TOWN OF EXETER, NEW HAMPSHIRE

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www.exeternh.gov

LEGAL NOTICE
EXETER PLANNING BOARD
AGENDA

The Exeter Planning Board will meet on Thursday, September 8, 2022 at 7:00 P.M. in the Nowak Room of the Exeter Town Office building located at 10 Front Street, Exeter, New Hampshire to consider the following:

APPROVAL OF MINUTES: July 14 and August 25, 2022

NEW BUSINESS: PUBLIC HEARINGS

The continued public hearing on the application of Glerups, Inc. for a site plan review and Wetlands Conditional Use Permit for the proposed construction of a 95,000 +/- square foot industrial warehouse building and associated site improvements on the property located at 19 Continental Drive. The subject property is located in the CT-1, Corporate Technology Park-1 zoning district. Tax Map Parcel #47-7-2. PB Case #22-9.

The application of Phillips Exeter Academy for a site plan review for the proposed reconstruction of the Wetherell Dining Hall, renovations to the Merrill and Langdell Halls and associated site improvements at 20-24 Spring Street. The subject property is located in the R-2, Single Family Residential zoning district. Tax Map Parcel #72-208. PB Case #22-12.

OTHER BUSINESS

- Master Plan Discussion
- Field Modifications
- Bond and/or Letter of Credit Reductions and Releases

EXETER PLANNING BOARD
Langdon J. Plumer, Chairman

Posted 08/26/22: Exeter Town Office and Town of Exeter website

TOWN OF EXETER
PLANNING BOARD
NOVAK ROOM – TOWN OFFICE BUILDING
10 FRONT STREET
JULY 14, 2022
DRAFT MINUTES

I. PRELIMINARIES:

BOARD MEMBERS PRESENT BY ROLL CALL: Chair Langdon Plumer, Vice Chair Aaron Brown, Pete Cameron, Clerk, Jennifer Martel, Nancy Belanger Select Board Representative, Gwen English and Robin Tyner, Alternate.

STAFF PRESENT: Town Planner Dave Sharples

II. CALL TO ORDER: Chair Plumer called the meeting to order at 7:00 PM, introduced the members and activated alternate Robin Tyner.

III. OLD BUSINESS

APPROVAL OF MINUTES

May 26, 2022

Mr. Cameron and Ms. English recommend edits.

Mr. Cameron motioned to approve the May 26, 2022 meeting minutes as amended. Ms. Belanger seconded the motion. A vote was taken, Mr. Brown abstained, the motion passed 6-0-1.

June 9, 2022

Ms. Belanger motioned to approve the June 9, 2022 meeting minutes, as presented. Ms. English seconded the motion. A vote was taken, Ms. Martel and Mr. Cameron abstained. The motion passed 5-0-2.

IV. NEW BUSINESS

PUBLIC HEARINGS

1. The application of Wiley Creek Co. for site plan review, lot line adjustment and wetlands and shoreland conditional use permits for the proposed relocation of Building D of the Ray Farm

Condominium Development and associated site improvements off Ray Farmstead Road (Wiley Creek Road)
C-3 Epping Road Highway Commercial zoning district
Tax Map Parcel #47-8-1 and #47-9
Planning Board Case #22-3

Chair Plumer read out loud the Public Hearing Notice and letter from the applicant requesting a continuance to the Planning Board's next meeting.

Vice-Chair Brown motioned to continue Planning Board Case #22-2 to the Planning Board's August 25, 2022 meeting at 7:00 PM. Ms. Tyner seconded the motion. A vote was taken, all were in favor, the motion passed 7-0-0.

2. The application of Unitil for a Wetlands Conditional Use Permit to remove an above-ground meter station and decommission a section of buried natural gas pipe between Kingston Road and Heritage Way. Construction vehicle access to the work area will require temporary impact to wetlands within the natural gas pipeline corridor
R-1 Low Density Residential zoning district
Tax Map Parcels #74-81 and #81-56
Planning Board Case #22-11

Chair Plumer read out loud the Public Hearing Notice.

Mr. Sharples indicated the case was ready to be heard.

Mr. Cameron motioned to open Planning Board Case #22-11. Ms. Belanger seconded the motion. A vote was taken, all were in favor, the motion passed unanimously 7-0-0.

Mr. Sharples described the application for a wetlands conditional use permit to remove the above-ground meter station and decommission the section of natural gas pipeline noting temporary impact. He noted the applicant provided plans and supporting documentation on 7/5/22 and went before the Conservation Commission who provided a letter of recommendation from Mr. Koff. Mr. Sharples noted there was a site walk on July 7 and a vernal pool, along the access road, was noted to have tadpoles present. Certified Wetlands Scientist Chuck Wyman indicated they were not tadpoles of the wood frog species and recommended approval as presented. There was no TRC review but the application and materials were provided to staff for review. There are no waivers or suggested conditions of approval.

Michael Dunn and Brian Chaput appeared for Unitil and offered to answer any questions.

Ms. English asked why this needed to be removed and they indicated another station on Epping Road would serve the area. The below ground piping would be abandoned, and the above-ground piping and meter station removed. The work would be coordinated with the timing of the sidewalk projected. Work would be done in September or October and not interfere with the tadpoles which should be

mature by then. The use and removal of timber mats were described as well as restoration of temporary disturbances. Work was expected to take four to five weeks including restoration.

Ms. English asked the location of the vernal pool and it was indicated along the green line shown on the plan.

Ms. Martel asked about equipment and storage and it was indicated there would be excavators, trucks and pick up trucks at the job site with trailer for tools. She recommended being in touch with Parks & Recreation to let them know.

