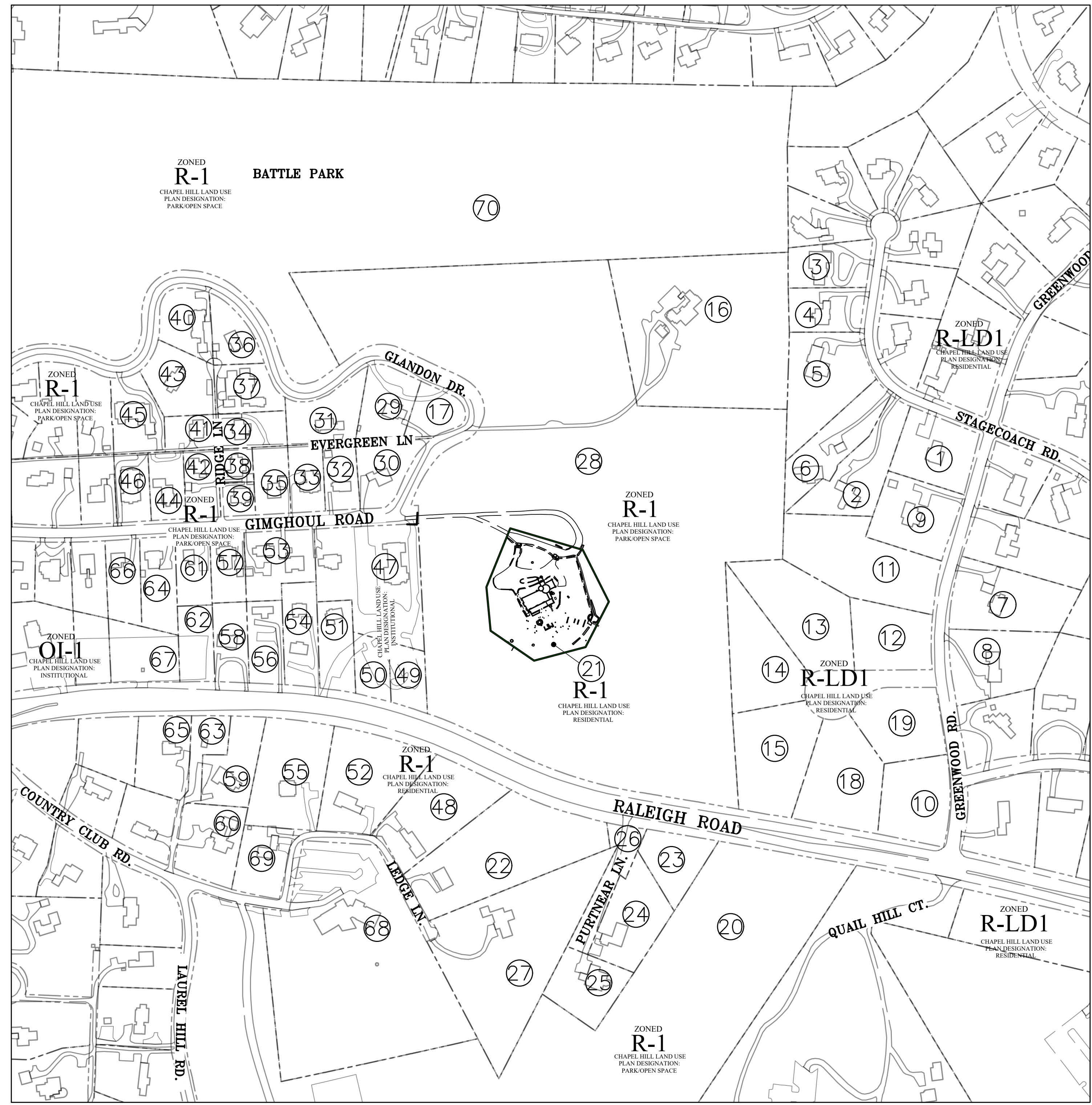
SHEET NO.
C2.3



**PRELIMINARY
DO NOT USE FOR
CONSTRUCTION**



1	9798073185	BROCK RICHARD J	900 GREENWOOD RD	CHAPEL HILL	NC	275143910
2	9798071069	BRACHMAN LISA	201 STAGECOACH RD	CHAPEL HILL	NC	27514
3	9798070679	MORRIS CATHERINE CARTER	219 STAGECOACH RD	CHAPEL HILL	NC	27514
4	9798070576	TAYLOR NICHOLAS	215 STAGECOACH RD	CHAPEL HILL	NC	275143922
5	9798070358	BRUNO ELIZABETH	211 STAGECOACH RD	CHAPEL HILL	NC	27514
6	9798070178	SPITLER ERIC J TRUSTEE	207 STAGECOACH RD	CHAPEL HILL	NC	27514
7	9798065784	SEEGER FRIEDERIKE	905 GREENWOOD RD	CHAPEL HILL	NC	27514
8	9798065565	SODE KOJI	907 GREENWOOD RD	CHAPEL HILL	NC	27514
9	9798063947	BUCKLAD MATTHEW A	908 GREENWOOD RD	CHAPEL HILL	NC	27514
10	9798063116	UNIVERSITY OF N C	UNKNOWN ADDRESS	CHAPEL HILL	NC	27514
11	9798061863	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	RALEIGH	NC	27603
12	9798062663	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	RALEIGH	NC	27603
13	9798060639	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	RALEIGH	NC	27603
14	9788968588	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	RALEIGH	NC	27603
15	9788969331	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	RALEIGH	NC	27603
16	9788977537	LORELLI CHARLES A	1 POINT PROSPECT PLACE	CHAPEL HILL	NC	275143932
17	9788970325	DAVIS ROBERTO A	408 PATTERSON PL W	CHAPEL HILL	NC	27516
18	9798060273	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	RALEIGH	NC	27603
19	9798062368	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	RALEIGH	NC	27600
20	9788941696	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	UNKNOWN	XX	0
21	9788962765	GIMGHOUL CORPORATION	PO BOX 3670	CHAPEL HILL	NC	27515
22	9788961064	FRELIER ALEXANDER	107 LEDGE LN	CHAPEL HILL	NC	27514
23	9788956909	FERGUSON JAMES GATES JR	P O BOX 869	CHAPEL HILL	NC	27514
24	9788954881	FERGUSON JAMES GATES JR	P O BOX 869	CHAPEL HILL	NC	27514
25	9788953684	FERGUSON JAMES GATES JR	P O BOX 869	CHAPEL HILL	NC	27514
26	9788954920	FERGUSON JAMES GATES JR	P O BOX 869	CHAPEL HILL	NC	275140869
27	9788951794	ECCLE TRUST	109 LEDGE LN	CHAPEL HILL	NC	27514
28	9788964759	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	RALEIGH	NC	27603
29	9788878389	DOELL SANDRA D	360 GLANDON DR	CHAPEL HILL	NC	27514
30	9788877172	NEWTON ADRIAN J III	741 GIMGHOUL RD	CHAPEL HILL	NC	275143815
31	9788876216	TOLEDO COURTNEY E	300 GLANDON DR	CHAPEL HILL	NC	275143818
32	9788876150	PARROTT WICKI LYNN	739 GIMGHOUL RD	CHAPEL HILL	NC	275143815
33	9788875140	WHITTINGTON DALE	737 GIMGHOUL RD	CHAPEL HILL	NC	275143815
34	9788874215	WHARTON ELISABETH D	110 RIDGE LN	CHAPEL HILL	NC	27514
35	9788874059	ABBEY JEFFREY DAVID	735 GIMGHOUL RD	CHAPEL HILL	NC	27514
36	9788873459	SCHOULTZ LARS	250 GLANDON DR	CHAPEL HILL	NC	275143816
37	9788873375	JENSEN BRIAN COLWELL	260 GLANDON DR	CHAPEL HILL	NC	27514
38	9788873151	RABKIN MIRIAM	106 RIDGE LN	CHAPEL HILL	NC	27514
39	9788873064	DEMOSTHENIAN HOLDINGS LLC	4525 PROVINCE LINE RD	PRINCETON	NJ	8540
40	9788872523	GUILKEY DAVID K	246 GLANDON DR	CHAPEL HILL	NC	275143816
41	9788872202	MURPHY EDWARD JAMES III	111 RIDGE LN	CHAPEL HILL	NC	27514
42	9788872048	WHITE JAMES W	105 RIDGE LN	CHAPEL HILL	NC	275143830
43	9788871387	MILES MIKE E	240 GLANDON DR	CHAPEL HILL	NC	27514
44	9788871057	BRITT MARGURETE R	1412 VILLAGE CROSSING DR	CHAPEL HILL	NC	27517
45	9788870269	NOELL PAULA DAVIS TRUSTEE	232 GLANDON DR	CHAPEL HILL	NC	27514
46	9788870056	MCBRIDE PAUL M II TRUSTEE	719 GIMGHOUL RD	CHAPEL HILL	NC	27514
47	9788868855	CAVALIER ASSETS LLC	1289 FORDHAM BLVD #123	CHAPEL HILL	NC	27514
48	9788869165	MODLIN D MICHAEL	105 LEDGE LN	CHAPEL HILL	NC	27514
49	9788869640	CAVALIER ASSETS LLC	1289 FORDHAM BLVD #123	CHAPEL HILL	NC	27514
50	9788868643	CAVALIER ASSETS LLC	1289 FORDHAM BLVD #123	CHAPEL HILL	NC	27514
51	9788867639	CAVALIER ASSETS LLC	1289 FORDHAM BLVD #123	CHAPEL HILL	NC	27514
52	9788867266	JCAC LLC	9104 GLENWOOD AVE	RALEIGH	NC	27617
53	9788865972	M AND T CH PROP INC ETAL & KEVIN BIESE	738 GIMGHOUL RD	CHAPEL HILL	NC	27514
54	9788865635	CHEEVER CHRISTOPHER R	805 MEADOW LN	HENDERSON	NC	27536
55	9788865233	101 LEDGE LANE LLC	100 CRESCENT CT	DALLAS	TX	75201
56	9788864631	HUSE HENRY	24 SABLE CT	NORWALK	CT	6854
57	9788863824	ANDERSON ALLEN L	728 GIMGHOUL RD	CHAPEL HILL	NC	275143811
58	9788863634	EAGLE HOLDINGS LLC	P O BOX 834	TRUSSVILLE	AL	35173
59	9788863264	MARTIN DAVID GRIER JR	313 COUNTRY CLUB RD	CHAPEL HILL	NC	275143904
60	9788863005	SEARING DONALD TRUSTEE	307 COUNTRY CLUB RD	CHAPEL HILL	NC	27514
61	9788862824	DILL MATTHEW L	724 GIMGHOUL RD	CHAPEL HILL	NC	27514
62	9788862634	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	UNKNOWN	XX	0
63	9788862351	MARTIN DAVID G JR	313 COUNTRY CLUB RD	CHAPEL HILL	NC	275143904
64	9788861729	DAWE DAVID	720 GIMGHOUL RD	CHAPEL HILL	NC	27514
65	9788861259	MARY LOU QUINTO LIVING TRUST	150 CHAPMAN	SAN FRANCISCO	CA	94110
66	9788860821	BRODEY BENJAMIN B	716 GIMGHOUL RD	CHAPEL HILL	NC	27514
67	9788860599	STATE OF NORTH CAROLINA	UNKNOWN ADDRESS	UNKNOWN	XX	0
68	9788858707	CORP PRES BISHOP CH JESUS CHRIST-LDS	LDS CHURCH TAX DIVISION	SALT LAKE CITY	UT	84150
69	9788854949	ROSEMAN MARK J	321 COUNTRY CLUB RD	CHAPEL HILL	NC	275143904
70	9788543697	UNIVERSITY OF N C	PROPERTY OFFICE UNC	CHAPEL HILL	NC	27599



OWNER
GIMGHOUL CORPORATION
PO BOX 3670
CHAPEL HILL, NC 27515

ZONING LEGEND

- R-1 RESIDENTIAL 1, 3 UNITS /ACRE
- R-LD1 RESIDENTIAL-LOW DENSITY, 1 UNIT/ACRE
- OI-1 OFFICE & INSTITUTIONAL 1

LEGEND

- SUBJECT PROPERTY
- 1,000 FOOT NOTIFICATION BOUNDARY
- ZONING DISTRICTS
- OVERLAY DISTRICTS
- CHAPEL HILL LAND USE PLAN DESIGNATION: INSTITUTIONAL

- NOTES:**
- THERE IS AN UNPAVED GREENWAY ON THE PROPERTY THAT SURROUNDS THE SUBJECT PROPERTY. BATTLE PARK IS LOCATED WITHIN THE 1,000 FOOT NOTIFICATION OF THE SUBJECT PROPERTY.
 - THERE ARE NO BICYCLE LANES WITHIN 1,000 FEET OF THE SUBJECT PROPERTY.
 - THIS PROPERTY AND ALL PROPERTY WITHIN 1,000 FEET OF THE PROPERTY ARE WITHIN THE TOWN OF CHAPEL HILL, NC CORPORATE LIMITS.

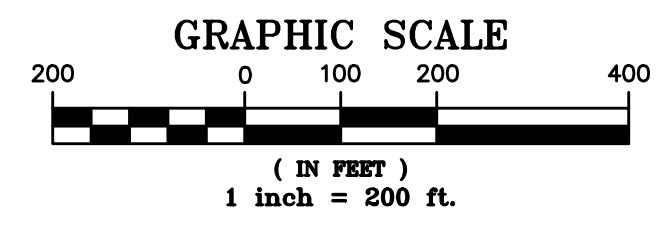
OVERLAY DISTRICTS

- HD-3 (HISTORIC DISTRICT)
- CD-2 (NEIGHBORHOOD CONSERVATION)
- GIMGHOUL GREENWOOD



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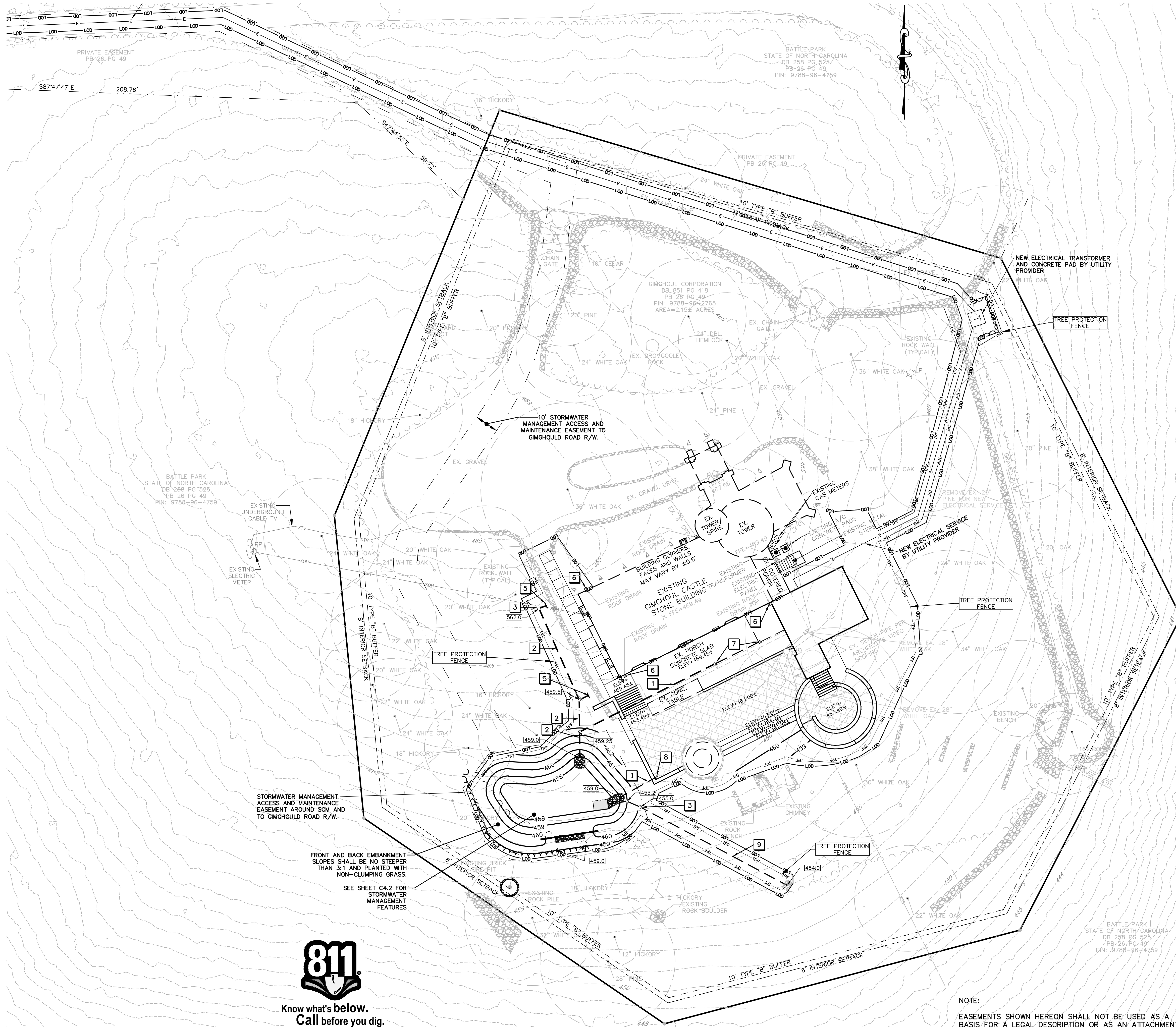
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REV.	DATE	DESCRIPTION
1	11/18/2020	PROGRESS MODIFICATIONS
DATE: FEBRUARY 4 2021		

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KEY KEYED NOTES – GRADING & STORM DRAINAGE PLAN

- 1 NEW 4" DIAMETER ROOF DRAINAGE PIPE AT 1% MINIMUM SLOPE.
- 2 NEW 6" DIAMETER ROOF DRAINAGE PIPE AT 1% MINIMUM SLOPE.
- 3 ADD CLEANOUT ASSEMBLY TO ROOF DRAIN, SIMILAR TO SANITARY SEWER CLEANOUT DETAIL.
- 4 SEE ARCHITECTURAL DRAWINGS FOR FINISHED ELEVATIONS FOR TERRACE, STEPS, AND SIDEWALK.
- 5 MAKE WATERTIGHT CONNECTIONS TO ROOF DRAIN STUBOUTS FROM ARCHITECTURAL DRAWINGS.
- 6 EXISTING DOWNSPOUT TO DRAIN TO FILTERRA DEVICE. SEE ARCHITECTURAL DRAWINGS. FOR ANY EXISTING ROOF DRAIN PIPING INDICATED TO REMAIN IN SERVICE, CONDUCT VISUAL EXAMINATION OF PIPE WITH FLOWING WATER TO VERIFY FUNCTIONALITY; RESOLVE ANY DEFICIENCIES FOUND TO THE ARCHITECT'S SATISFACTION.
- 7 INSTALL NEW CATCH BASINS AT LOW POINTS IN EXISTING PORCH. BASINS SHALL BE 9" X 9" THERMOPLASTIC UNITS WITH SQUARE "ATRIUM" GRATE BY NDS, OR EQUIVALENT. INSTALL UNIT TO PROVIDE POSITIVE DRAINAGE FROM THE PORCH.
- 8 MILDLY SLOPE THE WESTERN PORTION OF THE NEW LOWER TERRACE SURFACE TO DRAIN TO A NEW CATCH BASIN AT THE LOW POINT IN THE CORNER. BASINS SHALL BE 9" X 9" THERMOPLASTIC UNITS WITH SQUARE "ATRIUM" GRATE BY NDS, OR EQUIVALENT. INSTALL UNIT TO PROVIDE POSITIVE DRAINAGE FROM THE NEW LOWER TERRACE. SEE ARCHITECTURAL DRAWINGS OF TERRACE AND CANOPY FOR DETAIL.
- 9 NEW 8" DIAMETER DRAINAGE PIPE AT 1% MINIMUM SLOPE.