Vice-Chair Brown referenced the CUP criteria in 9.1.6.b of the regulations, the restoration proposal for criteria #7 and the applicant's response. Vice-Chair Brown indicated Wood Environmental Eng. Comments about other permits to obtain from NH DES.

Ms. Belanger motioned after reviewing the criteria for approval of the wetlands conditional use permit that the application of Unitil be approved with the condition that they contact and communicate with Parks & Recreation concerning parking. Ms. Martel seconded the motion. A roll call vote was taken Belanger – aye, English – aye, Brown – aye, Plumer – aye, Cameron – aye, Martel – aye, and Tyner – aye. The motion passed 7-0-0.

V. OTHER BUSINESS

- Master Plan Discussion

- Field Modifications

- Bond and/or Letter of Credit Reductions and Release

  Mr. Sharples reported that McFarland Ford competed the parking lot per plan and the site restoration bond was released.

- Ms. Martel asked about the procedure for the Planning Board to address unmaintained landscaping for a project. Mr. Sharples explained the condition to establish the landscaping and replacing dead or dying after two years and the consequences for not establishing. If a condition of approval or of the site plan, these could be revoked. If several years have gone by then it would need to be brought to the Town Planner's attention who will contact the owner. Vice-Chair Brown noted sometimes the Town is responsible such as when it is a public road acceptance and how much easier it is to deal with a HOA when this happens. He noted it has been a hard year with lack of rain and many are having difficulty keeping their lawns and landscaping from turning brown.

VIII. TOWN PLANNER'S ITEMS

Mr. Sharples reported the first meeting in August on August 11 will be the CIP with Department Heads and the second public meeting on that will be at 6:30 PM on August 25th.

IX. CHAIRPERSON'S ITEMS

X. PB REPRESENTATIVE'S REPORT ON "OTHER COMMITTEE ACTIVITY"

XI. ADJOURN.

Vice-Chair Brown motioned to adjourn the meeting at 7:43 PM. Ms. Belanger seconded the motion. A vote was taken all were in favor, the motion passed 7-0-0.

Respectfully submitted,

Daniel Hoijer,
Recording Secretary
Via Exeter TV

TOWN OF EXETER
PLANNING BOARD
NOWAK ROOM – TOWN OFFICE BUILDING
10 FRONT STREET
AUGUST 25, 2022
6:30 PM
DRAFT MINUTES

I. PRELIMINARIES:

BOARD MEMBERS PRESENT BY ROLL CALL: Chair Langdon Plumer, Vice-Chair Aaron Brown, Pete Cameron, Clerk, Nancy Belanger Select Board Representative, John Grueter, Gwen English (@ 7:04 PM), Robin Tyner, Alternate (@7:04 PM) and Dan Chartrand, Alternate.

STAFF PRESENT: Town Planner Dave Sharples

II. CALL TO ORDER: Chair Plumer called the meeting to order at 6:30 PM, introduced the members and activated alternate Dan Chartrand.

III. OLD BUSINESS

APPROVAL OF MINUTES

July 14, 2022

Ms. Belanger motioned to table approval of the July 14, 2022 meeting minutes. Mr. Cameron seconded the motion. A vote was taken, all were in favor, the motion passed 6-0-0.

August 11, 2022

Mr. Grueter motioned to approve the August 11, 2022 meeting minutes. Mr. Chartrand seconded the motion. A vote was taken, Mr. Cameron and Vice-Chair Brown abstained. The motion passed 4-0-2.

IV. NEW BUSINESS

PUBLIC HEARINGS

1. Second Public Hearing on the 2023 Capital Improvements Program (CIP) projects as presented by the Town Departments. (Copies of the proposed document(s) will be available at the Planning Department Office).

Mr. Sharples noted that the Town Department Heads presented their CIP projects at the last meeting and were available to answer questions. The second public meeting allows for the Public to ask

questions and for the Board to vote to adopt the CIP and send a transmittal letter with their recommendations, one of which was to move the Downtown Parking Flow Analysis from 2024 to 2023.

Chair Plumer opened the hearing to the public for comments and questions at 6:45 PM.

Chair Plumer commented that the Police and Fire Facility is outdated.

Mr. Chartrand noted that in the transmittal letter the Board might ask to identify projects that may be eligible for infrastructure monies and to accelerate their pace given how much money is out there now, especially projects to improve upon drinking water and sewer.

Ms. Belanger noted the Assistant Town Manager is right on it as far as funds coming in.

Mr. Chartrand motioned to accept the CIP and push forward with the Board's comments.

The Town should determine availability of federal funding in determining CIP and actively pursue funding and be open to the possibility of moving a project forward in a timely manner should funding be secured. The Planning Board supports funding the Parking Study in 2023.

Mr. Grueter seconded the motion. A vote was taken, all were in favor, the motion passed 6-0-0.

Chair Plumer indicated Vice-Chair Brown would stop in and sign the letter.

2. The application of Willey Creek Co. for site plan review, lot line adjustment and Wetlands and Shoreland Conditional Use Permits for the proposed relocation of Building D of the Ray Farm Condominium development and associated site improvements off of Ray Farmstead Road (Willey Creek Road)
   C-3 Epping Road Highway Commercial zoning district
   Tax Map Parcel #47-8-1 and #47-9
   Planning Board Case #22-3

Chair Plumer read the Public Hearing Notice out loud and indicated an email had been received from their attorney.

Mr. Sharples read the email out loud and indicated the applicant could not attend the Board's next meeting and the Board has not accepted jurisdiction. The applicant noted they will refile and therefore the Board doesn't need to take any action. Attorney Justin Pasay who was present noted the applicant would like to table their application and will be responsible for costs of renoticing.

3. The application of Glerups, Inc. for a site plan review and Wetlands Conditional Use Permit for the proposed construction of a 95,000 +/- square foot industrial warehouse building and associated site improvements on the property located at 19 Continental Drive
   CT-1 Corporate Technology Park-1 zoning district
   Tax Map Parcel #47-7-2
   Planning Board Case #22-9

   Chair Plumer read out loud the public hearing notice and asked Mr. Sharples if the case was ready to be heard. Mr. Sharples indicated the case was ready for review purposes.

Mr. Chartrand motioned to open Planning Board Case #22-9. Ms. Belanger seconded the motion. A vote was taken, all were in favor, the motion passed unanimously.

Mr. Sharples indicated the site plan review and Wetlands CUP documents dated May 31, 2022 were in the packet. There was a TRC meeting on June 24th with comments on June 29th and comments from UEI dated June 27. The applicants went before the Conservation Commission on July 12, 2022 and a memo from Andrew Koff is provided recommending approval with two conditions: to eliminate unnecessary parking spaces and minimize the driveway. The applicant's response dated July 28, 2022 is also provided. There were no final comments from UEI and no waivers are requested. If the Board decides to schedule a site walk, then the applicant's will be asked to mark important features.

Alternate Robin Tyner arrived at 7:04 PM and was activated until Ms. English arrived shortly thereafter.

Eric Saari with Altus Engineering presented the application on behalf of Glerups Warehouse. He indicated Wetland's Scientist Brendan Quigley with Gove Environmental was present and Paul Roy of Pro Con, the project architect.

Mr. Saari handed out samples of the product he noted were slippers made by a Denmark Company. They are looking to replace their current distribution warehouse location in Newfields as they need more space.

Mr. Saari posted the plan for viewing and pointed out the access easement area and wetlands which he noted include a vernal pool. Mr. Saari pointed out the neighboring cell tower. He indicated the site would be for a 95,000 SF warehouse with loading docks in front and offices behind There would be 75 parking spaces. He described the bioretention rain garden and infiltration areas and noted there would be curbing to catch basins and treatment of stormwater. He noted erosion control measures and described the retaining walls to minimize wetland impacts.

Brendan Quigley from Gove Environmental pointed out the wetlands that surround the site and the finger wetlands of impact which extend to the Little River Conservation Area but are not part of that complex. He pointed out the vernal pool close to the shared access driveway and small 75' buffer impact of that pool. He indicated he would discuss it more in depth before the Board took action on the CUP criteria but stated that it meets avoidance and minimization, and the design maximizes avoiding impact with the retaining walls and steep grading. Temporary impacts from the retaining walls will be restored. He noted his functions and values repot identified three functions, water quality and there were no stream channels or through paths but a more circuitous route; wildlife habitat with the vernal pool; and food source for wildlife. He noted the property was logged somewhat a few years ago and there was evidence of new growth, berries and shrubs. Vice-Chair Brown noted he did not see the functions and values attachment. Mr. Sharples noted the Town has it and will distribute it before the next meeting.

Mr. Saari noted the plan has been modified to bring in the edge of pavement and signage added for there to be no snow dumping near the vernal pool and additional parking was removed. There is a note on the utility portion of the plan concerning water testing. There have been lighting changes to minimize wetland impact, all LED/Dark Sky compliant.

Vicki Martel presented the landscaping plan showing 15 disease resistant elms around the perimeter and columnar Maples in front with ornamental grasses.

Paul Roy of Pro Con noted the building will be similar to Unitil and Gourmet Gift Baskets with some wood and possibly solar on the roof.

Ms. Tyner asked about phasing and Mr. Roy noted the 95,000 SF facility would be built as shown on the plans but may be phased in terms of occupancy, not construction.

Chair Plumer opened the hearing to the public at 7:31 for comments and questions.

Vice-Chair Brown asked about the Conservation Commission conditions. Mr. Saari noted 17 parking spaces were eliminated and the roadway was pulled in as much as possible keeping with concerns of the Fire Department for life safety.

Chair Plumer asked about the gravel area and Mr. Sharples noted there was no discussion of changing pavement to gravel, and parking spaces must be paved. Mr. Saari indicated all deliveries are in back. Mr. Saari indicated those would be changed and the sidewalk extended.

Vice-Chair Brown asked which spaces were removed and Mr. Saari showed 12 in one area and five in the back. Ms. Tyner asked if 75 spaces were full capacity and Mr. Saari indicated yes.

Ms. English asked about plowing near the vernal pool whether there could be more protection such as fencing or plantings. Mr. Saari noted five signs at 50’ intervals and that the vernal pool side will have curbing and described sediment controls.

Ms. English asked about the clearing and Mr. Saari explained the history of the property which was formerly a tennis club. There was about one day of clearing done ten years ago before that project stopped abruptly.

The Board discussed the possibility of a scheduled site walk and with lack of availability due to vacations decided to visit the site on their own. Vice-Chair Brown recommended the On X Hunt app.

Mr. Cameron noted cumulative impact concerns concerning traffic and the intersection. Mr. Sharples noted the State redid the intersection and it is signalized. Chair Plumer referenced the traffic study provided by Stephen Pernaw.

Ms. English noted cumulative impact concerns concerning the wetlands and long-term effect on water and that she would feel better if the building were a bit smaller. Ms. Tyner agreed and noted

concerns with loss of wildlife in general based on her own experience. Mr. Quigley noted stormwater management has become much better over the years and that a lot of wetlands were conserved.

Chair Plumer asked about the functions of the cell tower piece and Mr. Quigley noted there was no possibility of access there, it was pretty wet. The access easement is existing.