IMPERVIOUS SURFACE:

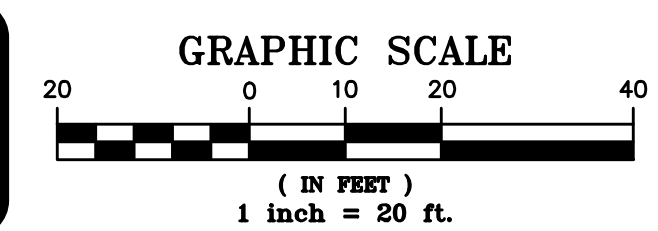
EXISTING:	24,602 SF
DEMOLITION:	596 SF
PROPOSED:	4,298 SF
TOTAL:	28,304 SF

NOTES

1. NO STEEP SLOPE AREAS ARE PRESENT ON THIS PROPERTY.
2. SEE SHEET C2.2 FOR MORE DETAIL ABOUT EXISTING TOPOGRAPHIC CONDITIONS.
3. SEE SHEET C4.2 FOR STORMWATER MANAGEMENT PLAN AND DETAILS.
4. SOILS ON THE SITE ARE AuC AND WmE.

NOTE:
EASEMENTS SHOWN HEREON SHALL NOT BE USED AS A BASIS FOR A LEGAL DESCRIPTION OR AS AN ATTACHMENT TO A DEED OF EASEMENT.

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REV.	DATE	DESCRIPTION
1	09/17/2021	TRT REVIEW COMMENTS
2	12/07/2021	TRT REVIEW COMMENTS
4	03/04/2022	BUFFER OPTION 1 (NO DISTURBANCE)

DATE: FEBRUARY 4, 2021

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SHEET NO.

C4.1



GIMGHOUL ROAD
50' PUBLIC RW

GRAVEL DRIVE

PRIVATE EASEMENT
PB 26 PG 49

S87°47'47"E 208.76'

VEHICULAR ACCESS
AND CIRCULATION

S72°43'31"E 58.72'

BATTLE PARK
STATE OF NORTH CAROLINA
DB 258 PG 525
PB 26 PG 49
PIN: 9788-96-4759

PRIVATE EASEMENT
PB 26 PG 49

CONSTRUCTION
PARKING AND LAYDOWN AREA;
CONSTRUCTION TRAILER IF USED

BATTLE PARK
STATE OF NORTH CAROLINA
DB 258 PG 525
PB 26 PG 49
PIN: 9788-96-4759

INSTALL TEMPORARY SIGN
"INSPECTIONS PARKING ONLY"

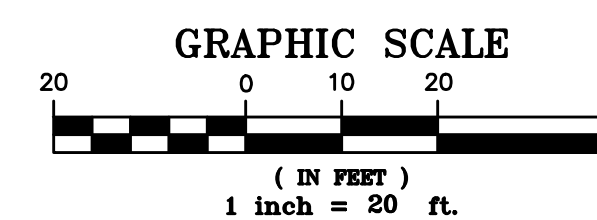
CONSTRUCTION MANAGEMENT PLAN NOTES:

1. EMERGENCY VEHICLE ACCESS SHALL BE VIA GIMGHOUL ROAD AND THE PRIVATE DRIVE TO THE PROPERTY.
2. CONSTRUCTION VEHICLES AND MATERIAL STAGING SHALL NOT IMPEDE ACCESS AND EGRESS FOR EMERGENCY VEHICLES.
3. THE SITE SHALL BE CLEAN AT THE END OF EACH WORKING DAY THAT IS SATISFACTORY TO THE OWNER'S REPRESENTATIVE.



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**GIMGHOUL
CASTLE
CHAPEL HILL, NORTH CAROLINA
CONSTRUCTION MANAGEMENT
PLAN**

REV.	DATE	DESCRIPTION
2	12/07/2021	TRT REVIEW COMMENTS

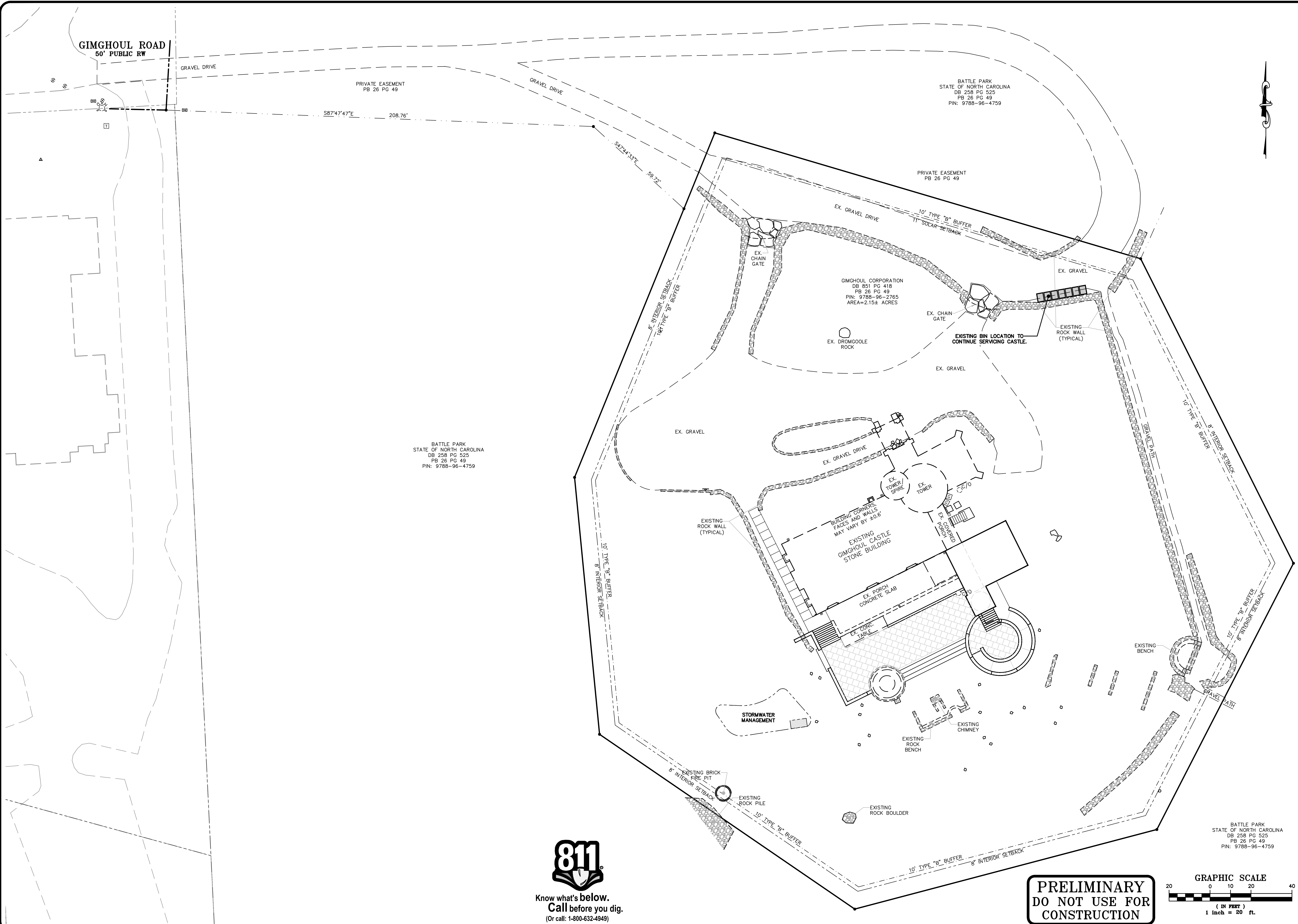
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C5.1



GIMGHOUL CASTLE
 CHAPEL HILL, NORTH CAROLINA
SOLID WASTE PLAN

REV.	DATE	DESCRIPTION
2	12/07/2021	TRT REVIEW COMMENTS

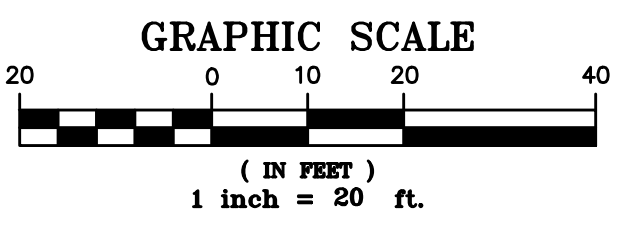
DATE: FEBRUARY 4, 2021

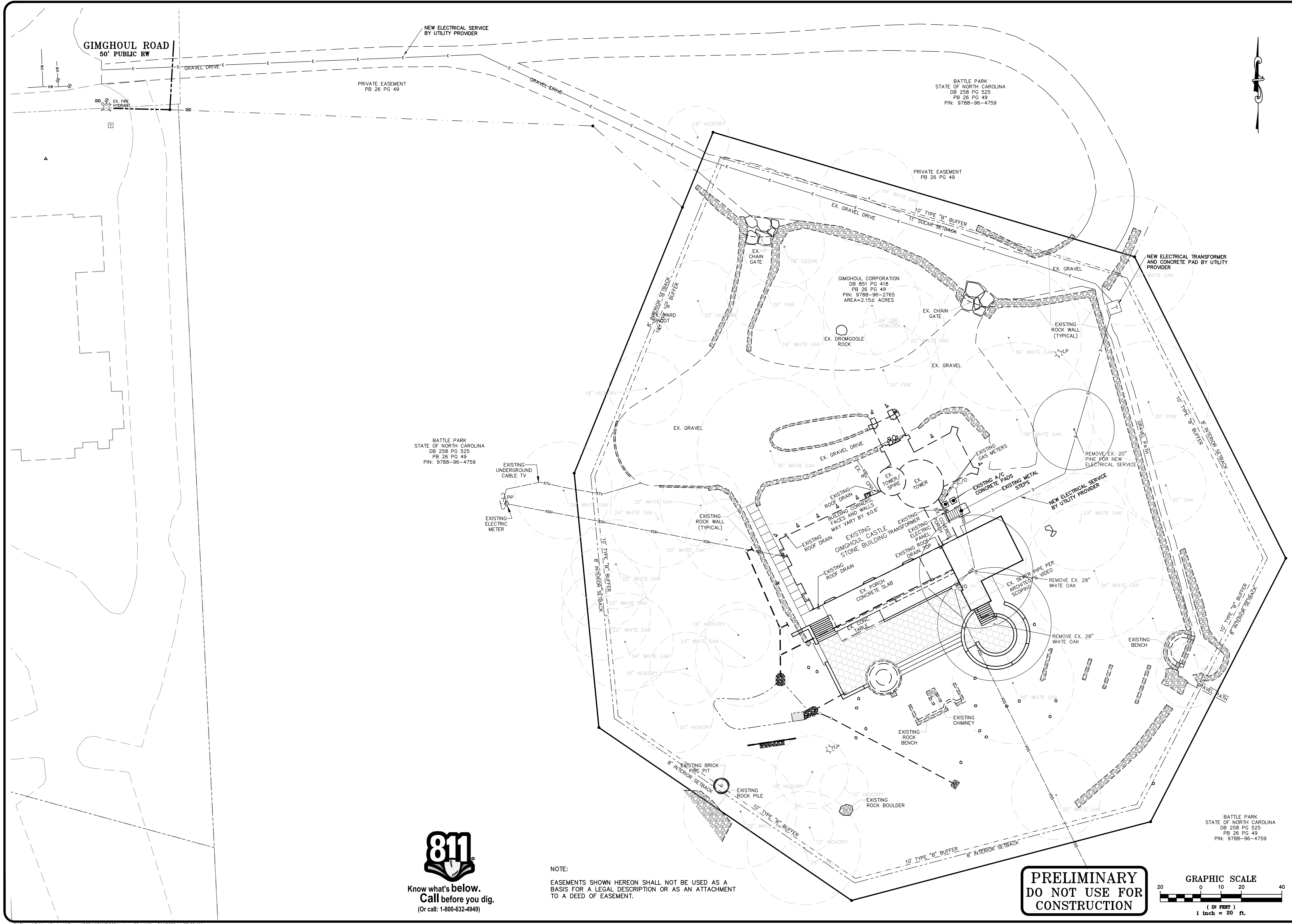
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GIMGHOUL ROAD
50' PUBLIC RW

NEW ELECTRICAL SERVICE
BY UTILITY PROVIDER

PRIVATE EASEMENT
PB 26 PG 49

BATTLE PARK
STATE OF NORTH CAROLINA
DB 258 PG 525
PB 26 PG 49
PIN: 9788-96-4759

PRIVATE EASEMENT
PB 26 PG 49

GIMGHOUL CORPORATION
DB 851 PG 418
PB 26 PG 49
PIN: 9788-96-2765
AREA=2.15± ACRES

NEW ELECTRICAL TRANSFORMER
AND CONCRETE PAD BY UTILITY
PROVIDER

BATTLE PARK
STATE OF NORTH CAROLINA
DB 258 PG 525
PB 26 PG 49
PIN: 9788-96-4759

civil consultants
LAND PLANNERS + CIVIL ENGINEERS
WWW.CIVIL-CONSULTANTS.COM
3708 LYCKMAN PARKWAY • SUITE 201 • DURHAM, NC 27707
919-480-1645 PHONE
Lic. #C-1030

**GIMGHOUL
CASTLE**
CHAPEL HILL, NORTH CAROLINA
**UTILITY
PLAN**

REV.	DATE	DESCRIPTION
2	12/07/2021	TRT REVIEW COMMENTS
4	03/04/2022	BUFFER OPTION 1 (NO DISTURBANCE)

DATE: FEBRUARY 4, 2021

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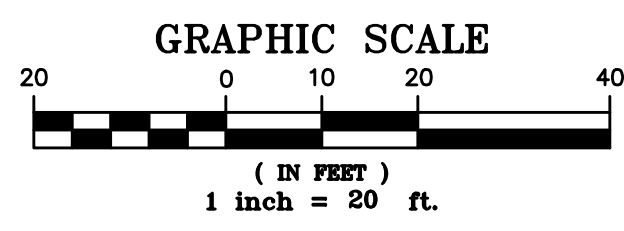
DATE: FEBRUARY 4, 2021

SHEET NO.
C6.1

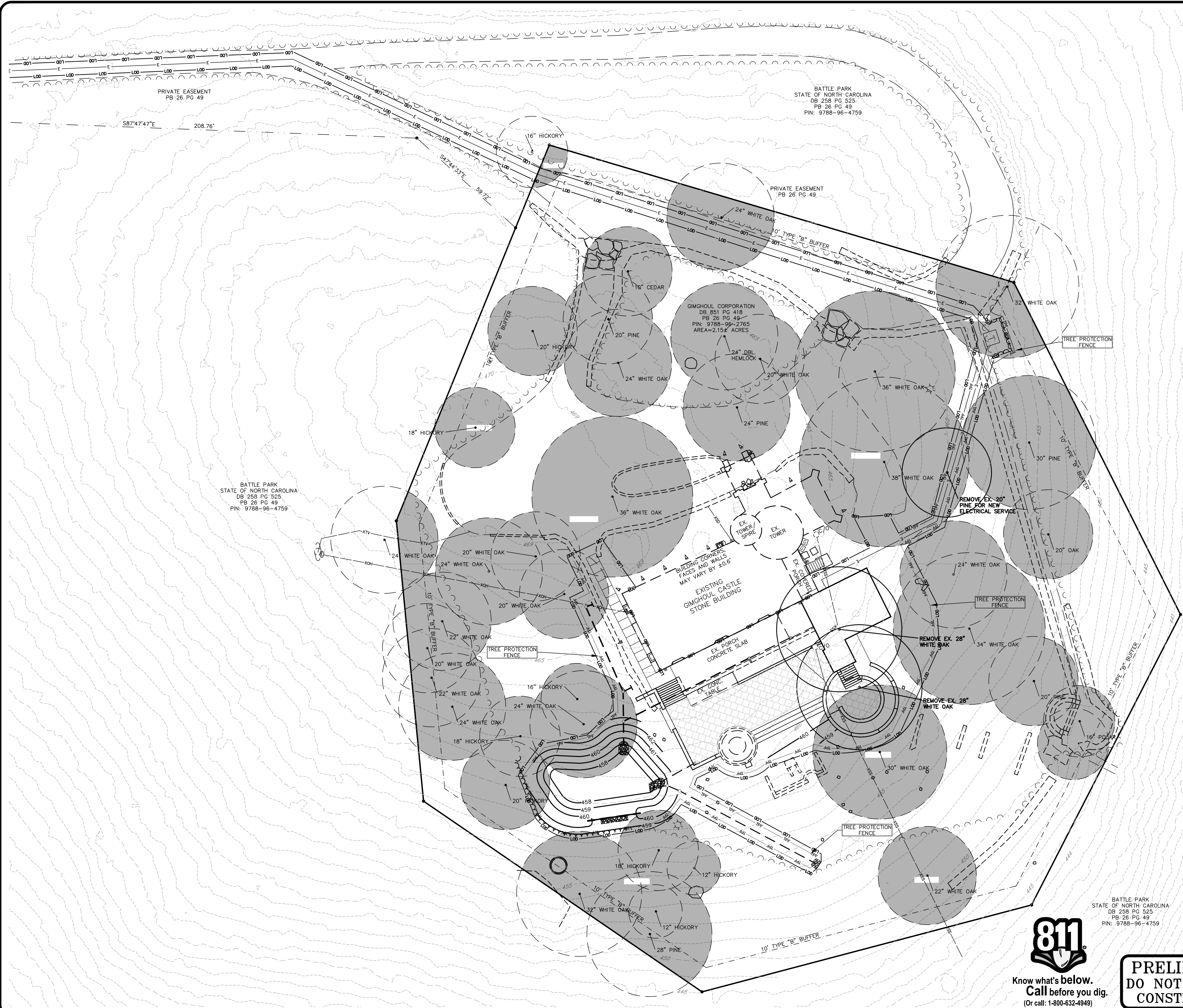


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BATTLE PARK
STATE OF NORTH CAROLINA
DB 258 PG 525
PB 26 PG 49
PIN: 9788-96-4759



EXISTING TREE COVERAGE
 EXISTING PROPERTY AREA = 93,850 SF
 EXISTING TREE COVERAGE AREA = 49,173 SF
 PERCENT OF PROPERTY = 52.4%

- LANDSCAPE PROTECTION PLAN NOTES:**
1. ALL TREE PROTECTION FENCE AND TEMP SILT FENCE SHALL BE INSTALLED BEFORE CLEARING AND GRADING.
 2. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PROTECT EXISTING TREES.
 3. THE LANDSCAPING WITHIN THE EXISTING PERIMETER BUFFERS SHALL NOT BE DISTURBED.