Vice-Chair Brown motioned to table the application for Planning Board Case #22-9 to the Board's September 8, 2022 meeting at 7:00 PM. Mr. Chartrand seconded the motion. A vote was taken, all were in favor, the motion passed 7-0-0.

4. The application of Brentwood Distribution LLC for a site plan review of a proposed expansion of the existing lay-down area for the mulch and forest products processing facility located at 91 Pine Road (in Brentwood)
RU-Rural zoning district
Tax Map Parcel #30-3 and #43-2
Planning Board Case #22-10

Chair Plumer read out loud the public hearing notice and asked Mr. Sharples if the case were ready to be heard. Mr. Sharples indicated the case was ready for review purposes.

Mr. Chartrand motioned to open Planning Board Case #22-10. Ms. Belanger seconded the motion. A vote was taken, all were in favor, the motion passed 7-0-0.

Mr. Sharples noted the applicant is seeking approval for the 161,500 SF (3.5 AC in Exeter) expansion of the existing laydown area for the PR Russell Mulch and Forest Products processing facility located on Pine Road in Exeter & Brentwood. The applicant submitted site plan and supporting documents dated June 24, 2022. A TRC meeting was conducted on July 14, 2022. TRC & UEI comment letters both dated July 19, 2022 were provided and a response letter to the TRC comments dated July 26, 2022 addressing Town & UEI comments and revised plans dated August 11, 2022.

Mr. Sharples indicated the applicant is requesting a waiver from Section 7.4.7 of the Site Plan Review and Subdivision Regulations for the location of significant trees. See July 26, 2022 request letter.

Eric Weinrup with Altus Engineering presented the application on behalf of Brentwood Distribution LLC. He noted the applicant received conditional approval from Brentwood at their July meeting. He noted the laydown area would be paved and used for storage of shrink rapped materials on pallets seasonally. There will be no processing, sanding, salting or snow removal. There are about 25 employees not including trucking. There will be no hazardous waste or processing on site. The prime wetland and buffer will not be touched. They received their State AoT permit today. Stormwater management was shown on the plan. There are about 20 trees being removed.

Mr. Grueter asked if paving was necessary and he noted there would be erosion otherwise and forklifts are being used.

Chair Plumer opened the hearing to the public at 8:30 PM and being none closed the hearing to the public for deliberations.

Ms. English asked about chemicals and Mr. Russell noted there was only a small amount of dye, tumbled in.

Vice-Chair Brown motioned after reviewing the criteria for granting waivers that the Board grant a waiver to Brentwood Distribution LLC, Planning Board Case #22-10 from Section 7.4.7 of the Site Plan Review and Subdivision Regulations requiring identification of significant trees 20" or greater, be approved. Ms. Belanger seconded the motion. A roll call vote was taken, English – aye, Belanger – aye, Grueter – aye, Brown – aye, Plumer – aye, Cameron – aye and Chartrand – aye. The motion passed 7-0-0.

Mr. Sharples read out loud the proposed conditions of approval:

1. An electronic As Built Plan of the entire property with details acceptable to the Town shall be provided prior to the use of the site. This plan must be in a dwg or dxf file format and in NAD 1983 State Plane New Hampshire Coordinates;
2. A preconstruction meeting shall be arranged by the applicant and his contractor with the Town engineer prior to any site work commencing. The following must be submitted for review and approval prior to the preconstruction meeting:
    i. The SWPPP (Stormwater Pollution Prevention Plan) if applicable, be submitted to and reviewed for approval by the DPW prior to preconstruction meeting;
    ii. A project schedule and construction cost estimate.
3. Third party construction inspections fees shall be paid prior to scheduling the preconstruction meeting.
4. The annual Stormwater Systems Operations and Maintenance Report in the Stormwater Management Operations and Maintenance Manual shall be completed and submitted to the Town Engineer annually on or before January 31st. This requirement shall be an ongoing condition of approval.
5. All applicable State Permit approval numbers shall be noted on the final plans
6. All landscaping shown on plans shall be maintained and any dead or dying vegetation shall be replaced no later than the following growing season, as long as the site plan remains valid. This condition is not intended to circumvent the revocation procedures set forth in State statutes.
7. The applicant shall submit the land use and stormwater management information about the project using the PTAPP online Municipal Tracking Tool. The PTAPP submittal must be accepted by DPW prior to the preconstruction meeting.
8. A restoration and erosion control surety in an amount and form reviewed and approved by the Town Planner in accordance with Section 12 of the Site Plan Review and Subdivision Regulations, shall be provided prior to any site work.

9. All comments in the Underwood Engineers, Inc. review letter dated 7-19-22 and any subsequent comments as a result of the further review shall be addressed to the satisfaction of the Town Planner prior to signing the final plans.

Ms. English asked if there were any utilities/lighting – no.

Vice-Chair Brown motioned that the application of Brentwood Distribution LLC, Planning Board Case #22-10 for site plan approval be approved with the conditions read by Dave Sharples. Ms. Belanger seconded the motion. A roll call vote was taken Chartrand - aye, Cameron – aye, Plumer – aye, Brown – aye, Grueter – aye, Belanger – aye and English – aye. The motion passed 7-0-0.

5. The application of 131 Portsmouth Avenue LLC for a minor subdivision of an existing 15.26-acre parcel into two (2) lots. The subject property is located at 131 Portsmouth Avenue & Holland Way
2 Highway Commercial and CT – Corporate Technology Park zoning districts
Tax Map Parcel #52-112
Planning Board Case #22-13

Chair Plumer read out loud the public hearing notice and asked Mr. Sharples if the case was ready to be heard. Mr. Sharples indicated the case was ready for review purposes.

Vice-Chair Brown motioned to open Planning Board Case #22-13. Mr. Cameron seconded the motion. A vote was taken, all were in favor, the motion passed unanimously.

Mr. Sharples indicated the application was for a minor subdivision into two lots and was reviewed by Code Enforcement Officer Doug Eastman. There was no TRC meeting. The drainage ditch is manmade. There are no waivers requested.

Patrick Crimmins with Tighe & Bond, Inc. presented the application. He noted the parcel was part of the larger Osram parcel. There will be a 9.03 Acre parcel with existing light industrial building while retaining the 2.24-acre piece.

Mr. Sharples read out loud the two proposed conditions of approval:

1. A dwg file of the plan shall be provided to the Town Planner showing all property lines and monumentation prior to signing the final plans. This plan must be in NAD 1983 State Plane New Hampshire FIPS 2800 Feet coordinates.
2. All monumentation shall be set in accordance with Section 9.25 of the Site Plan Review and Subdivision Regulations prior to the signing of the final plans.

Mr. Grueter motioned the application of 131 Portsmouth Avenue LLC, Planning Board Case #22-13 for a minor subdivision be approved with the conditions read by the Town Planner. Ms. Belanger seconded the motion. A vote was taken, all were in favor, the motion passed unanimously.

Mr. Chartrand called for reconsideration to open the hearing to the public.

Chair Plumer opened the hearing to the public for comments and questions at 8:47 PM and being none closed the hearing to the public for deliberations.

Mr. Grueter motioned the application of 131 Portsmouth Avenue LLC, Planning Board Case #22-13 for a minor subdivision be approved with the conditions read by the Town Planner. Ms. Belanger seconded the motion. A vote was taken, all were in favor, the motion passed unanimously.

V. OTHER BUSINESS

- Scott Carlisle – PB Case #20-21
  Request for extension of approval for subdivision at 19 Watson Road

Barry Geier with Jones & Beach appeared to request an extension of the approval dated 9/23/21 for one year. He noted they were still finalizing state permits and have a P&S.

Vice-Chair Brown noted there were no changes to regulations that effect approval.

Vice-Chair Brown motioned to grant the request to continue approval for Planning Board Case #20-21 for one year. Mr. Grueter seconded the motion. A vote was taken, all were in favor, the motion passed unanimously 7-0-0.

- Scott Carlisle – PB Case #17-26
  Request for extension of approval for subdivision off of Epping Road

Chair Plumer read out loud the request for an extension of the approval. Mr. Sharples noted correspondence was received from DTC Lawyers dated 8-24-22 and Upton & Hatfield dated 8-25-22. Abutters objected to the extension. If denied, the applicant would like to continue and be heard.

By Roll Call Vote Vice-Chair Brown motioned to go into non-public session pursuant to 91-A:3(II)(l) consideration of advice of legal counsel. Ms. Belanger seconded the motion. A roll call vote was taken: English – aye, Belanger – aye, Grueter – aye, Brown – aye, Plumer – aye, Cameron – aye and Chartrand – aye. The motion passed unanimously 7-0-0.

The meeting room was closed to the public at 8:54 PM.

The meeting room was reopened to the public at 9:01 PM.

Vice-Chair Brown motioned to grant the extension for Planning Board Case #17-26 until August 24, 2023. Ms. Belanger seconded the motion. A roll call vote was taken: English – aye, Belanger – aye, Grueter – aye, Brown – aye, Plumer – aye, Cameron – aye and Chartrand – aye. The motion passed 7-0-0.

- One Home Builders – PB Case #21-6
  Request for extension of conditional approval for a M/F condominium development at 32 Charter Street

Chair Plumer read the request for an extension out loud.

Vice-Chair Brown motioned to grant the extension for Planning Board Case #21-6 until September 24, 2023. Ms. Belanger seconded the motion. A vote was taken, all were in favor, the motion passed unanimously.

- Master Plan Discussion

Mr. Sharples indicated there would be meeting at 8:15 AM here on September 16th which should last approximately one hour.

- Field Modifications

- Bond and/or Letter of Credit Reductions and Release

Mr. Sharples indicated he received a request for a reduction from Primrose Day School however only 10% of the hydroseed was established so $21,000 is being withheld of the original $63,000.

VIII. TOWN PLANNER'S ITEMS

IX. CHAIRPERSON'S ITEMS

X. PB REPRESENTATIVE'S REPORT ON "OTHER COMMITTEE ACTIVITY"

XI. ADJOURN.

Vice-Chair Brown motioned to adjourn the meeting at 9:07 PM. Ms. Belanger seconded the motion. A vote was taken all were in favor, the motion passed 7-0-0.

Respectfully submitted,

Daniel Hoijer,
Recording Secretary
Via Exeter TV

TOWN OF EXETER

Planning and Building Department

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709

www.exeternh.gov

Date: **August 31, 2022**

To: **Planning Board**

From: **Dave Sharples, Town Planner**

Re: **Glerups, Inc.** **PB Case #22-9**

The Applicant is seeking site plan approval and a Wetlands Conditional Use permit for the proposed construction of a 95,000 +/- square foot industrial warehouse building and associated site improvements on the property located at 19 Continental Drive. The subject property is located in the CT-1, Corporate Technology Park-1 zoning district and identified as Tax Map Parcel #47-7-2.

The Applicant has submitted a site plan, a Wetlands Conditional Use permit application and supporting documents, dated May 31, 2022 for review. Revised plans and supporting documents were received on July 28, 2022 and were provided in the last board mailing, along with responses to the TRC and UEI comment letters.

The Applicant presented their Wetland Conditional Use Permit application to the Conservation Commission at their July 12th, 2022 meeting and received a conditional approval. Memo from Conservation Chairman Andrew Koff, dated July 14, 2022 was previously provided.