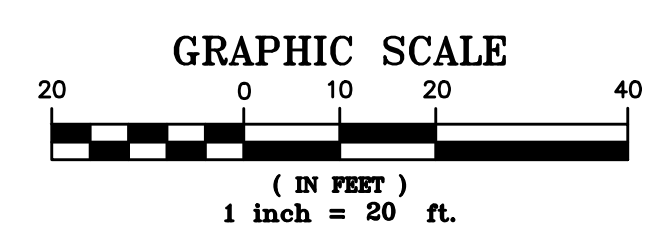
- LANDSCAPE PLANTING NOTES:**
1. EXISTING FOLIAGE, WITH THE EXCEPTION OF ONE TREE TO BE REMOVED FOR NEW ELECTRICAL SERVICE, WILL BE PRESERVED AND CONTINUE TO SATISFY BUFFER REQUIREMENTS

BATTLE PARK
 STATE OF NORTH CAROLINA
 DB 258 PG 525
 PB 26 PG 49
 PIN: 9788-96-4759



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**GIMGHOUL
 CASTLE
 CHAPEL HILL, NORTH CAROLINA
 LANDSCAPE PROTECTION AND
 PLANTING PLAN**

REV.	DATE	DESCRIPTION
1	09/17/2021	TRT REVIEW COMMENTS
2	12/07/2021	TRT REVIEW COMMENTS
4	03/04/2022	BUFFER OPTION 1 (NO DISTURBANCE)

DATE: FEBRUARY 4 2021

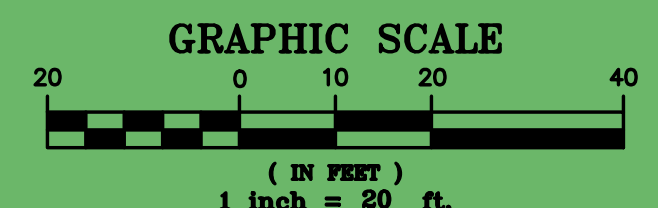
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Z:\Shared Folders\Projects\Corona\26011\DWG\26011.dwg, C8.1 Lscape Prot & Plan, 3/4/2022 11:45:44 AM



LEGEND	
EXISTING TREE TO REMAIN	18" HICKORY
EXISTING WOODS	[Grey shaded area]
EXISTING YARD AREA	[Light green shaded area]
PROPOSED CONSTRUCTION	[Light blue shaded area]
EXISTING BUILDING/FEATURE TO REMAIN	[Brown shaded area]
PROPOSED CONSTRUCTION IN PLACE OF EXISTING FEATURE	[Dark blue shaded area]
EXISTING GRAVEL DRIVE & PARKING	[Grey shaded area]

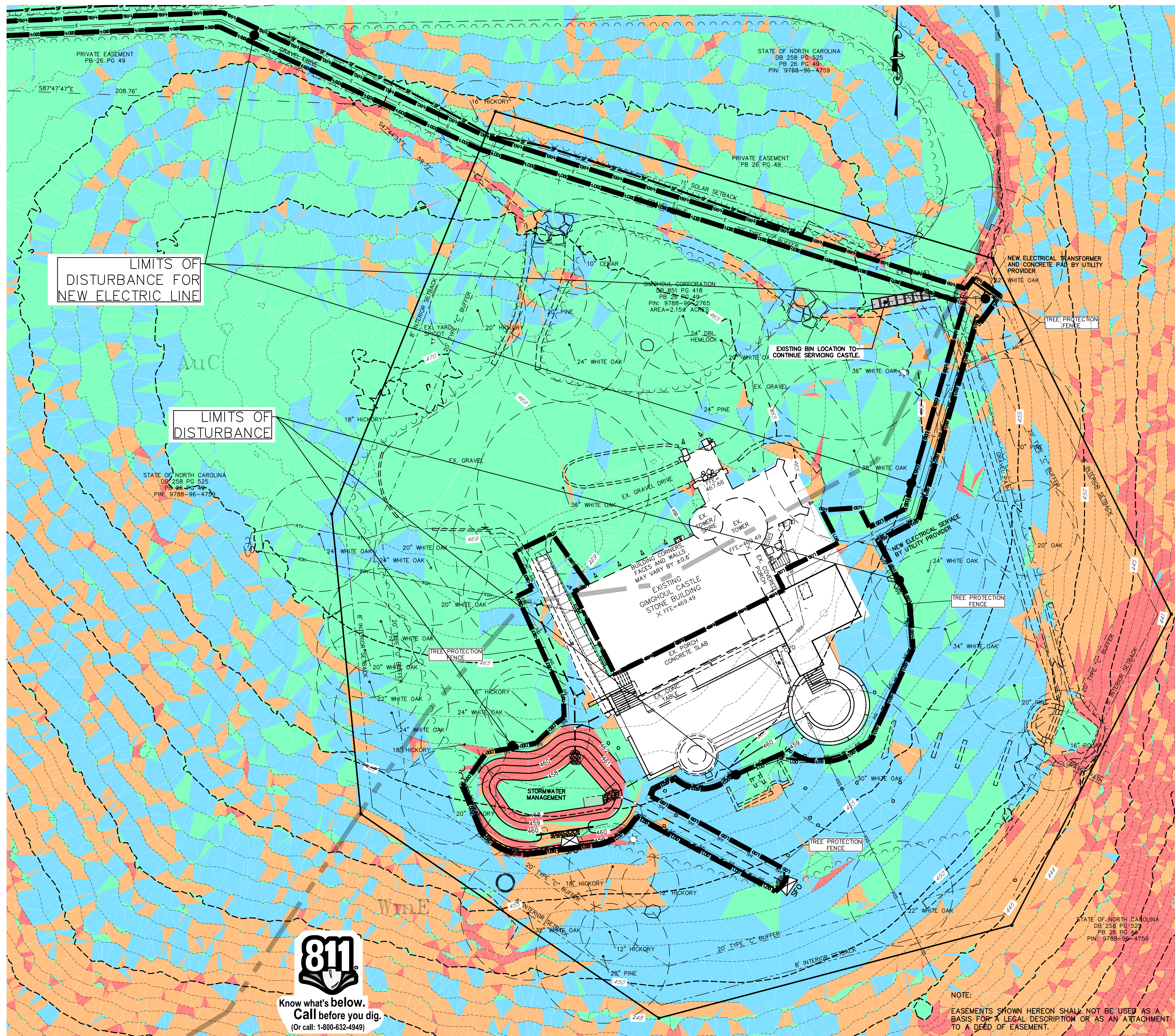


GIMGHOUL CASTLE
 CHAPEL HILL, NORTH CAROLINA
 SITE LAYOUT EXHIBIT

REV.	DATE	DESCRIPTION
2	12/07/2021	TRT REVIEW COMMENTS

DATE: FEBRUARY 4, 2021

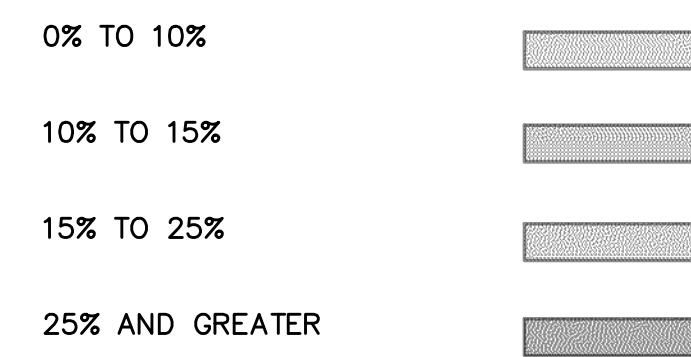
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LIMITS OF DISTURBANCE FOR NEW ELECTRIC LINE

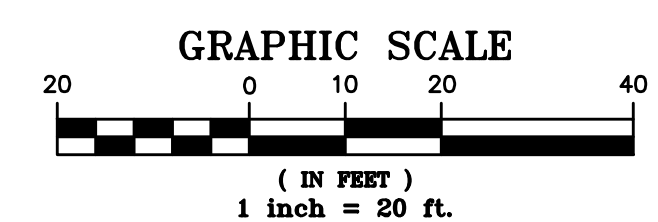
LIMITS OF DISTURBANCE

SLOPE LEGEND:



NOTE:

1. THERE WILL BE NO CONSTRUCTION IN ANY STEEP SLOPE AREAS AS DEFINED BY THE CHAPEL HILL LUMO SECTION 5.3.2-C(1).



GIMGHOUL CASTLE
 CHAPEL HILL, NORTH CAROLINA
PROPOSED SLOPE ANALYSIS

REV.	DATE	DESCRIPTION

DATE: FEBRUARY 4, 2021

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SA-2

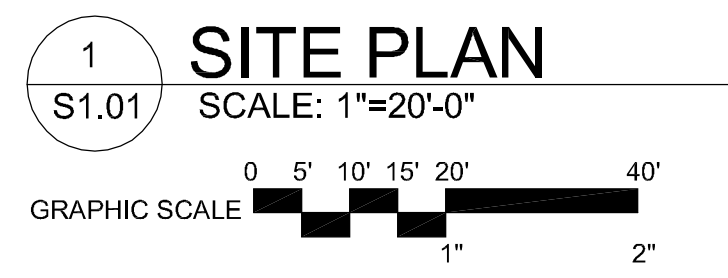


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Existing Vehicle Parking (21 total spaces)....
 including proposed Handicapped Spaces w/ Access Isle +
 Bicycle Racks to accommodate four Bicycles.

CONSTRUCTION COLOR KEY	
	PROPOSED NEW CONSTRUCTION
	PROPOSED NEW HARDSCAPE CONSTRUCTION



Edgar Toms Carr, AIA, NCARB
 c/o Robert Winston Carr, Inc./ Associated Architects
 PO Box 1692
 Durham, North Carolina 27702
 nwc.architects@frontier.com 919-688-6308 o. / 919-906-2496 c.

Addition & Renovation to...
Gimghoul Castle
 742 Gimghoul Road
 Chapel Hill, North Carolina 27514



civilconsultants

LAND DEVELOPMENT CONSULTANTS

STORMWATER IMPACT STATEMENT

Gimghoul Castle

705 Gimghoul Rd
Chapel Hill, NC 27514

February 3, 2021

Revised September 17, 2021

Revised December 7, 2021

Project # 26011



Prepared For:
Gimghoul Corporation
PO Box 3670
Chapel Hill, NC 27515R

Gimghoul Castle

Stormwater Impact Statement

Purpose

The purpose of this report is to assess stormwater impacts associated with proposed renovations of an existing historic site and building located in the Town of Chapel Hill. This analysis addresses requirements prescribed in the Town's regulations related to stormwater runoff control. Improvements to the site include interior building renovations, small building additions, a new terrace, and pedestrian improvements to the site.

Existing Site Conditions and Drainage Characteristics

The subject property is located at 742 Gimghoul Rd in Chapel Hill, and consists of approximately 2.15 acres of lightly developed property. A single structure sits on the property, with a gravel-surfaced driveway. The predominant land cover is grass lawn and forest with numerous mature trees. No stormwater runoff from offsite areas flows onto the property which is located on the crest of a hill. Runoff leaves the property in a distributed nature largely across the southern border of the site boundary. The property is not located in any floodplain area or Resource Conservation District (RCD). The subject property is located in the Jordan Lake drainage basin, and within the Town's Watershed Protection Overlay District.

Impervious Surface Area

The current site contains 24,602 ft² of existing impervious area comprised of one existing building, onsite parking, and several stone walls and walking paths. The project will remove 596 ft² of impervious and add 4,298 ft² of new impervious for a net increase of 3,702 ft².

$$24,602 \text{ ft}^2 - 596 \text{ ft}^2 + 4,298 \text{ ft}^2 = 28,304 \text{ ft}^2 \text{ Total proposed impervious area.}$$

Sedimentation and Erosion Control

The relatively small amount of disturbed area for the subject project is less than the threshold for plan review and permitting by the Orange County Sedimentation Control Office. The applicable disturbed area threshold is 20,000 sf, and the proposed disturbed area for this project is 17,750 sf. Despite having no requirement for sedimentation control plan review, the project work includes conventional measures for temporary sediment and erosion control during construction activities.

Applicability of Local Stormwater Regulations

Two areas of stormwater-related regulations appear in the Town of Chapel Hill LUMO; specifically Section 3.6.4 – Watershed Protection District and Section 5.4 – Stormwater Management. Paragraph 3.6.4 (d) (2) provides exemption from the entire 3.6.4 section for projects that do not trigger the threshold for Erosion and Sedimentation Control Review. Based on the foregoing discussion regarding this topic, the applicant claims exemption from LUMO Section 3.6.4 for this project.

Section 5.4 exemptions do not appear to apply to this project since it is not residential in nature. The relevant performance requirements for this site are:

1. Achieve 85% TSS removal from the runoff generated by the first 1” of precipitation on the new impervious added to the site.
2. Limit the 2-year 24-hour runoff volume leaving the site to the corresponding pre-development (existing conditions) level.
3. Limit the peak runoff rate leaving the site resulting from the 1-year, 2-year, and 25-year, 24-hour rainfall events to the pre-development (existing conditions) levels.

TSS Removal

An additional 3,702 sf of impervious area is proposed on the site. One inch of precipitation on the new impervious would generate 293 cubic feet of runoff required to be treated to 85% TSS. A Filtterra Bioscape device is proposed to remove 85% TSS from 5,529 sf (0.13 ac.) of existing and proposed impervious area; an area greater than the amount of net new impervious area. One inch of precipitation on the actual area draining to the proposed device would generate 574 cubic feet of runoff that will be treated to 85% TSS.

The NCDEQ Manual recommends a 4’x6’ Filtterra Bioscape unit for drainage areas up to 0.14 acres based on a Media area / Drainage Area ratio of 0.39%. Due to some concerns raised by the Town regarding the pervious area draining to the device, a more conservative ratio of 0.33% will be used.

$$5,529 \text{ ft}^2 \text{ drainage area} \times 0.33\% = 18.2 \text{ ft}^2 \text{ media area}$$

The proposed 4’x6’ Filtterra Bioscape will provide 24 ft² of media area which exceeds the media area required.

2-Year Volume Management

The estimated volume increases between 2-year pre-development and post-development conditions is 906 cubic feet as calculated by the SCS Runoff Curve Number Method provided in Exhibit 3. This volume will be entirely treated by the Filtterra Bioscape device.

The Filtterra device was modeled in Autodesk’s Hydrographs model as a stormwater control measure “pond” with an overflow spillway and a constant outflow equivalent. A 50% factor of safety has been applied to the published infiltration rate of the Filtterra media of 140 inches per hour to account for potential decrease in performance over time. An infiltration rate of 70 inches per hour has been used in all calculations.

$$\frac{70 \text{ inches}}{\text{hour}} \times \frac{1 \text{ hour}}{3600 \text{ seconds}} \times \frac{1 \text{ foot}}{12 \text{ inches}} \times [4' \times 6' \text{ Filtterra Surface Area}] = 0.039 \frac{\text{ft}^3}{\text{s}}$$

The Filtterra device is equipped with an “internal bypass” overflow standpipe riser set at 9” above the media surface. The Hydrographs model demonstrates that this design will allow the entire 1-year, post development storm event (1,420 cubic feet of runoff) to pass through the Filtterra media without staging up over the internal bypass overflow. The model output for this scenario is included in Exhibit 4.

Peak Runoff Rate

The Filtterra device and surrounding depression area in the lawn will provide sufficient detention so that the project does not increase the peak runoff rates for all regulated return intervals. The peak runoff rate calculations are provided in Exhibit 4 for the required 1-year, 2-year and 25-year; 24-hour events. These are summarized below:

	<u>Q1 (cfs)</u>		<u>Q2 (cfs)</u>		<u>Q25 (cfs)</u>	
	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>
Drainage Area:	0.70	0.43	1.28	1.01	4.54	4.28

These results demonstrate that the project does not increase the peak runoff rates for all regulated return intervals.

Conclusion

The proposed stormwater management strategy will meet Town of Chapel Hill stormwater management requirements.

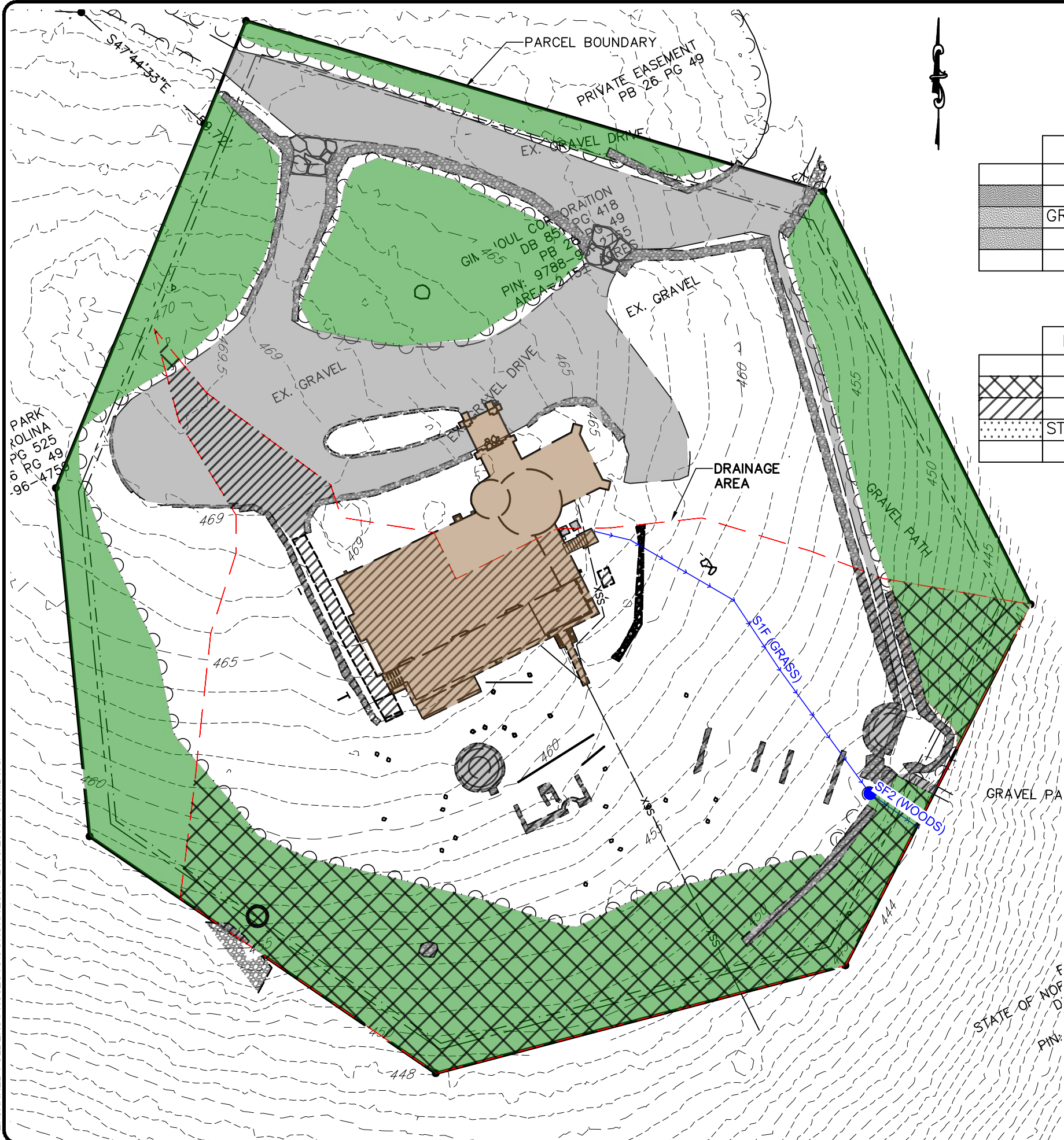
End

Exhibits

1. Drainage Area Map for Pre-Development Conditions
2. Drainage Area Map for Post-Development Conditions
3. SCS Curve Number for 2-Year Volume Analysis
4. Porch catch basin calculation
5. Peak Flow Analysis and Model Report

Exhibit 1 – Drainage Area Map for Pre-Development Conditions

Z:\SHARED FOLDERS\PROJECTS\CORONA\26011\DWG\26011 SWM.DWG



EXISTING LAND COVER	AREA (FT2)	AREA (AC.)
GRASS	37,506	0.86
FOREST	31,742	0.73
GRAVEL DRIVE AND STONE PATHS	19,133	0.44
BUILDING FOOTPRINT	5,469	0.13
TOTAL AREA	93,850	2.15

DRAINAGE AREA LAND COVER	AREA (FT2)	AREA (AC.)
GRASS	24,829	0.57
FOREST	13,676	0.31
IMPERVIOUS	7,468	0.17
STORMWATER CONTROL MEASURE	0	0
TOTAL AREA	45,973	1.06

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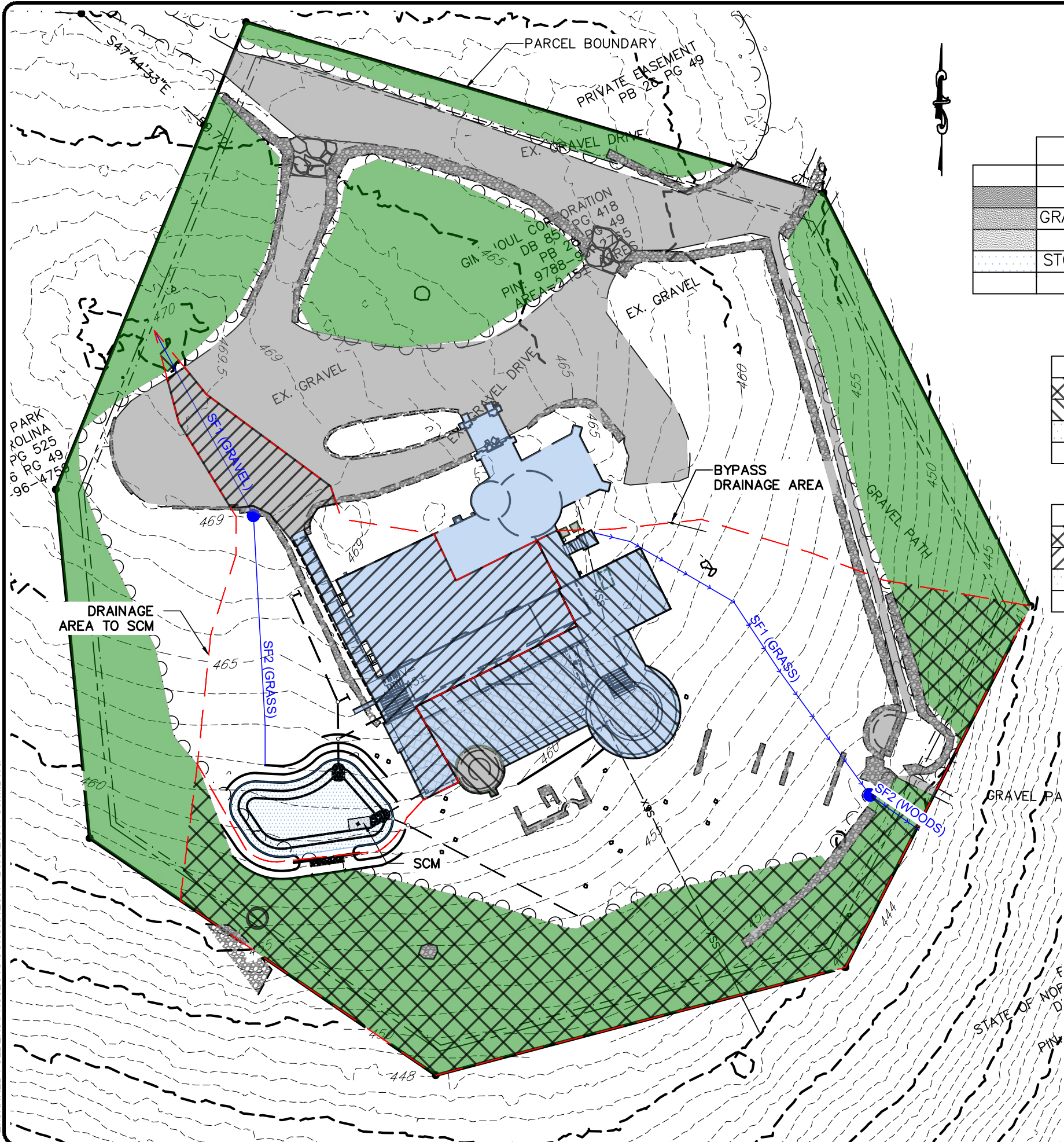
REV.	DATE	DESCRIPTION	BY

**PRE DEVELOPMENT
 DRAINAGE MAP**

DATE:	NOV 30, 2021
HORIZ. SCALE:	1" = 40'
VERT. SCALE:	N/A
PROJ. MANAGER:	MAF
DRAWN BY:	ADJ
PROJECT NO:	26011
DRAWING NAME:	26011 SWM.DWG
SHEET NO.	1

Exhibit 2 – Drainage Area Map for Post-Development Conditions

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PROPOSED LAND COVER	AREA (FT2)	AREA (AC.)
GRASS	32,871	0.75
FOREST	31,239	0.72
GRAVEL DRIVE AND STONE PATHS	18,576	0.43
BUILDING FOOTPRINT	9,730	0.22
STORMWATER CONTROL MEASURE	1,434	0.03
TOTAL AREA	93,850	2.15

BYPASS DRAINAGE AREA	AREA (FT2)	AREA (AC.)
GRASS	16,165	0.37
FOREST	13,123	0.30
IMPERVIOUS	4,200	0.10
SCM	0	0
TOTAL AREA	33,488	0.77

DRAINAGE AREA TO SCM	AREA (FT2)	AREA (AC.)
GRASS	5,529	0.13
FOREST	48	0.00
IMPERVIOUS	5,468	0.13
SCM	1,434	0.03
TOTAL AREA	12,479	0.29

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REV.	DATE	DESCRIPTION	BY

**POST DEVELOPMENT
DRAINAGE MAP**

DATE:	NOV 30, 2021
HORIZ. SCALE:	1" = 40'
VERT. SCALE:	N/A
PROJ. MANAGER:	MAF
DRAWN BY:	ADJ
PROJECT NO:	26011
DRAWING NAME:	26011 SWM.DWG
SHEET NO.	2

Exhibit 3 – SCS Curve Number for 2-Year Volume Analysis

Pre Development Curve Number					
Catchment	Area (ac.)	LandCover	HSG	Curve Number	Composite CN
Site	0.86	Grass (Good)	B	61	52.5
Site	0.73	Forest (Good)	B	55	40.1
Site	0.56	Impervious	B	98	55.3
Site	0.00	SCM	B	98	0.0
TOTAL Site	2.15				68.7

Post Development Curve Number					
Catchment	Area (ac.)	LandCover	HSG	Curve Number	Composite CN
Site	0.75	Grass (Good)	B	61	46.0
Site	0.72	Forest (Good)	B	55	39.4
Site	0.65	Impervious	B	98	63.7
Site	0.03	SCM	B	98	3.2
TOTAL Site	2.15				70.7

Pre Development 2-yr Runoff Volume	
3.60	Rainfall (in)
68.7	Curve Number
4.56	S
0.91	Initial Abstraction (Ia)
1.00	Runoff (Q) inches
7,792	Runoff Volume (ft³)

Post Development 2-yr Runoff Volume	
3.60	Rainfall (in)
70.7	Curve Number
4.14	S
0.83	Initial Abstraction (Ia)
1.11	Runoff (Q) inches
8,697	Runoff Volume (ft³)

Required 2-year Detention Volume:	906
-----------------------------------	------------

Runoff Generated by 1" of precipitation on new impervious (simple method)

Ia (Impervious Fraction)	1.00
Rd (Rainfall Depth)	1.0 inches
Rv (Runoff Volume)	0.95
A (Area)	3,702.00 ft ²
DV (Design Volume)	293 ft ³

Drainage Area to SCM

Land Cover	Area (ft ²)	Area (ac.)
Impervious	5,529	0.13
Forest	48	0.00
Grass	5,468	0.13
SCM	1,434	0.03
TOTAL	12,479	0.29

Runoff Generated by 1" of precipitation on actual SCM Drainage Area (simple method)

Ia (Impervious Fraction)	0.56
Rd (Rainfall Depth)	1.0 inches
Rv (Runoff Volume)	0.55
A (Area)	0.29 ft ²
DV (Design Volume)	574 ft ³

Exhibit 4 – Porch catch basin calculation

STRUCTURE	ZONE	LAND COVER	AREA (Ac)	C-VALUE	% OF TOTAL	$C_{increment}$
SCM	1	Impervious	0.013	0.96	100.0%	0.960
	2	Grass	0.000	0.50	0.0%	0.000
	3	Woods	<u>0.000</u>	0.40	<u>0.0%</u>	<u>0.000</u>
Area =			0.013		100.0%	
$C_{composite} =$			0.96			

1yr Q	2yr Q	10yr Q	
I (intensity)	4.5	5.76	7.22
Q (Flow)	0.05	0.07	0.09

Inlet Report

<Name>

Drop Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 0.56
Grate Width (ft)	= 0.75
Grate Length (ft)	= 0.75

Gutter

Slope, Sw (ft/ft)	= 0.020
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= -0-
Gutter Width (ft)	= 1.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 0.10

Highlighted

Q Total (cfs)	= 0.10
Q Capt (cfs)	= 0.10
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 0.60
Efficiency (%)	= 100
Gutter Spread (ft)	= 5.97
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-

All dimensions in feet

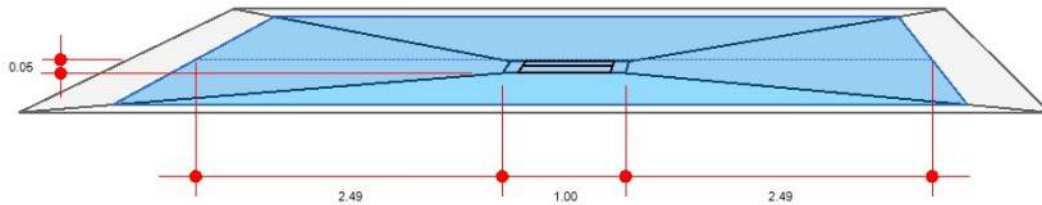


Exhibit 5 – Peak Flow Analysis and Model Report

Pre Development Drainage Area Curve Number					
Catchment	Area (ac.)	LandCover	HSG	Curve Number	Composite CN
Site	0.57	Grass (Good)	B	61	34.8
Site	0.31	Forest (Good)	B	55	17.3
Site	0.17	Impervious	B	98	16.8
Site	0.00	SCM	B	98	0.0
TOTAL Site	1.06				65.2

Post Development Drainage Area To SCM Curve Number					
Catchment	Area (ac.)	LandCover	HSG	Curve Number	Composite CN
Site	0.13	Grass (Good)	B	61	7.7
Site	0.00	Forest (Good)	B	55	0.1
Site	0.13	Impervious	B	98	12.3
Site	0.03	SCM	B	98	3.2
TOTAL Site	0.29				81.4

Post Development Bypass Drainage Area Curve Number					
Catchment	Area (ac.)	LandCover	HSG	Curve Number	Composite CN
Site	0.37	Grass (Good)	B	61	22.6
Site	0.30	Forest (Good)	B	55	16.6
Site	0.10	Impervious	B	98	9.4
Site	0.00	SCM	B	98	0.0
TOTAL Site	0.77				63.3

Time of Concentration Calculations

2-year, 24-hour rainfall depth (in.) 3.6

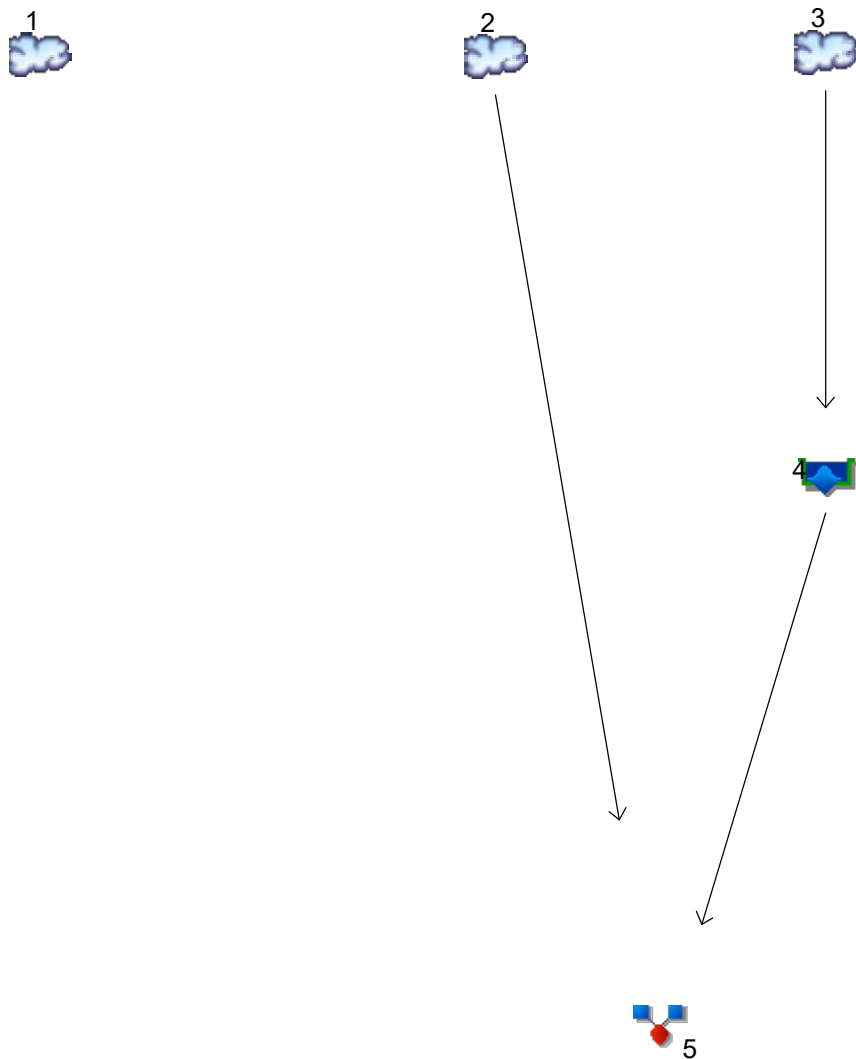
Pre Development Time of Concentration								
Label	Flow Regime	Length	Land Cover	Roughness	Start Elev.	End Elev.	Average Slope	Time (min)
SF1	Sheet Flow	141	Grass	0.15	464.0	450.0	0.10	6.41
SF2	Sheet Flow	21	Woods (Light)	0.4	450.0	445.0	0.24	2.16
Pre-Dev								8.56

Post Development Time of Concentration								
Catchment	Flow Regime	Length	Land Cover	Roughness	Start Elev.	End Elev.	Average Slope	Time (min)
SF1	Sheet Flow	75	Gravel	0.011	470.0	469.0	0.01	1.07
SF2	Sheet Flow	90	Grass	0.15	469.0	462.0	0.08	4.93
Post								6.00

Catchment	Flow Regime	Length	Land Cover	Roughness	Start Elev.	End Elev.	Average Slope	Time (min)
SF1	Sheet Flow	141	Grass	0.15	464.0	450.0	0.10	6.41
SF2	Sheet Flow	21	Woods (Light)	0.4	450.0	445.0	0.24	2.16
Post Bypass								8.56

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020



Legend

<u>Hyd. Origin</u>	<u>Description</u>
1	SCS Runoff Pre-A
2	SCS Runoff Post-A bypass
3	SCS Runoff Site
4	Reservoir FILTERRA
5	Combine Post-A

Hydrograph Return Period Recap

Hydroflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	0.696	1.279	-----	-----	-----	4.543	-----	6.663	Pre-A
2	SCS Runoff	-----	0.404	0.795	-----	-----	-----	3.075	-----	4.574	Post-A bypass
3	SCS Runoff	-----	0.707	0.977	-----	-----	-----	2.233	-----	2.957	Site
4	Reservoir	3	0.057	0.328	-----	-----	-----	1.247	-----	1.513	FILTERRA
5	Combine	2, 4	0.443	1.005	-----	-----	-----	4.283	-----	6.040	Post-A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.696	1	721	1,906	----	----	----	Pre-A
2	SCS Runoff	0.404	1	721	1,192	----	----	----	Post-A bypass
3	SCS Runoff	0.707	1	718	1,420	----	----	----	Site
4	Reservoir	0.057	1	752	1,420	3	458.73	593	FILTERRA
5	Combine	0.443	1	721	2,613	2, 4	----	----	Post-A

Total Volume passing through Filterra in 1 yr. storm.

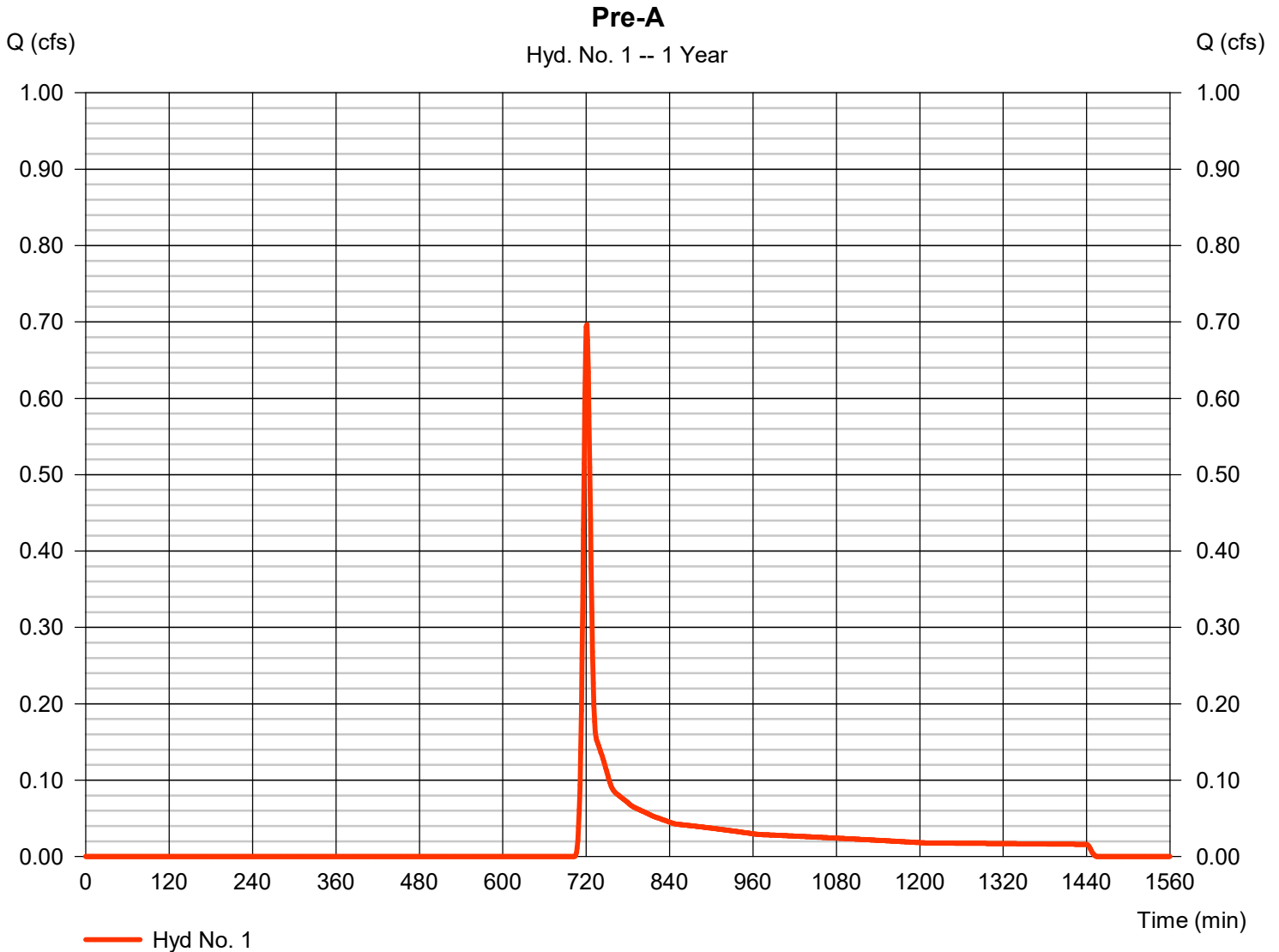
The maximum ponding elevation gets to 458.73 and the internal bypass overflow device is set at 458.75'.