It was noted at the August 25th, 2022 meeting that the meeting materials provided did not include a Wetlands Function & Values assessment for the site. This assessment was part of the NH DES Wetland Permit application and is enclosed for your review. Please note that the NH DES State Wetlands Permit application can be found in the electronic packet posted on the website.

The Board tabled further discussion on the application to the September 8th, 2022 meeting. It was noted that Board members could visit the site individually prior to the September 8th, 2022 meeting as a group site walk could not be organized.

The Applicant has provided revised plans, dated August 30th, 2022, in response to comments received at the August 25th, 2022 Planning Board meeting and

correspondence from Underwood Engineers, dated August 17, 2022. The revised plans and comments are enclosed for your review.

There are no waivers being requested by the Applicant for the project.

I will be prepared with suggested conditions of approval at the meeting in the event the board decides to act on the applications.

Planning Board Motion:

Site Plan Motion: I move that the request of Glerups, Inc. (PB Case #22-9) for Site Plan approval be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Conditional Use Permit (Wetlands) Motion: After reviewing the criteria for a Wetlands Conditional Use permit, I move that the request of Glerups, Inc. (PB Case #22-9) for a Conditional Use Permit be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Thank You.

Enclosures

civil &
environmental
engineering

UNDERWOOD
engineers

2814.00

August 17, 2022

David Sharples, Town Planner
Town Planning Office, Town of Exeter
10 Front Street
Exeter, NH 03833

Re: ***Glerups Warehouse – 19 Continental Drive***
Design Review Engineering Services
Exeter, New Hampshire

Site Information:

Review No. 2

Tax Map/Lot#: 46 / 7	
Address:	19 Continental Drive
Lot Area:	20.31 ac (+/- 7 ac developed for this project)
Proposed Use:	Industrial
Water:	Town
Sewer:	Town
Zoning District:	CT-1
Applicant:	Glerups, Inc.
Design Engineer:	Altus Engineering

Application Materials Received:

- Site plan set entitled "Glerups revised July 26, 2022, prepared by Altus Engineering.
- Response letters prepared by Altus Engineering.
- Drainage analysis and stormwater maintenance manual revised July 26, 2022, by Altus Engineering.

Dear Mr. Sharples:

We have received a response letter and revised documents from Altus Engineering per our comment letter dated June 27, 2022. We offer the following comments in accordance with the Town of Exeter Regulations and standard engineering practice.

General

1. UE understands that the SMH, previously noted as being full of water is a pass-through manhole containing the four local force mains servicing the development. No further comment.

ph 603.230.9898
fx 603.230.9899
99 North State Street
Concord, NH 03301
underwoodengineers.com

Site Plan

2. No exceptions taken

Grading and Drainage Plan

3. No exceptions taken.
4. No exceptions taken.
5. No exceptions taken.
6. No exceptions taken.

Utilities Plan

7. No further comment.
8. UE acknowledges that calculation that the 2" force main should pass flow at 2.38 ft/sec. In general, UE prefers to see flows of 3 ft/sec but acknowledges that 2 ft/sec is the minimum. We do recommend however that the Consultant follow up with E-One to review if upsizing the initial leg of the line to 1.5" or even 2" might improve the overall hydraulic performance of the line in its entirety. UE does not require a response to this inquiry.
9. UE's original comment, "We recommend adding a new valve near the property line/tie-in location to test against and for isolation" appears to have been misinterpreted. The comment was intended toward the existing 8" water supply main. It is unclear where the nearest in-line valve is in the line. The testing of the extension will require an understanding of the total length of pipe being tested.
10. No further comment.

Detail Sheets

11. No further comment.
12. No further comment.
13. No further comment.

Stormwater Design and Modeling

14. No further comment.
15. No further comment.
16. No further comment.
17. No further comment.
18. No further comment.

A written response is required to facilitate future reviews. Please contact us if you have any questions.

Very truly yours,
UNDERWOOD ENGINEERS, INC.

Allison M. Rees

Allison M. Rees, P.E.
Project Manager

Robert J. Saunders, P.E.
Senior Project Engineer

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

August 30, 2022

Dave Sharples, Town Planner
Town of Exeter
10 Front Street
Exeter, NH 03833

Re: Plan Revisions
Exeter PB Case #22-9
"Glerups"
19 Continental Drive
Exeter, NH
Altus Project No. 4839

Transmitted via email to: dsharples@exeternh.gov

Dear Mr. Sharples,

Pursuant to comments received at the August 25, 2022 Planning Board hearing and correspondence from Underwoods Engineers dated August 17, 2022, we have made the following plan revisions:

- The gravel parking area shown on the prior plans has been revised to pavement and the sidewalk and curb was extended along the side of the newly paved lot. The eastern perimeter access road remains gravel as before. These alterations had a small ripple effect though the set, hence the new revision date on each affected sheet.

- Note #23 has been added to the Utility Plan Sheet C-5 specifying coordination requirements around testing of the existing water main from Continental Drive.

Altus hopes that the above information satisfies your concerns. Please call me if you have any questions or need any additional information. Thank you for your time and consideration.

Sincerely,

ALTUS ENGINEERING, INC.