Hydrograph Report

Hyd. No. 1

Pre-A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.696 cfs
Storm frequency	= 1 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 1,906 cuft
Drainage area	= 1.060 ac	Curve number	= 65.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.60 min
Total precip.	= 2.96 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

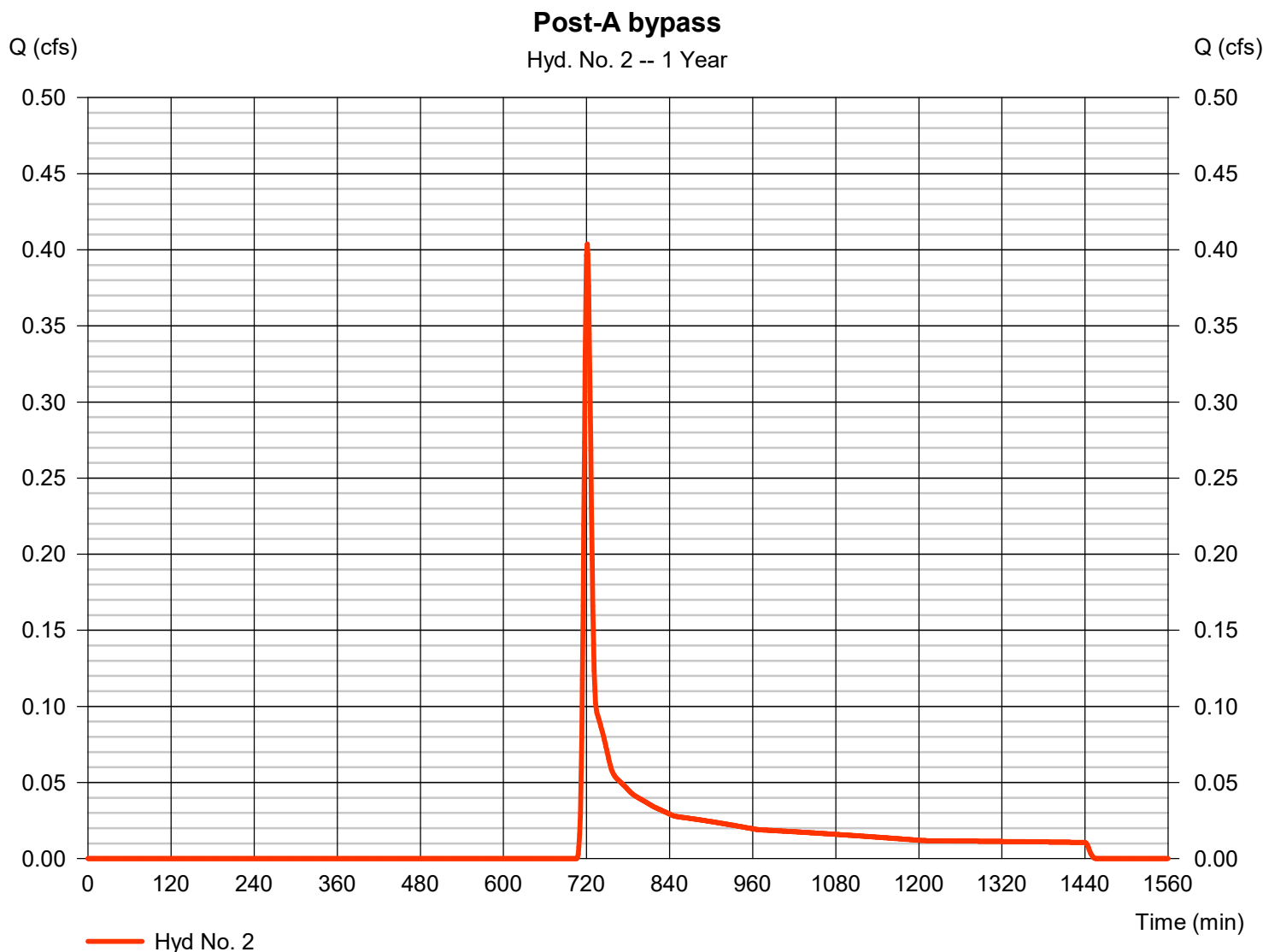
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 2

Post-A bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 0.404 cfs
Storm frequency	= 1 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 1,192 cuft
Drainage area	= 0.770 ac	Curve number	= 63.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.60 min
Total precip.	= 2.96 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

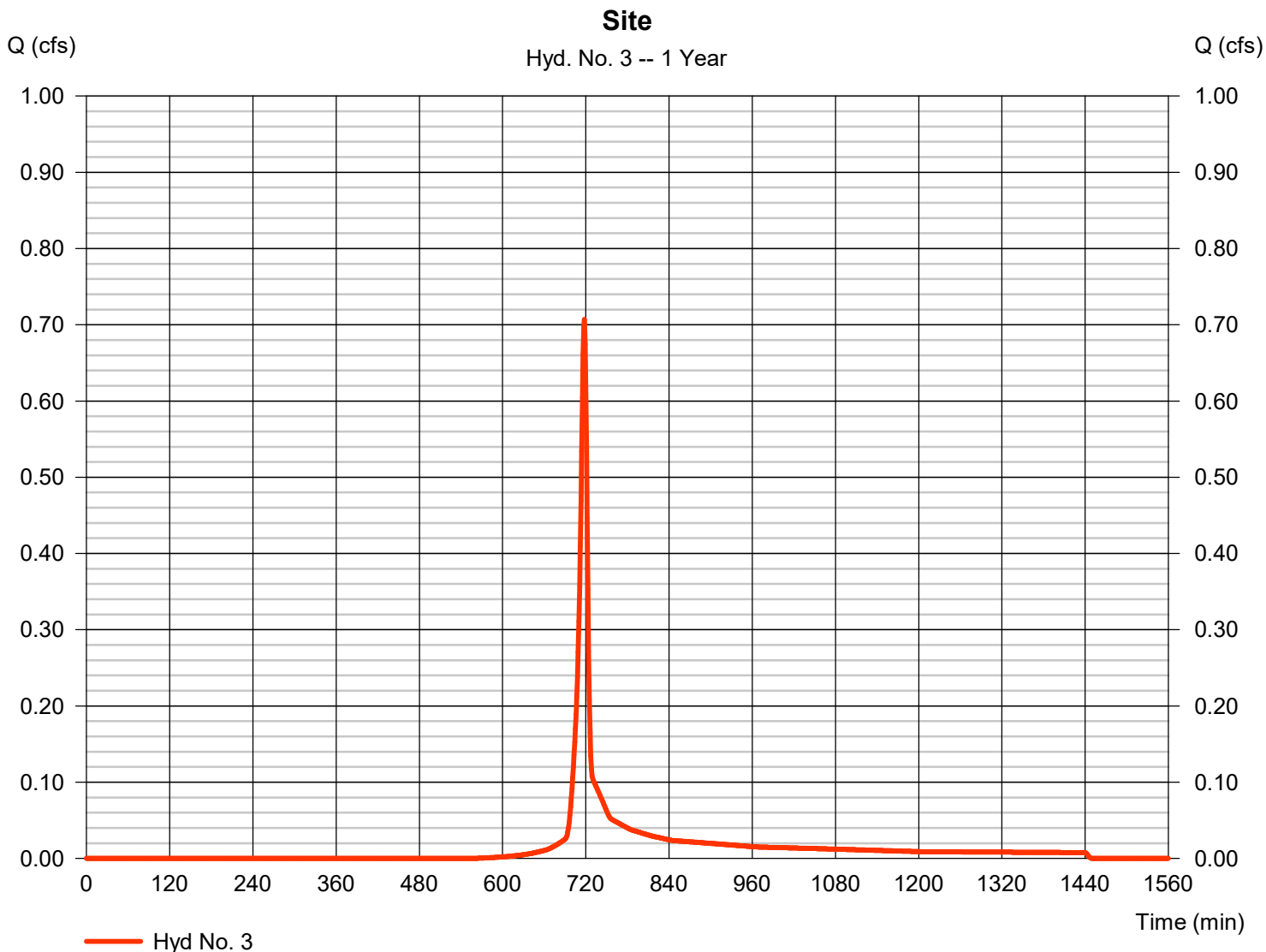
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 3

Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.707 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 1,420 cuft
Drainage area	= 0.290 ac	Curve number	= 81.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.96 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

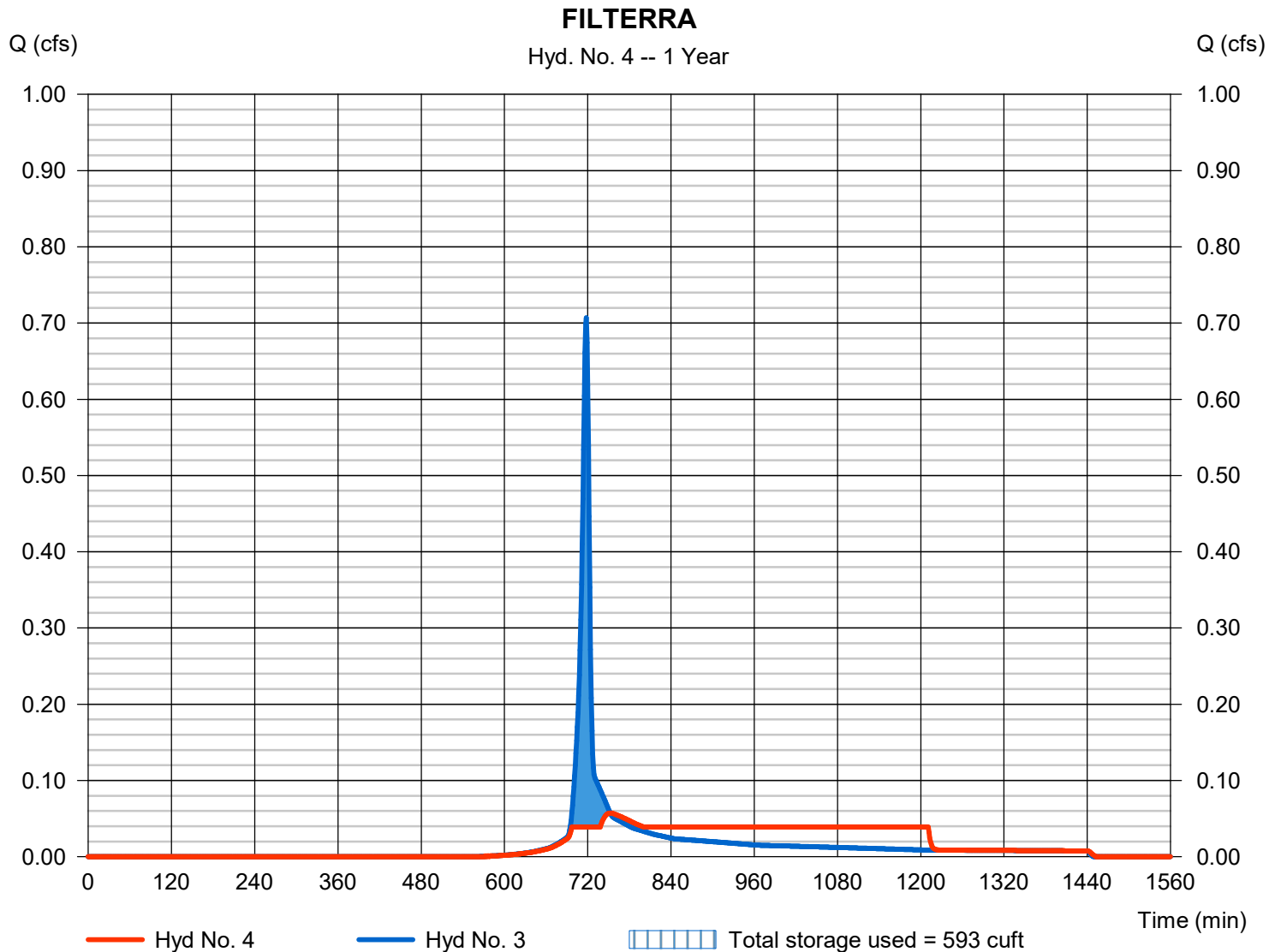
Tuesday, 12 / 7 / 2021

Hyd. No. 4

FILTERRA

Hydrograph type	= Reservoir	Peak discharge	= 0.057 cfs
Storm frequency	= 1 yrs	Time to peak	= 752 min
Time interval	= 1 min	Hyd. volume	= 1,420 cuft
Inflow hyd. No.	= 3 - Site	Max. Elevation	= 458.73 ft
Reservoir name	= FILTERRA	Max. Storage	= 593 cuft

Storage Indication method used.



Pond No. 1 - FILTERRA

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Beging Elevation = 458.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	458.00	644	0	0
0.01	458.01	645	6	6
1.00	459.00	1,010	812	819
1.50	459.50	1,215	555	1,374
2.00	460.00	1,430	660	2,035

Internal bypass standpipe riser.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 6.00	Inactive	Inactive	Inactive
Span (in)	= 6.00	2.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 96.00	100.00	0.00	0.00
Length (ft)	= 70.00	4.00	0.00	0.00
Slope (%)	= 0.09	1.00	0.00	n/a
N-Value	= .011	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 2.09	Inactive	Inactive	Inactive
Crest El. (ft)	= 458.75	450.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Constant outflow for Filterra unit media infiltration rate.

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	458.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.00	1	458.00	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.004	0.004
0.00	1	458.00	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.008	0.008
0.00	2	458.00	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.012	0.012
0.00	3	458.00	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.016	0.016
0.01	3	458.01	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.019	0.019
0.01	4	458.01	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.023	0.023
0.01	5	458.01	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.027	0.027
0.01	5	458.01	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.031	0.031
0.01	6	458.01	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.035	0.035
0.01	6	458.01	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.039	0.039
0.11	88	458.11	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.039	0.039
0.21	169	458.21	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.039	0.039
0.31	250	458.31	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.039	0.039
0.41	331	458.41	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.039	0.039
0.51	413	458.51	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.039	0.039
0.60	494	458.60	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.039	0.039
0.70	575	458.70	12.89 oc	0.00	---	---	0.00	0.00	---	---	---	0.039	0.039
0.80	656	458.80	12.89 oc	0.00	---	---	0.08	0.00	---	---	---	0.039	0.121
0.90	738	458.90	12.89 oc	0.00	---	---	0.41	0.00	---	---	---	0.039	0.447
1.00	819	459.00	12.89 oc	0.00	---	---	0.87	0.00	---	---	---	0.039	0.909
1.05	874	459.05	12.89 oc	0.00	---	---	0.80 ic	0.00	---	---	---	0.039	0.843
1.10	930	459.10	12.89 oc	0.00	---	---	0.87 ic	0.00	---	---	---	0.039	0.907
1.15	985	459.15	12.89 oc	0.00	---	---	0.93 ic	0.00	---	---	---	0.039	0.967
1.20	1,041	459.20	12.89 oc	0.00	---	---	0.98 ic	0.00	---	---	---	0.039	1.024
1.25	1,097	459.25	12.89 oc	0.00	---	---	1.04 ic	0.00	---	---	---	0.039	1.077
1.30	1,152	459.30	12.89 oc	0.00	---	---	1.09 ic	0.00	---	---	---	0.039	1.127
1.35	1,208	459.35	12.89 oc	0.00	---	---	1.14 ic	0.00	---	---	---	0.039	1.176
1.40	1,263	459.40	12.89 oc	0.00	---	---	1.18 ic	0.00	---	---	---	0.039	1.222
1.45	1,319	459.45	12.89 oc	0.00	---	---	1.23 ic	0.00	---	---	---	0.039	1.267
1.50	1,374	459.50	12.89 oc	0.00	---	---	1.27 ic	0.00	---	---	---	0.039	1.310
1.55	1,440	459.55	12.89 oc	0.00	---	---	1.31 ic	0.00	---	---	---	0.039	1.352
1.60	1,506	459.60	12.89 oc	0.00	---	---	1.35 ic	0.00	---	---	---	0.039	1.392
1.65	1,572	459.65	12.89 oc	0.00	---	---	1.39 ic	0.00	---	---	---	0.039	1.431
1.70	1,638	459.70	12.89 oc	0.00	---	---	1.43 ic	0.00	---	---	---	0.039	1.470
1.75	1,704	459.75	12.89 oc	0.00	---	---	1.47 ic	0.00	---	---	---	0.039	1.507
1.80	1,771	459.80	12.89 oc	0.00	---	---	1.50 ic	0.00	---	---	---	0.039	1.543
1.85	1,837	459.85	12.89 oc	0.00	---	---	1.54 ic	0.00	---	---	---	0.039	1.578

Continues on next page...

FILTERRA

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.90	1,903	459.90	12.89 oc	0.00	---	---	1.57 ic	0.00	---	---	---	0.039	1.613
1.95	1,969	459.95	12.89 oc	0.00	---	---	1.61 ic	0.00	---	---	---	0.039	1.647
2.00	2,035	460.00	12.89 oc	0.00	---	---	1.64 ic	0.00	---	---	---	0.039	1.680

...End

Hydrograph Report

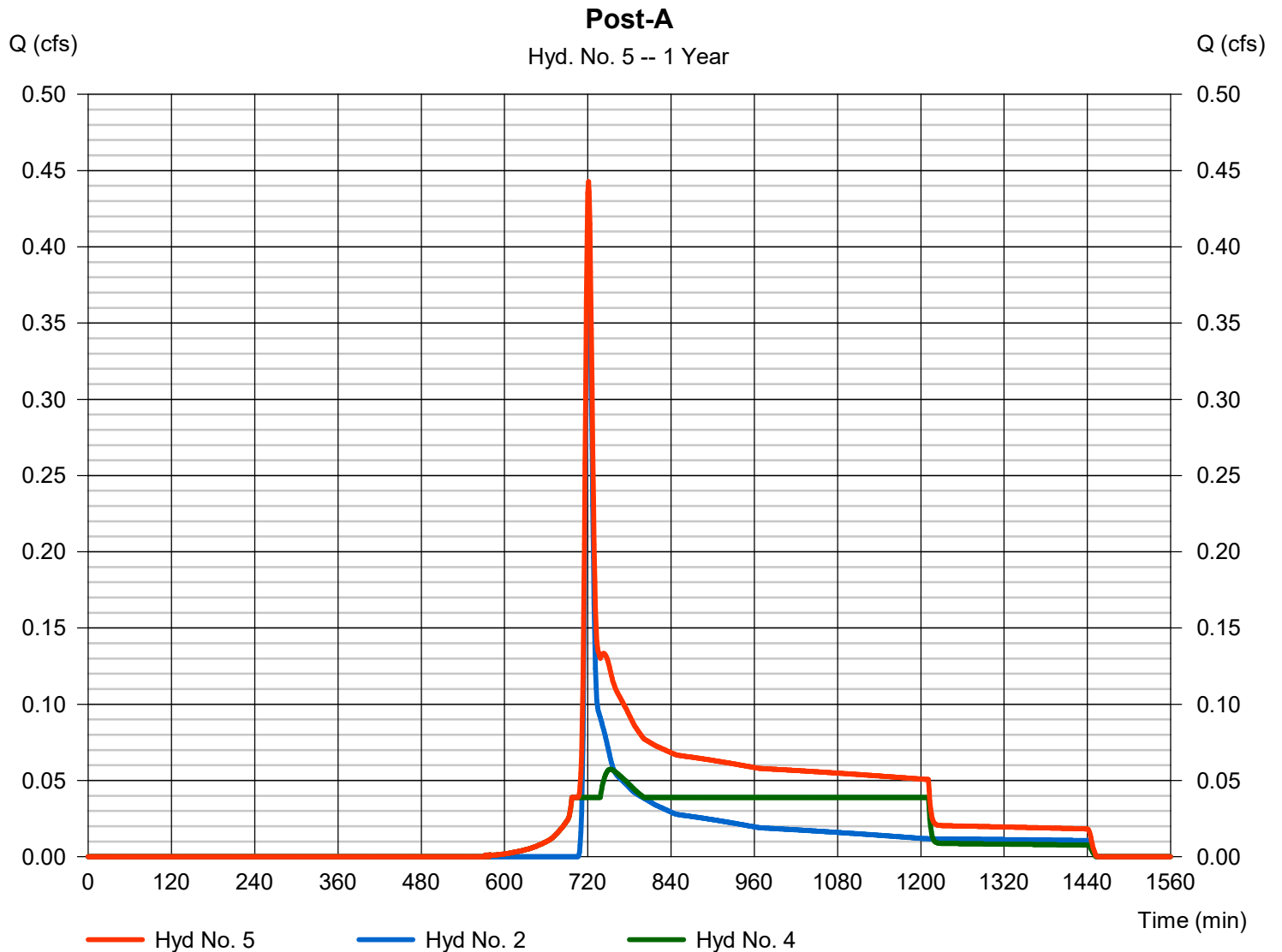
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 5