Erik Saari
Vice President

ebs/4839.01-LTR-Town-083022

Cc: Allison Rees, Underwood Engineers

Enclosures

CASE #22-9

THIS DRAWING SET HAS NOT BEEN RELEASED FOR CONSTRUCTION

glerups

19 Continental Drive
Exeter, NH

Assessor's Parcel 46, Lot 7

Plan Issue Date:

August 30, 2022 Planning Board

Owner/Applicant:

glerups, inc.
27 Pleasant Street
Newfields, NH 03856
(603) 978-7683

Civil Engineer:

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Architect:

PROCON
CONNECT • CREATE • CONSTRUCT
PO Box 4430
Manchester, NH 031108
(603) 623-8811

Surveyor:

Hayner/Swanson, Inc.
CIVIL ENGINEERS/LAND SURVEYORS
Three Congress Street
Nashua, New Hampshire
03062-3301
Tel 603-883-2057

Landscape Architect:

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

Lighting Consultant:

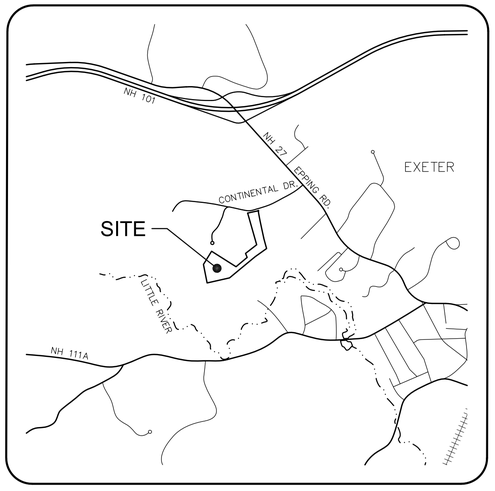
VISIBLELIGHT
24 STICKNEY TERRACE, SUITE 6
HAMPTON, NH 03842
(603) 926-6049

Wetland Scientist:

GOVE ENVIRONMENTAL SERVICES, INC.
Wetlands and Soil Mapping
8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / Fax (603) 778 0654

Traffic Engineer:

Stephen G. Pernaw & Company, Inc.
P.O. Box 1721, Concord, NH 03302
(603) 731-8000