Post-A

Hydrograph type	= Combine	Peak discharge	= 0.443 cfs
Storm frequency	= 1 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 2,613 cuft
Inflow hyds.	= 2, 4	Contrib. drain. area	= 0.770 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

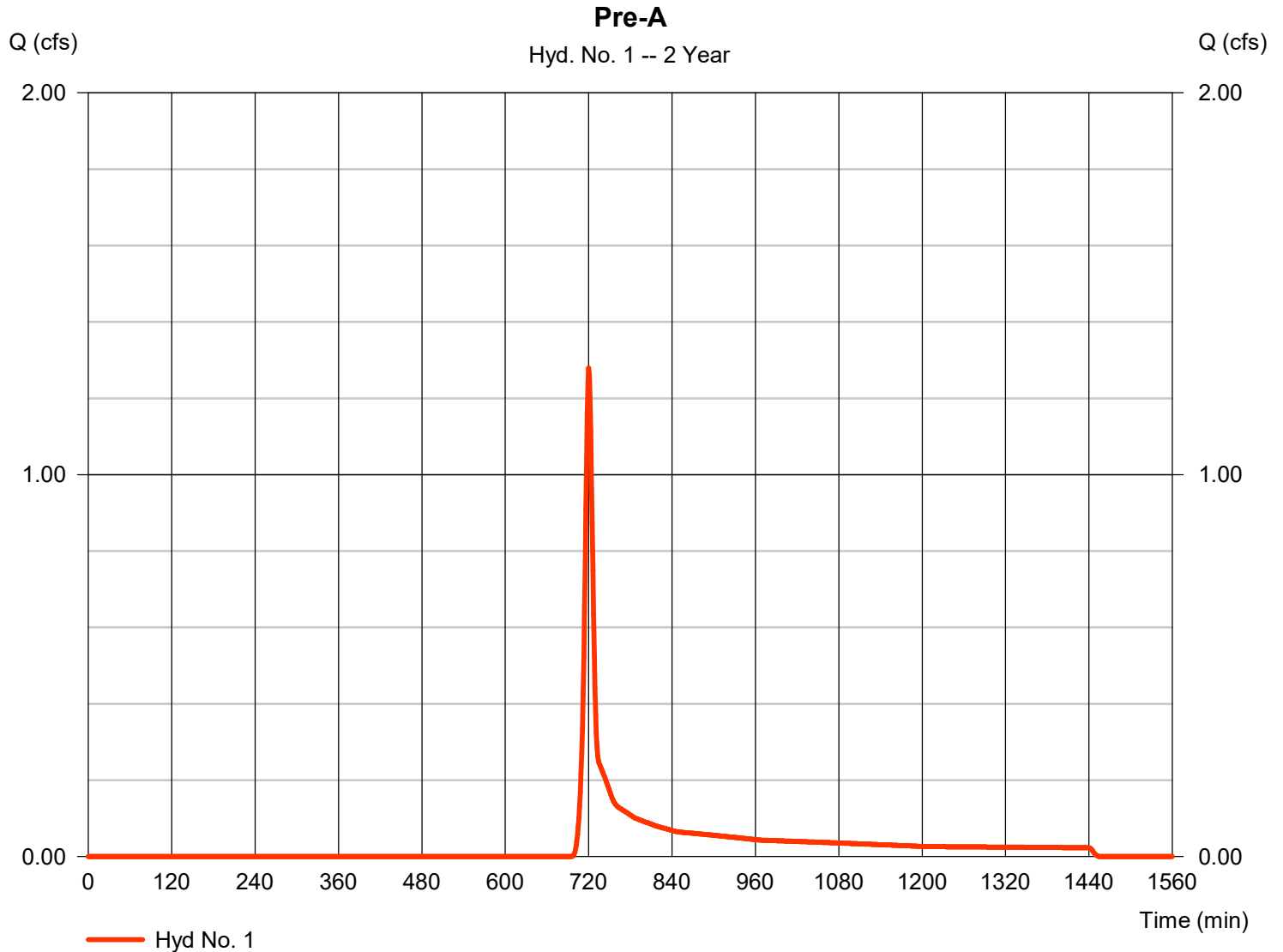
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	1.279	1	720	3,136	-----	-----	-----	Pre-A	
2	SCS Runoff	0.795	1	720	2,021	-----	-----	-----	Post-A bypass	
3	SCS Runoff	0.977	1	718	1,976	-----	-----	-----	Site	
4	Reservoir	0.328	1	724	1,975	3	458.87	708	FILTERRA	
5	Combine	1.005	1	723	3,996	2, 4	-----	-----	Post-A	
26011_Hydrographs2021.11.30.gpw					Return Period: 2 Year			Tuesday, 12 / 7 / 2021		

Hydrograph Report

Hyd. No. 1

Pre-A

Hydrograph type	= SCS Runoff	Peak discharge	= 1.279 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 1 min	Hyd. volume	= 3,136 cuft
Drainage area	= 1.060 ac	Curve number	= 65.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.60 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

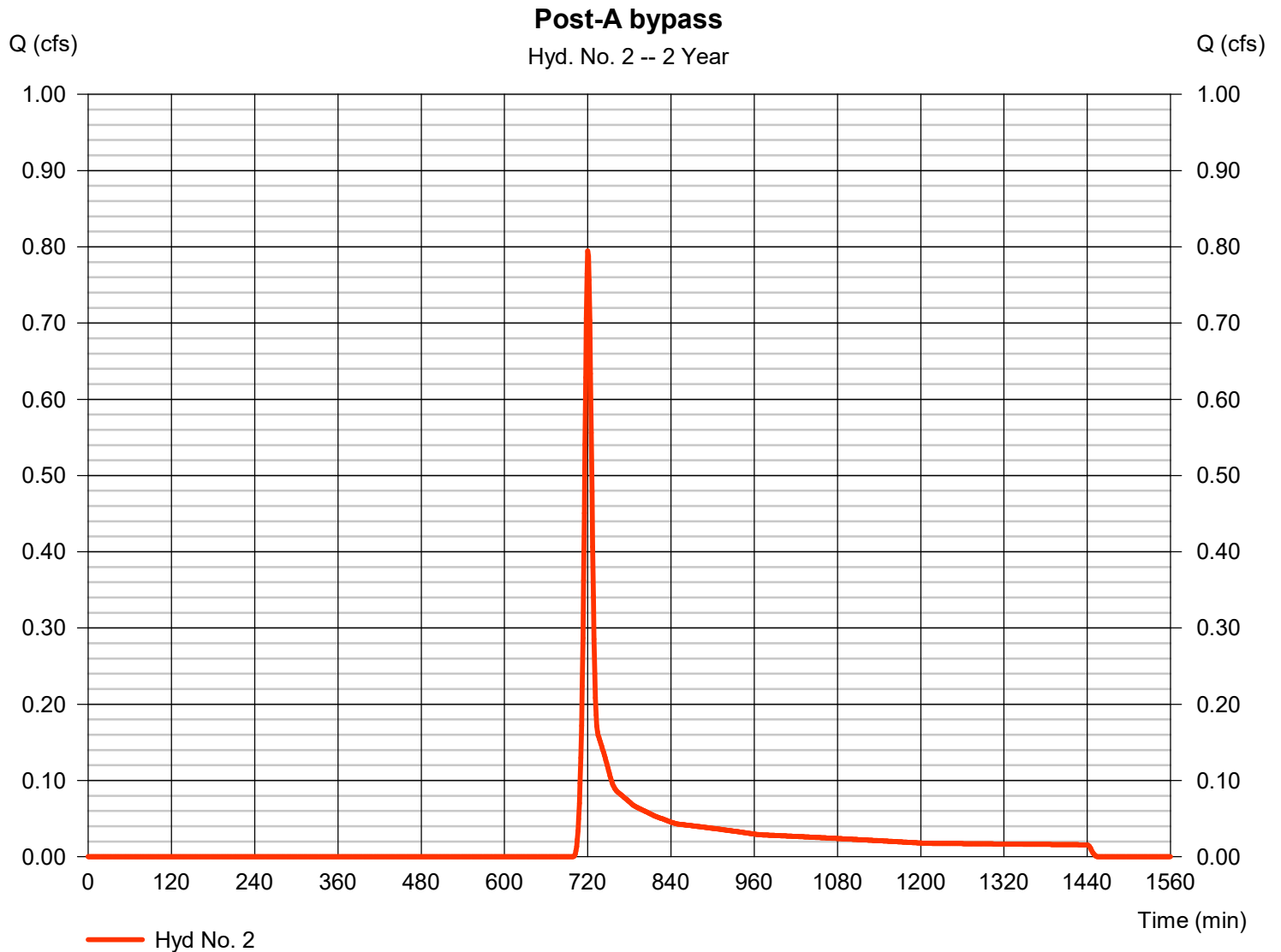
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 2

Post-A bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 0.795 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 1 min	Hyd. volume	= 2,021 cuft
Drainage area	= 0.770 ac	Curve number	= 63.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.60 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

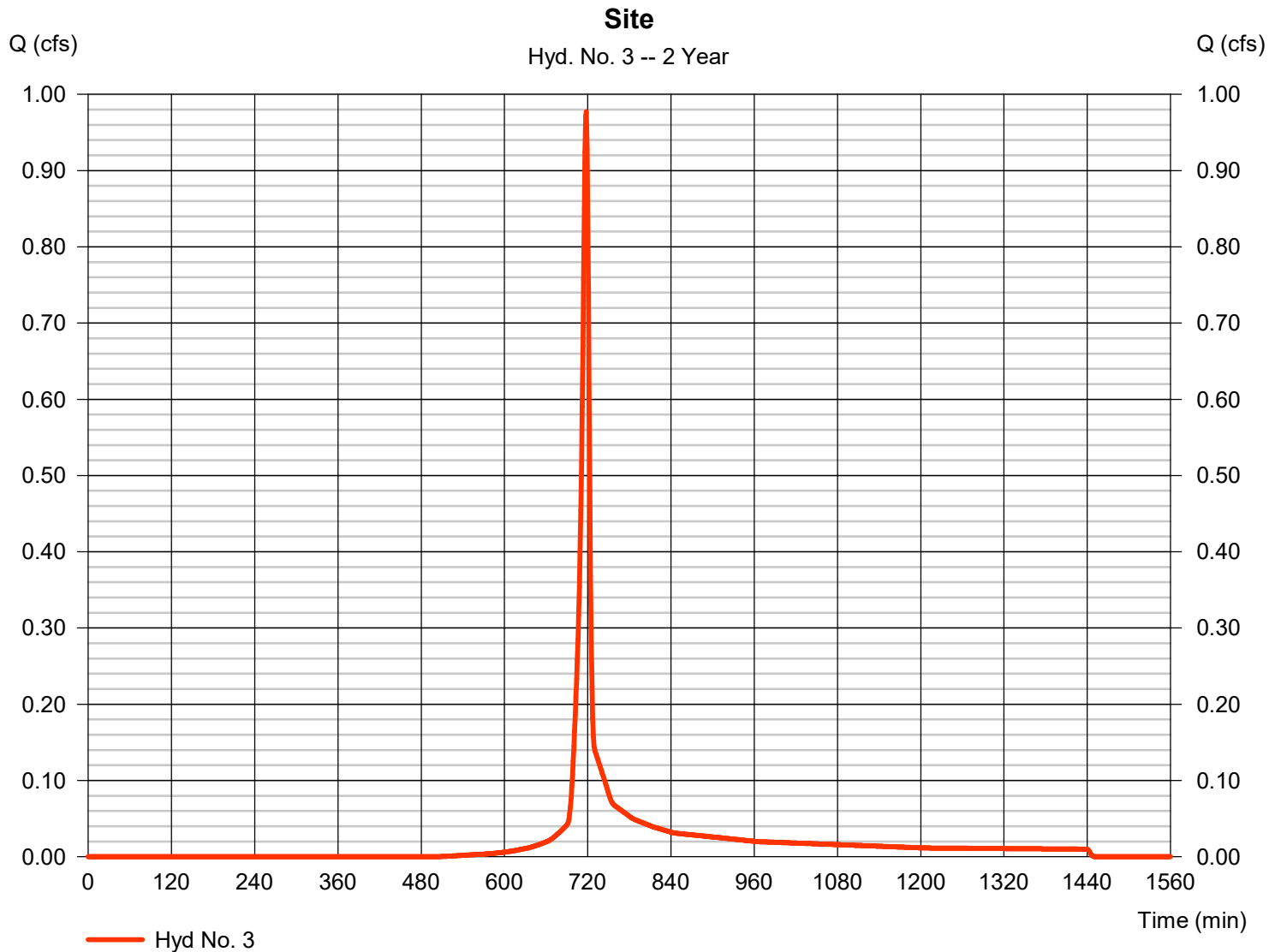
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 3

Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.977 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 1,976 cuft
Drainage area	= 0.290 ac	Curve number	= 81.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

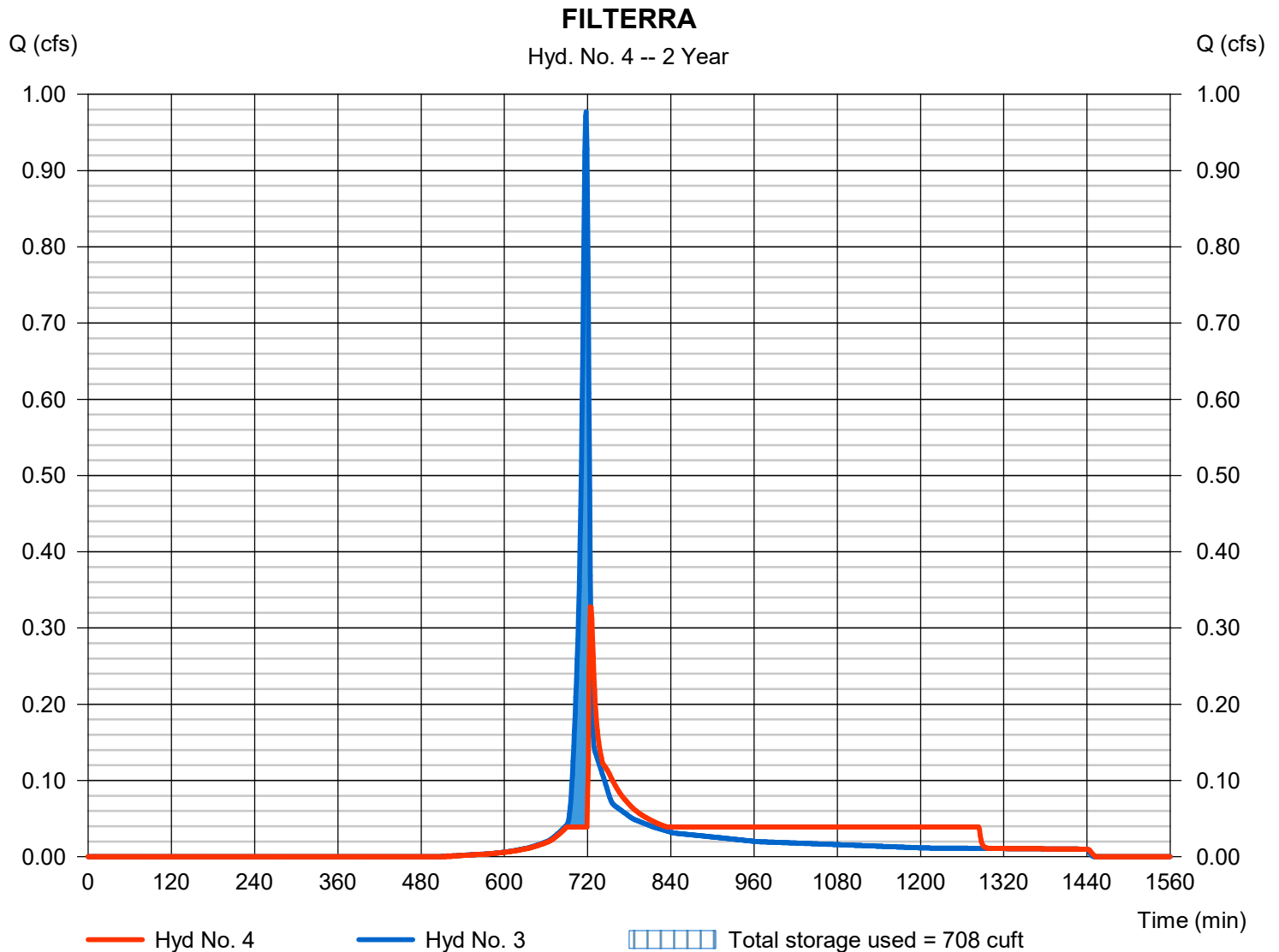
Tuesday, 12 / 7 / 2021

Hyd. No. 4

FILTERRA

Hydrograph type	= Reservoir	Peak discharge	= 0.328 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 1 min	Hyd. volume	= 1,975 cuft
Inflow hyd. No.	= 3 - Site	Max. Elevation	= 458.87 ft
Reservoir name	= FILTERRA	Max. Storage	= 708 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

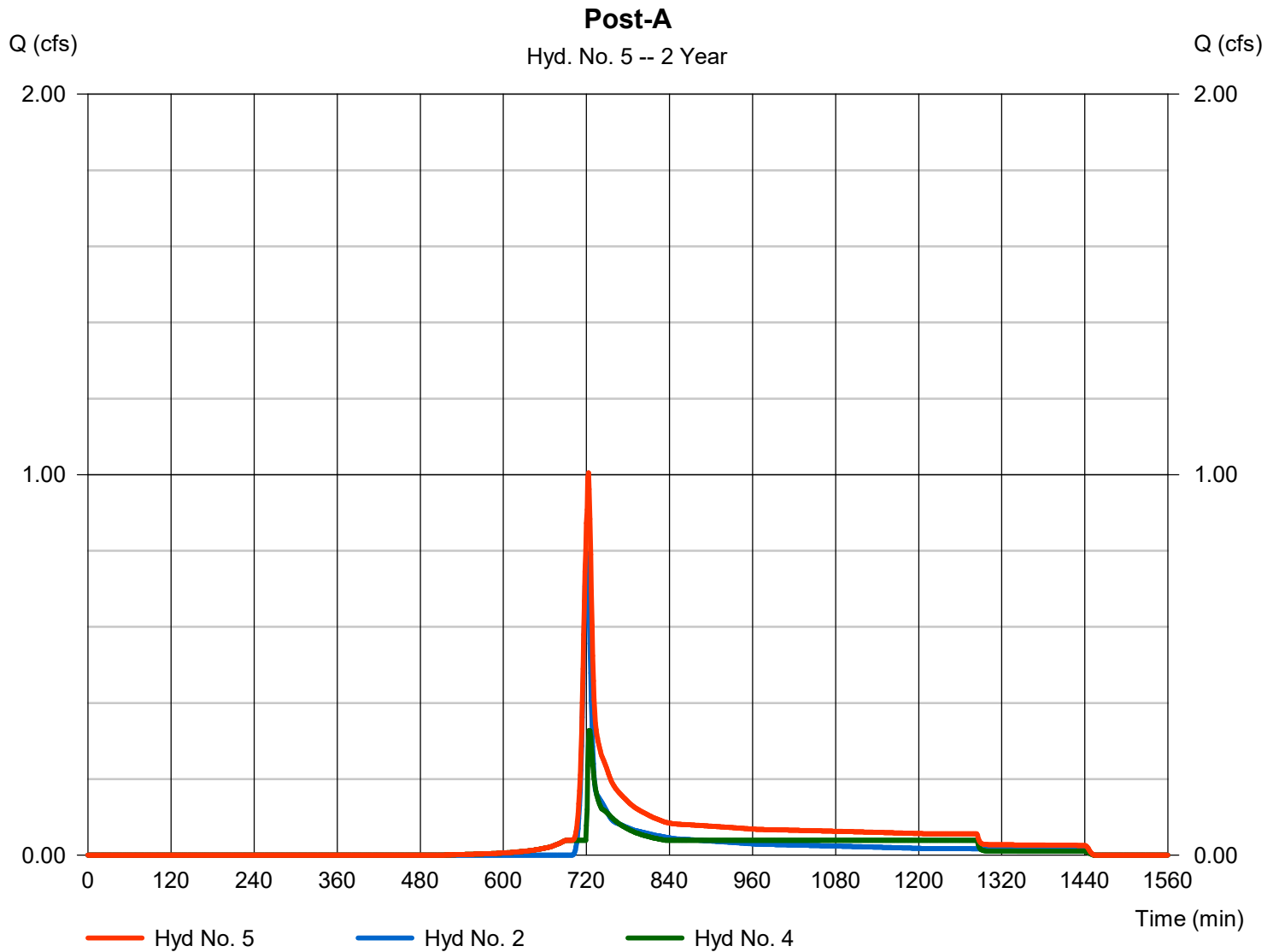
Tuesday, 12 / 7 / 2021

Hyd. No. 5

Post-A

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 2, 4

Peak discharge = 1.005 cfs
Time to peak = 723 min
Hyd. volume = 3,996 cuft
Contrib. drain. area = 0.770 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	4.543	1	720	10,283	-----	-----	-----	Pre-A	
2	SCS Runoff	3.075	1	720	6,974	-----	-----	-----	Post-A bypass	
3	SCS Runoff	2.233	1	717	4,670	-----	-----	-----	Site	
4	Reservoir	1.247	1	722	4,670	3	459.43	1,295	FILTERRA	
5	Combine	4.283	1	720	11,644	2, 4	-----	-----	Post-A	
26011_Hydrographs2021.11.30.gpw					Return Period: 25 Year			Tuesday, 12 / 7 / 2021		

Hydrograph Report

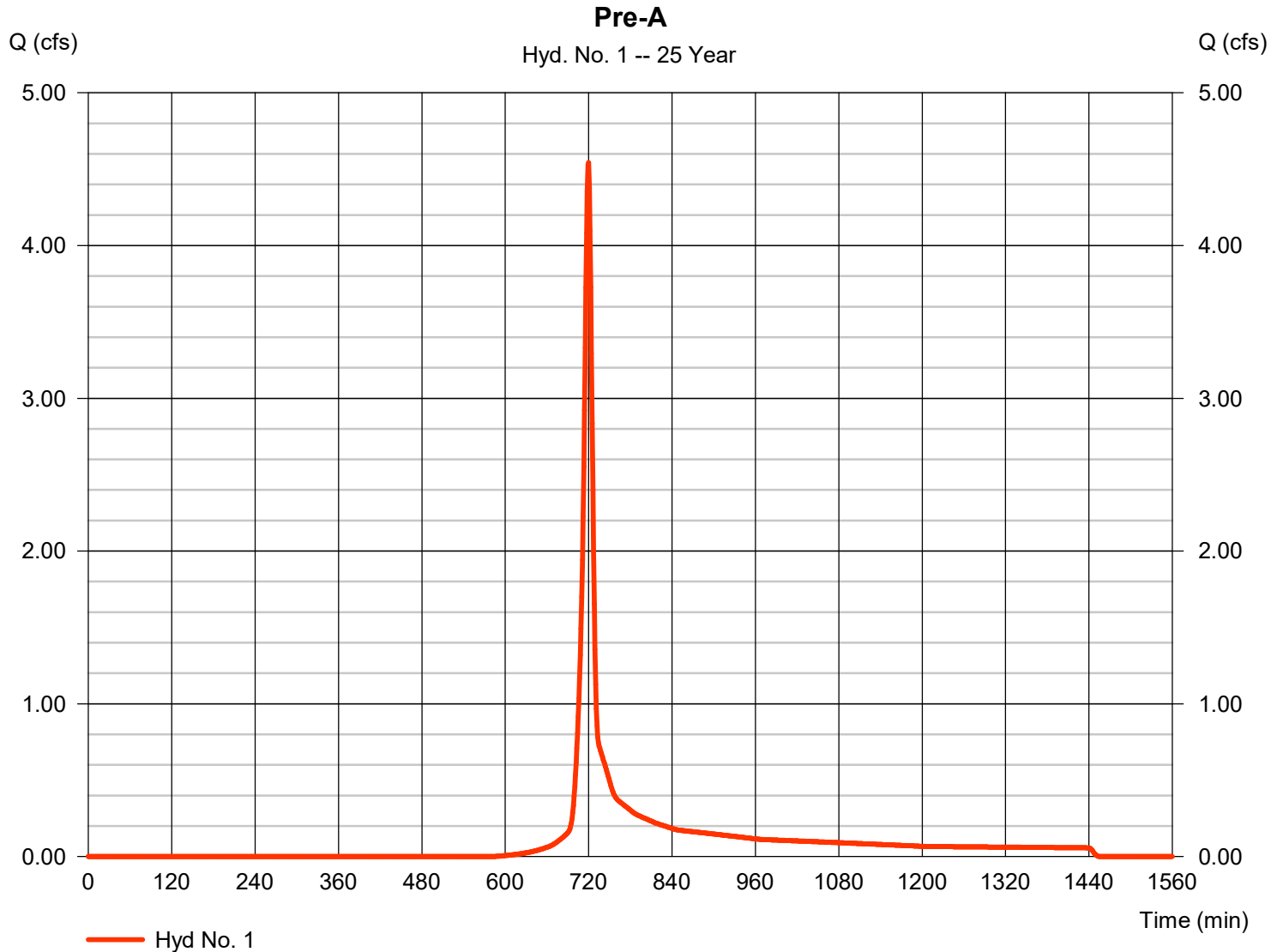
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 1

Pre-A

Hydrograph type	= SCS Runoff	Peak discharge	= 4.543 cfs
Storm frequency	= 25 yrs	Time to peak	= 720 min
Time interval	= 1 min	Hyd. volume	= 10,283 cuft
Drainage area	= 1.060 ac	Curve number	= 65.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.60 min
Total precip.	= 6.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

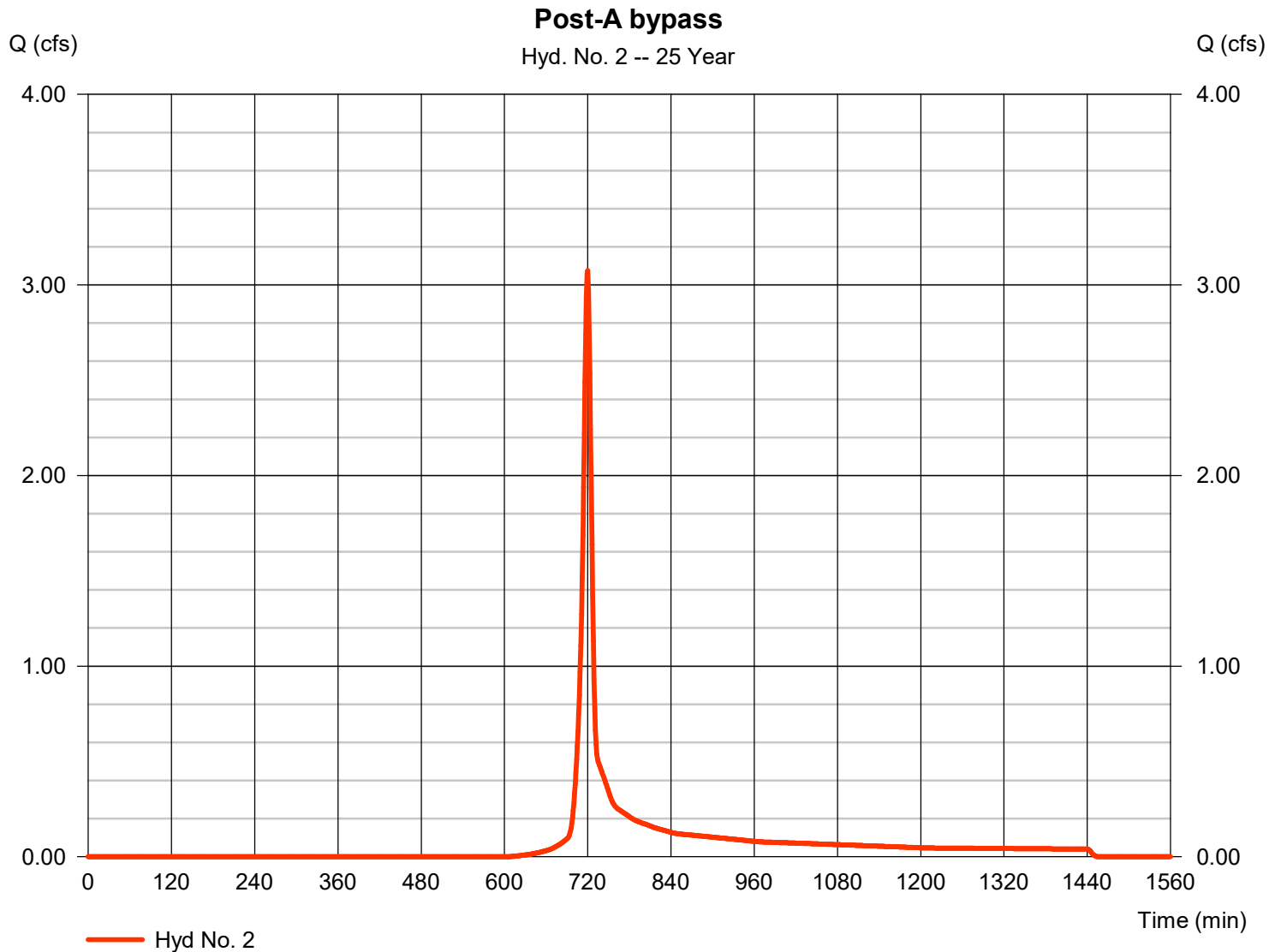
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 2

Post-A bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 3.075 cfs
Storm frequency	= 25 yrs	Time to peak	= 720 min
Time interval	= 1 min	Hyd. volume	= 6,974 cuft
Drainage area	= 0.770 ac	Curve number	= 63.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.60 min
Total precip.	= 6.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

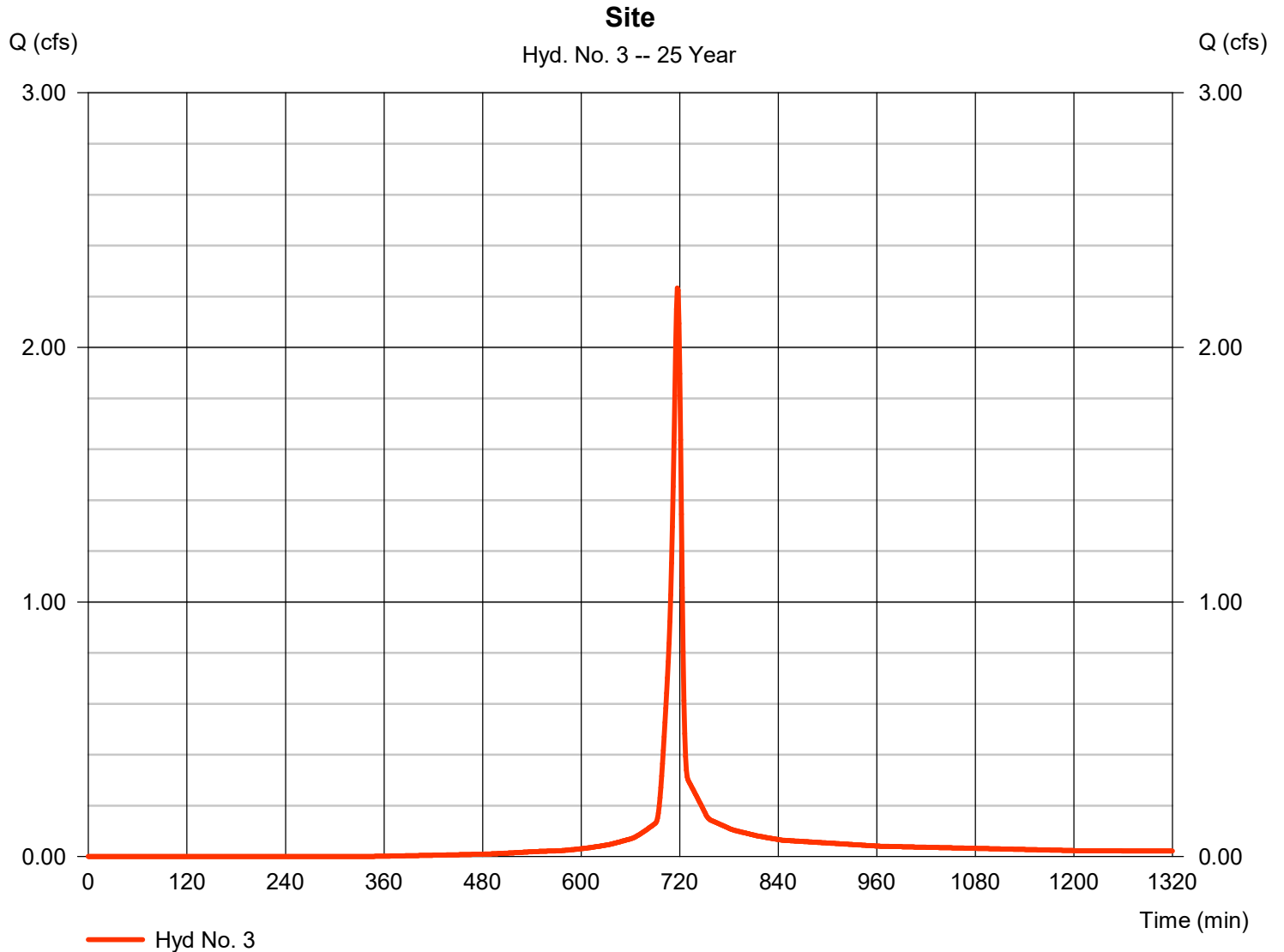
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 3

Site

Hydrograph type	= SCS Runoff	Peak discharge	= 2.233 cfs
Storm frequency	= 25 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 4,670 cuft
Drainage area	= 0.290 ac	Curve number	= 81.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

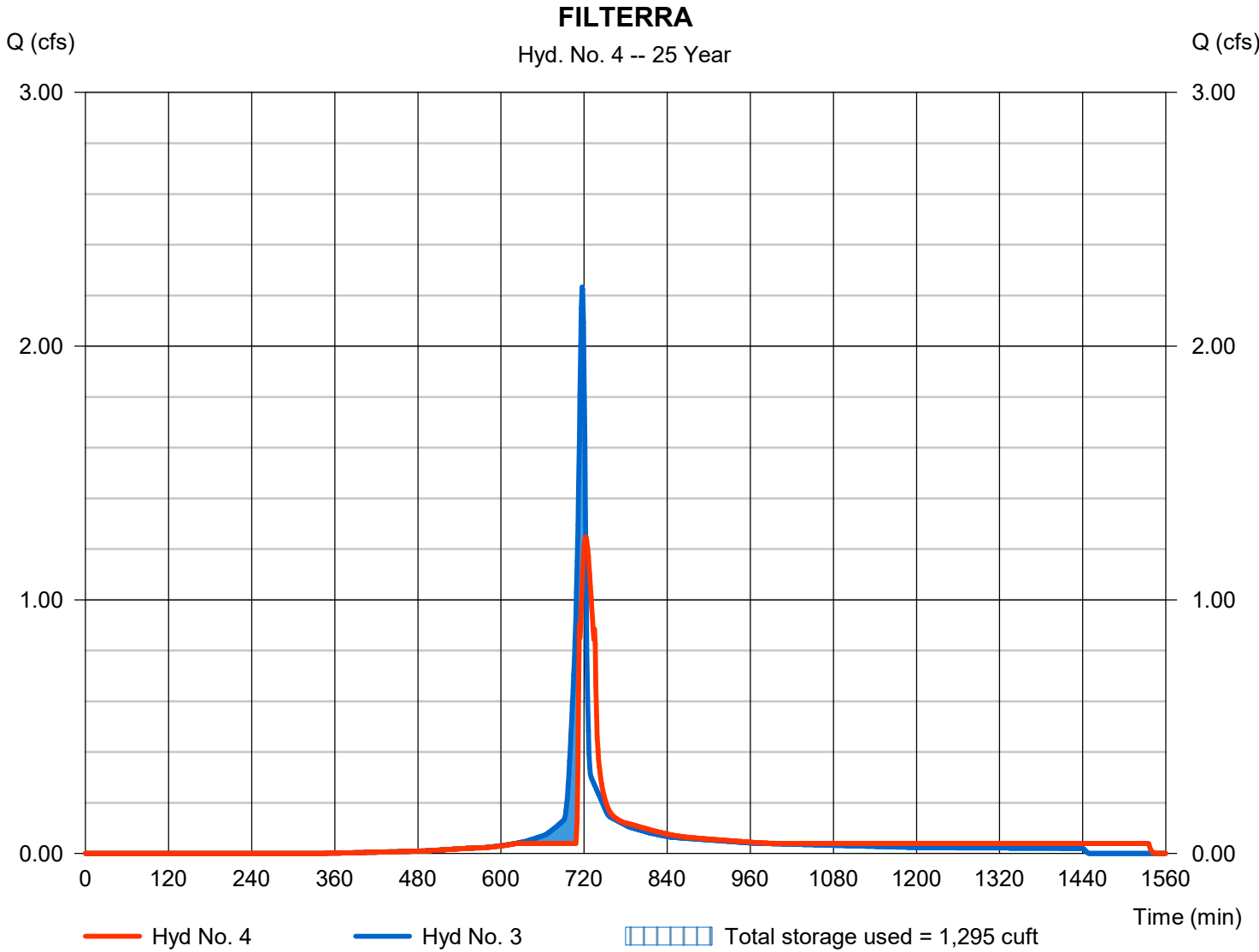
Tuesday, 12 / 7 / 2021

Hyd. No. 4

FILTERRA

Hydrograph type	= Reservoir	Peak discharge	= 1.247 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 1 min	Hyd. volume	= 4,670 cuft
Inflow hyd. No.	= 3 - Site	Max. Elevation	= 459.43 ft
Reservoir name	= FILTERRA	Max. Storage	= 1,295 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

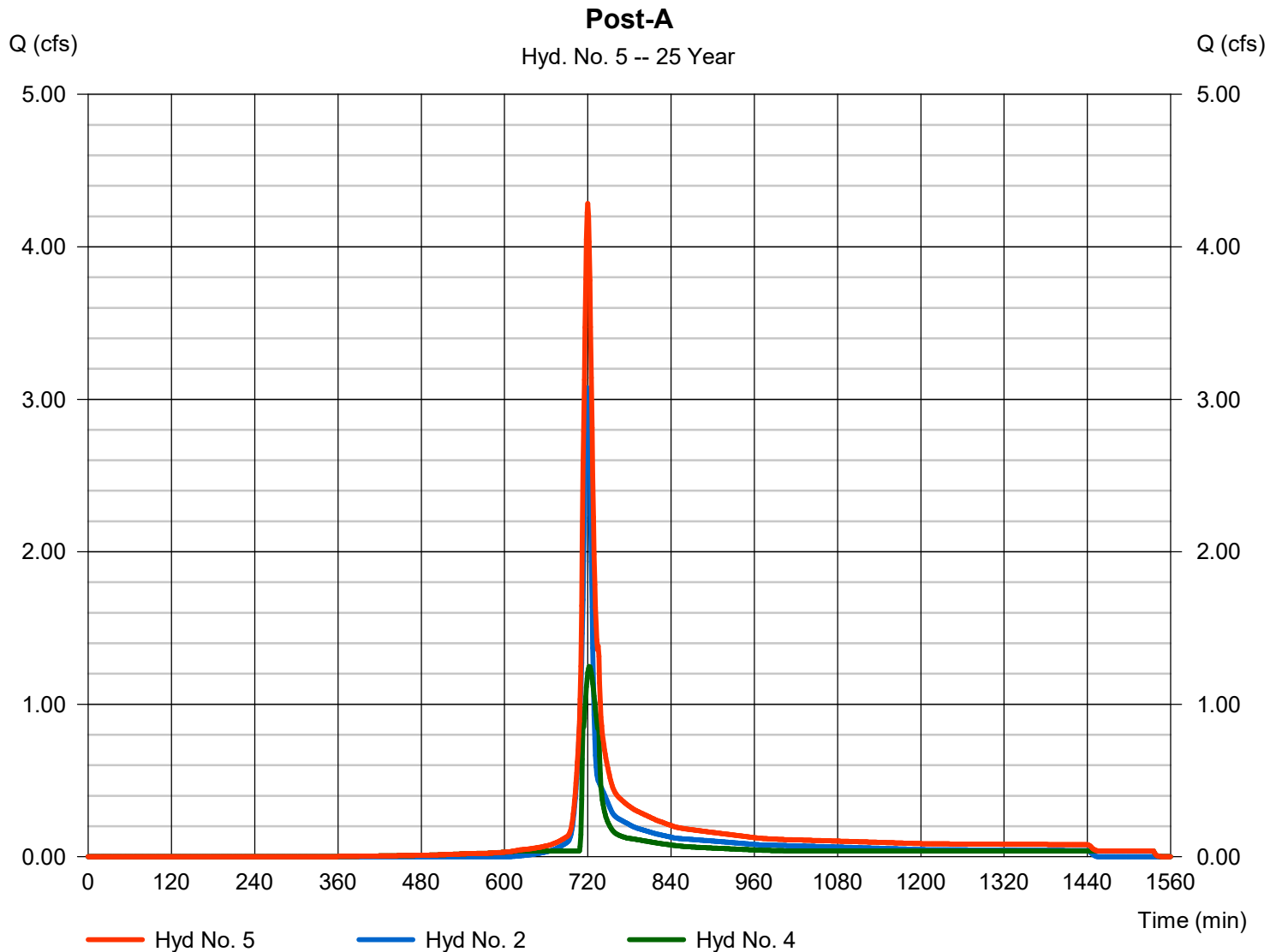
Tuesday, 12 / 7 / 2021

Hyd. No. 5

Post-A

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyds. = 2, 4

Peak discharge = 4.283 cfs
Time to peak = 720 min
Hyd. volume = 11,644 cuft
Contrib. drain. area = 0.770 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	6.663	1	719	15,071	-----	-----	-----	Pre-A	
2	SCS Runoff	4.574	1	719	10,349	-----	-----	-----	Post-A bypass	
3	SCS Runoff	2.957	1	717	6,285	-----	-----	-----	Site	
4	Reservoir	1.513	1	723	6,285	3	459.76	1,716	FILTERRA	
5	Combine	6.040	1	720	16,633	2, 4	-----	-----	Post-A	
26011_Hydrographs2021.11.30.gpw					Return Period: 100 Year			Tuesday, 12 / 7 / 2021		

Hydrograph Report

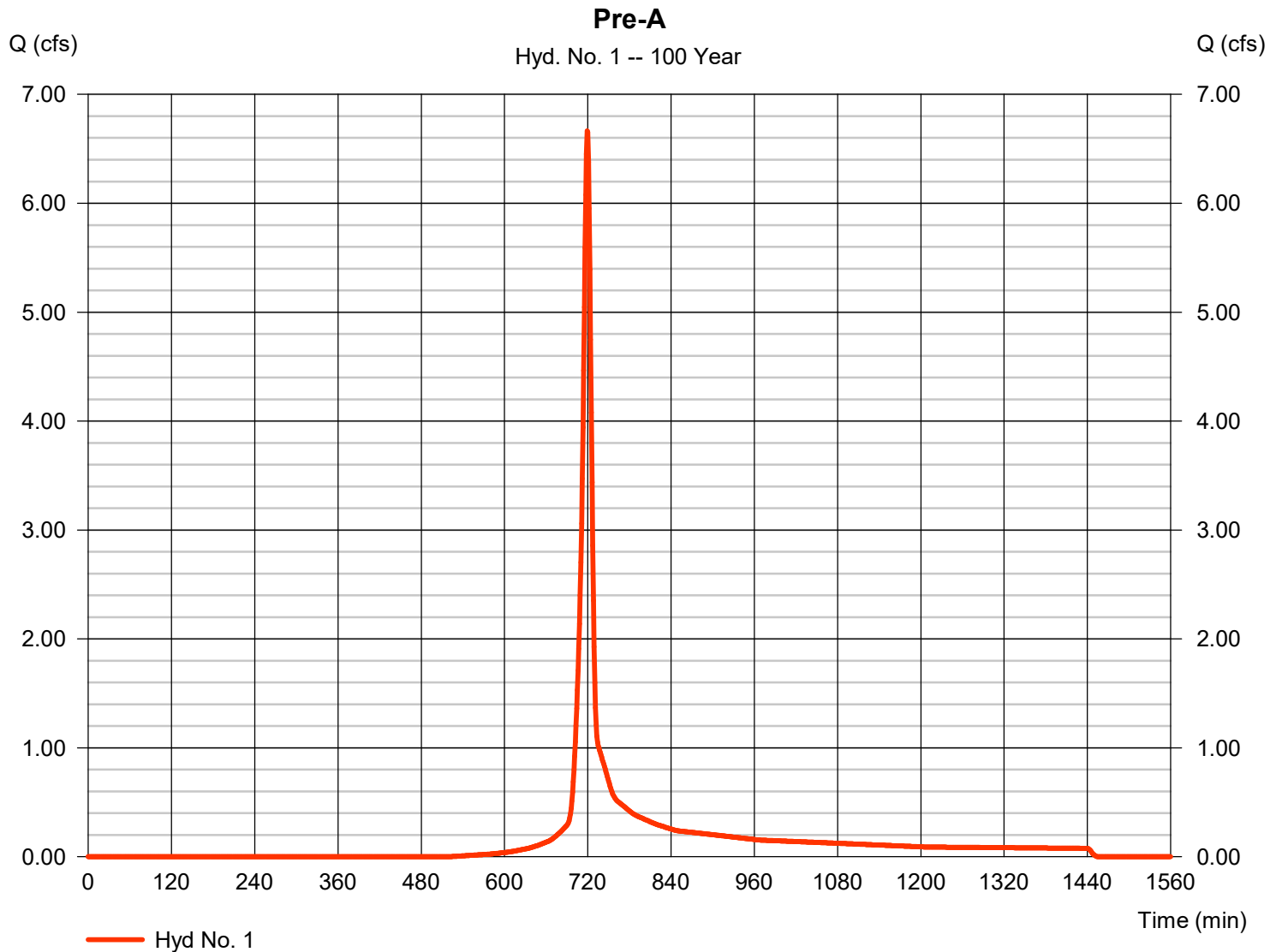
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 1

Pre-A

Hydrograph type	= SCS Runoff	Peak discharge	= 6.663 cfs
Storm frequency	= 100 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 15,071 cuft
Drainage area	= 1.060 ac	Curve number	= 65.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.60 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

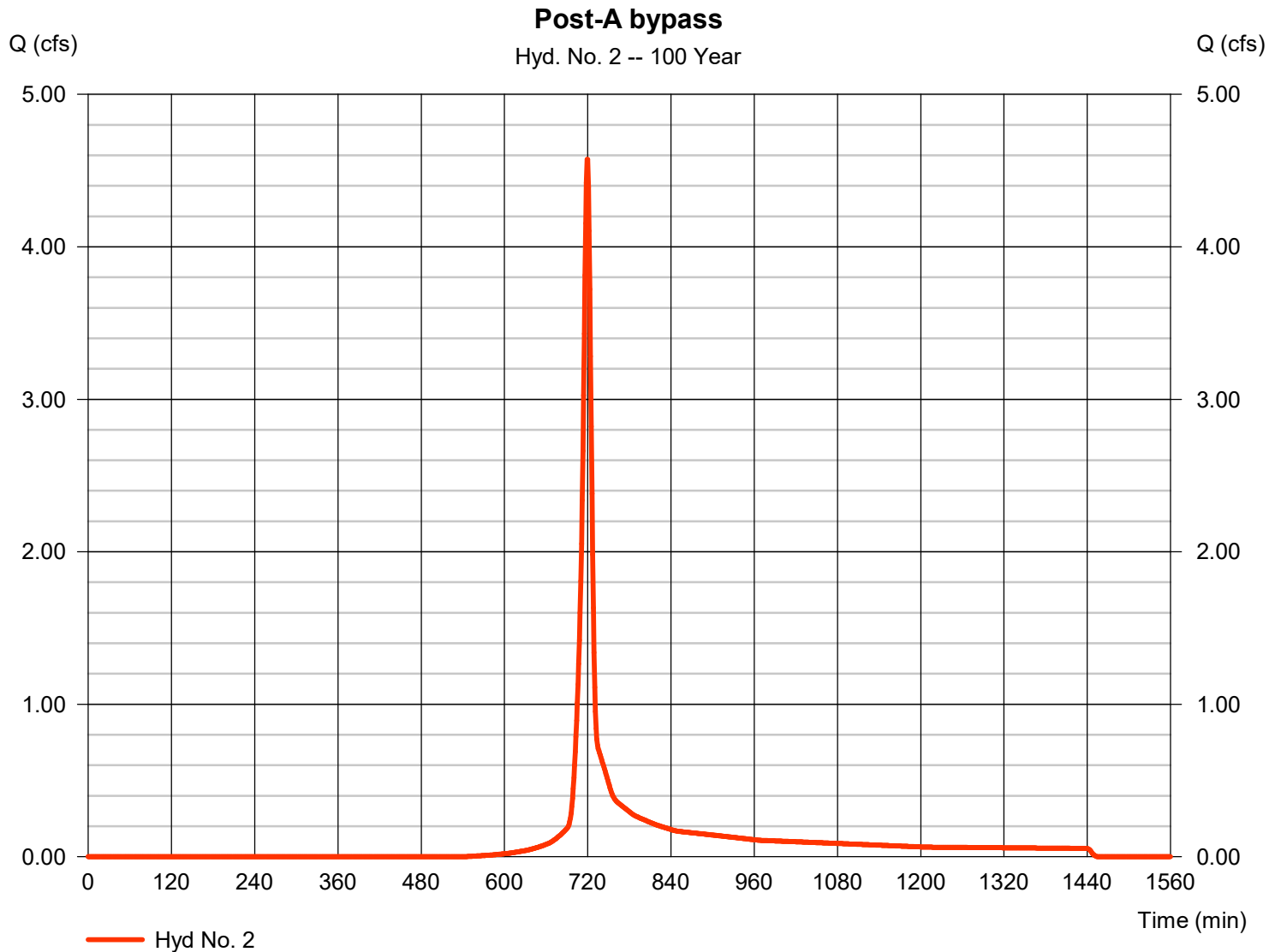
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 2

Post-A bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 4.574 cfs
Storm frequency	= 100 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 10,349 cuft
Drainage area	= 0.770 ac	Curve number	= 63.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.60 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

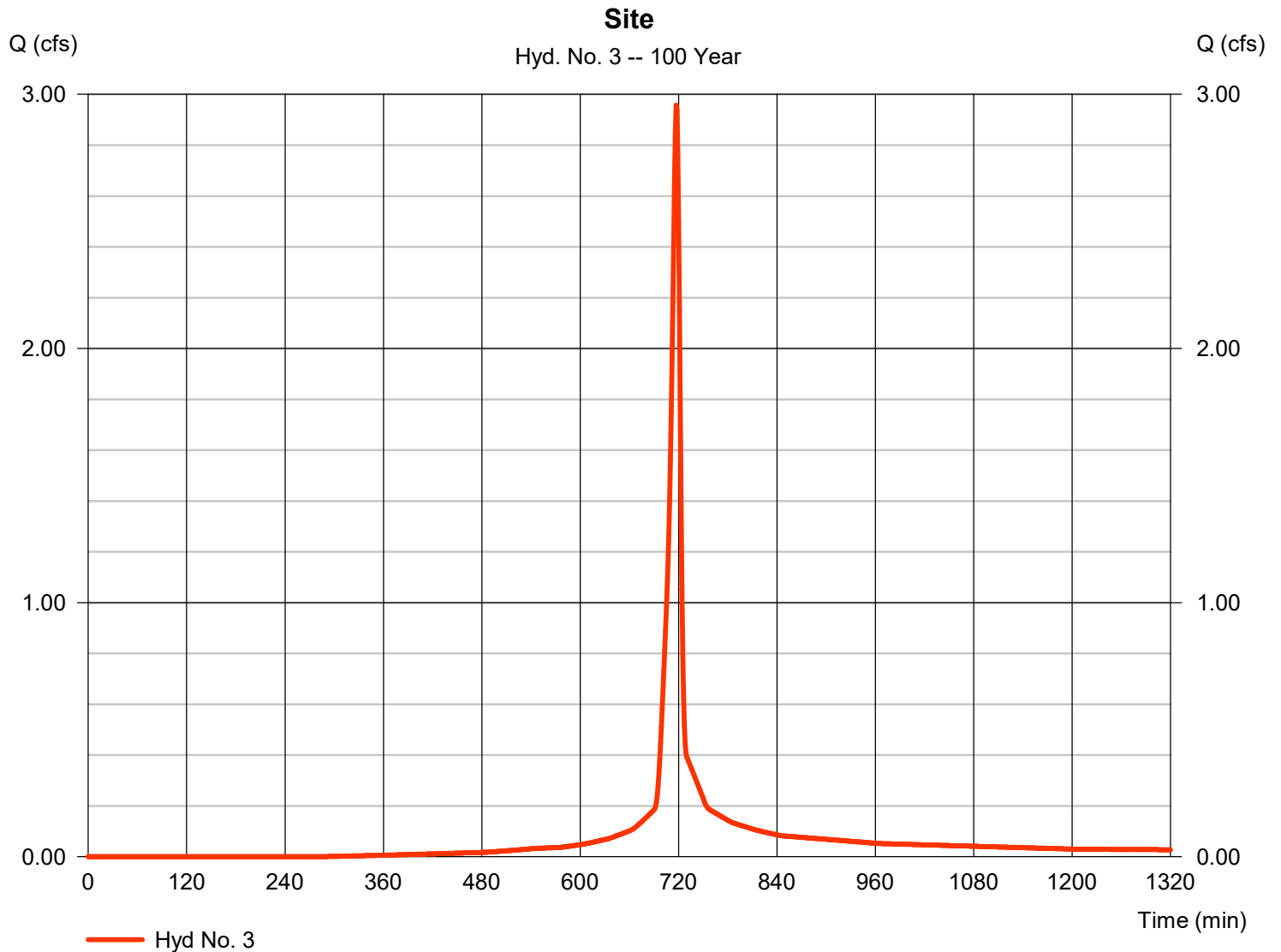
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 3

Site

Hydrograph type	= SCS Runoff	Peak discharge	= 2.957 cfs
Storm frequency	= 100 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 6,285 cuft
Drainage area	= 0.290 ac	Curve number	= 81.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

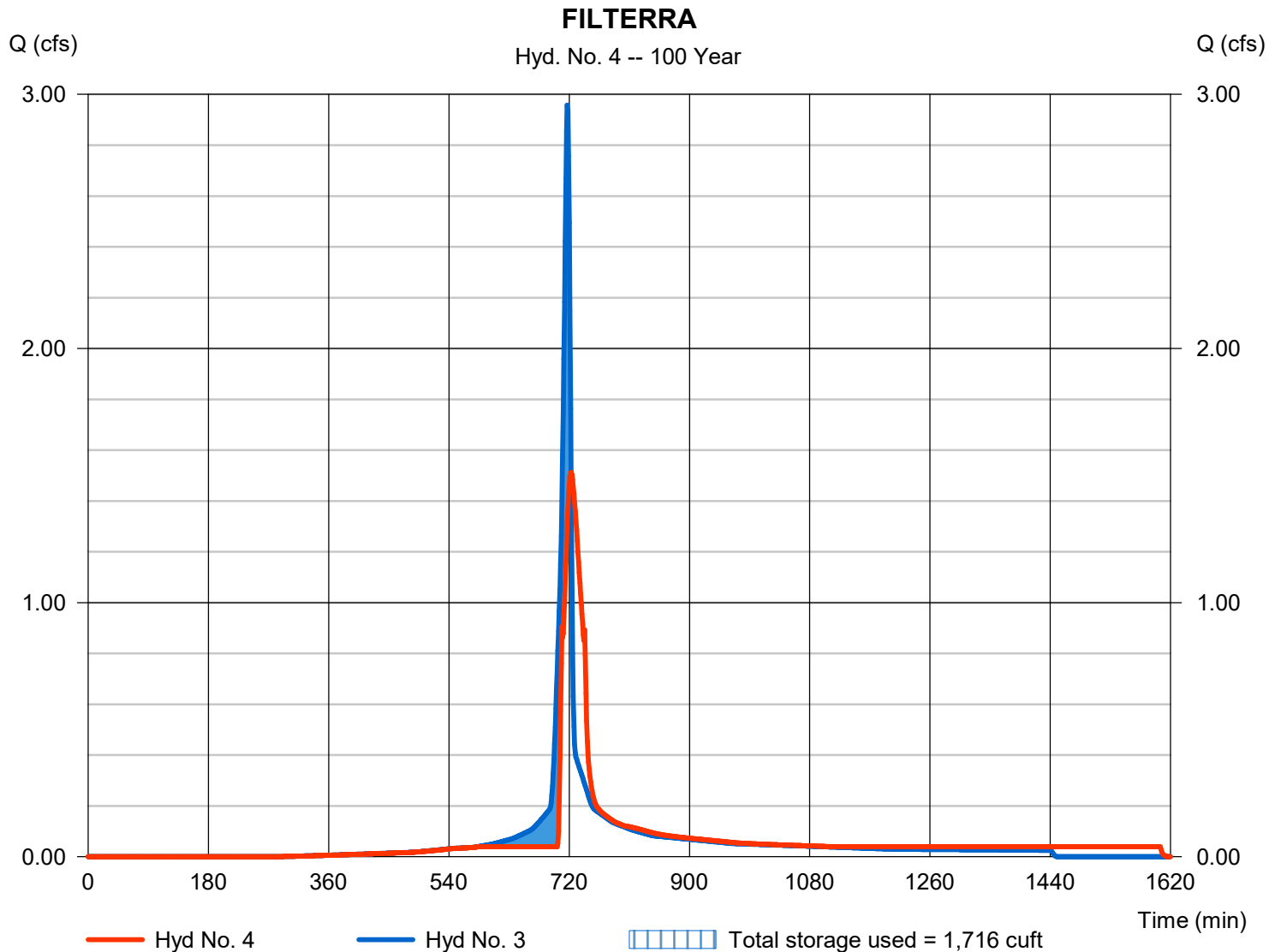
Tuesday, 12 / 7 / 2021

Hyd. No. 4

FILTERRA

Hydrograph type	= Reservoir	Peak discharge	= 1.513 cfs
Storm frequency	= 100 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 6,285 cuft
Inflow hyd. No.	= 3 - Site	Max. Elevation	= 459.76 ft
Reservoir name	= FILTERRA	Max. Storage	= 1,716 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 12 / 7 / 2021

Hyd. No. 5

Post-A

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 2, 4

Peak discharge = 6.040 cfs
Time to peak = 720 min
Hyd. volume = 16,633 cuft
Contrib. drain. area = 0.770 ac