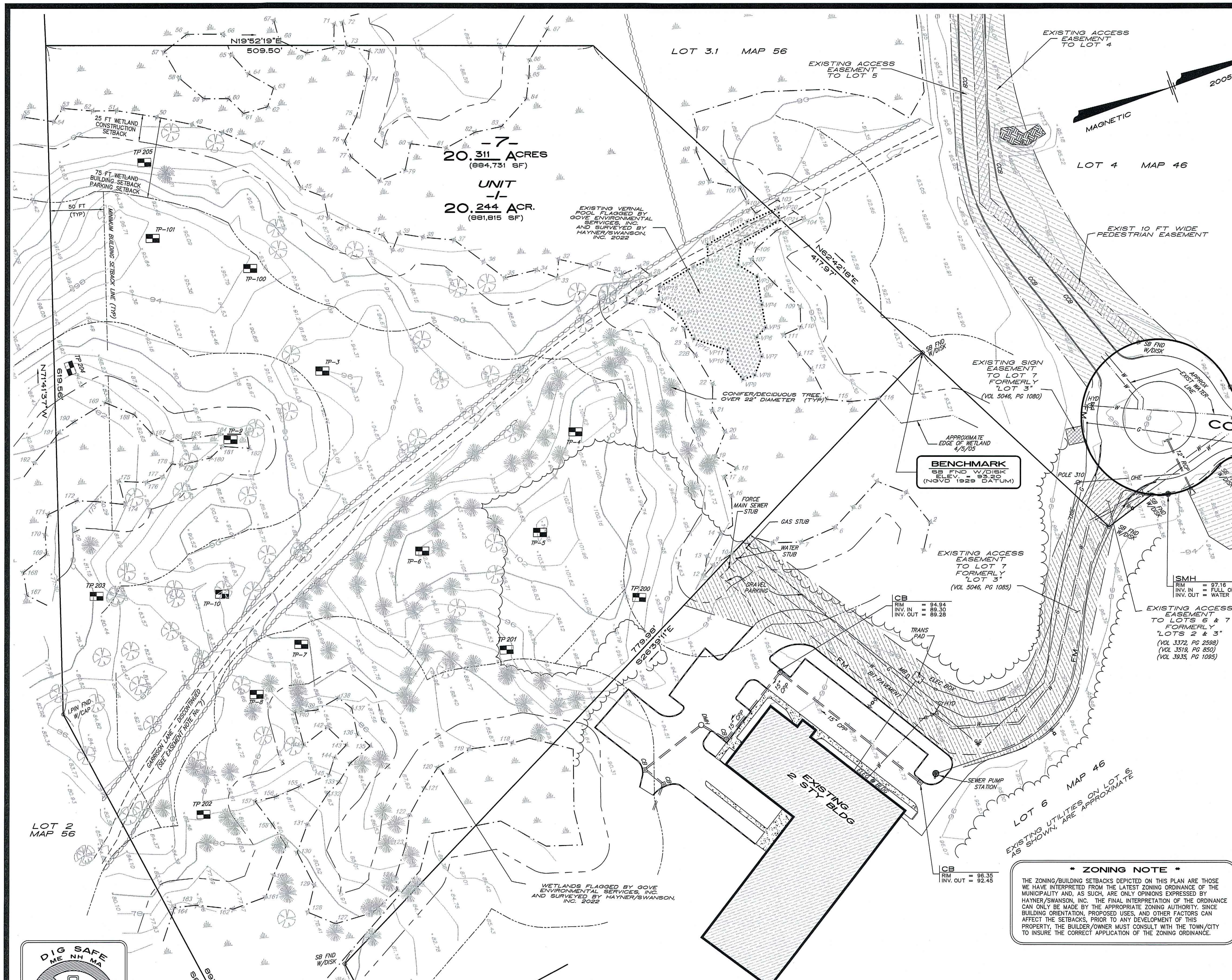


LOCUS NOT TO SCALE

Sheet Index Title	*Sheet Desig.:*	*Sheet No.:*	*Rev.*	*Date*
Existing Conditions Plan	SV-1	2	0	05/05/22
Existing Conditions Plan	SV-2	3	0	05/05/22
Site Plan	C-1	4	2	08/30/22
Stormwater Management Plan	C-2	5	2	08/30/22
Erosion and Sediment Control Plan	C-3	6	2	08/30/22
Utility Plan	C-4	7	2	08/30/22
Wetland/Conditional Use Permit Plan	C-5	8	2	08/30/22
Lighting Plan	C-6	9	2	08/30/22
Detail Sheet	C-7	10	1	07/26/22
Detail Sheet	C-8	11	1	05/31/22
Detail Sheet	C-9	12	0	07/26/22
Detail Sheet	C-10	13	1	07/26/22
Detail Sheet	C-11	14	1	07/26/22
Detail Sheet	C-12	15	0	05/31/22
Detail Sheet	C-13	16	0	05/31/22
Detail Sheet	C-14	17	1	07/26/22
Landscape Plan	L-1	18	1	07/07/22
Architectural Perspective	–	19	0	04/11/22
Architectural Perspective	–	20	0	04/11/22
Architectural Perspective	–	21	0	04/11/22
Architectural Perspective	–	22	0	04/11/22

Permit Summary:	*Submitted*	*Received*
Exeter Site Plan Review	05/31/22	–
NHDES Alteration of Terrain	08/03/22	–
NHDES Wetlands	06/29/22	–
EPA Notice of Intent	By Contractor 14 days prior to construction	

P4839



NOTE

SEE SHEET SV-2 FOR EASEMENTS RIGHTS AND RESTRICTIONS NOTES

▸ UTILITY NOTE ◂

THE UNDERGROUND UTILITIES DEPICTED HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND PLOTTED FROM EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES DEPICTED COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND PORTIONS OF THE UTILITIES.

PLAN REFERENCES:

1. LOT CONSOLIDATION/RESUBDIVISION PLAN PACKAGE, GARRISON GLEN CORPORATE PARK, EXETER, NEW HAMPSHIRE, , SCALE: 1"= 100', DATED: JANUARY 8, 1998 WITH REVISIONS THRU 11/06/01, AND PREPARED BY HOLDEN ENGINEERING & SURVEYING, INC. BEDFORD, NH. RECORDED: RCRD - PLAN No. D-26568
2. EASEMENT PLAN, LOTS 6 & 7, MAP 46, EXETER TENNIS FACILITY, 19 CONTINENTAL DRIVE, EXETER, NEW HAMPSHIRE, PREPARED FOR: HOLDING COURT, LLC, RECORD OWNERS: GARRISON GLEN, LLC AND PERRY CORPORATE CENTER, LLC, SCALE: 1" = 50', DATED: 7 JULY 2009, AND PREPARED BY THIS OFFICE
RECORDED: RCRD - PLAN No. D-36051
3. CONDOMINIUM SITE PLAN LOT 7 MAP 46 7 CONTINENTAL DRIVE EXETER NEW HAMPSHIRE PREPARED FOR HOLDING COURT LLC, SCALE: 1"= 60' DATED: MARCH 8, 2013 BY THIS OFFICE RECORDED: RCRD – PLAN D-37672

50 0 50 100 150 200 FEET
25 0 25 50 METERS
SCALE: 1"=50 Feet
1"=15.240 Meters

NOTES:

1. TOTAL SITE AREA: 20.311 ACRES (884,731 SF)
2. PRESENT ZONING: ***CT-1;*** CORPORATE/TECHNOLOGY PARK-1

MINIMUM LOT REQUIREMENTS	
- LOT AREA	2 ACRES
- LOT WIDTH	250 FT
- LOT DEPTH	250 FT
- BUILDING HEIGHT	50 FT
MINIMUM YARD SETBACKS	
- FRONT YARD	75 FT
- SIDE YARD	30 FT
- REAR YARD	50 FT
WETLAND SETBACKS	
- BUILDING	75 FT
- PARKING	75 FT
- CONSTRUCTION	25 FT

3. LOT NUMBERS REFER TO THE CITY OF EXETER ASSESSORS MAPS 46, 47, AND 56.
4. SITE IS TO BE SERVICED BY MUNICIPAL SEWER AND WATER BY EXETER PUBLIC WORKS.
5. PURPOSE OF PLAN:
TO DEPICT THE EXISTING CONDITIONS OF A PORTION OF LOT 7
6. A PORTION OF THIS PARCEL LIES WITHIN A SPECIAL FLOOD HAZARD AREA "ZONE A" AS DETERMINED FROM THE FLOOD INSURANCE RATE MAP (FIRM), ROCKINGHAM COUNTY, TOWN OF EXETER, NEW HAMPSHIRE, COMMUNITY No. 330130, PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, MAP NUMBER: 33015C0401E, DATED: MAY 17, 2005.
7. THE EXISTING TOPOGRAPHY IS BASED ON AN ACTUAL FIELD SURVEY MADE ON THE GROUND BETWEEN MARCH 2005 AND JULY 2006, AND IS IN ACCORDANCE WITH THE TOWN OF EXETER REGULATIONS.
8. HORIZONTAL DATUM: ASSUMED
PROJECTION: MAGNETIC 2005
VERTICAL DATUM: NGVD 1929
9. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE ACCURACY OF THE EXISTING TOPOGRAPHY PRIOR TO EARTHWORK OPERATIONS. NO CLAIM FOR EXTRA WORK DUE TO TOPOGRAPHIC INACCURACY SHALL BE CONSIDERED AFTER EARTHWORK HAS COMMENCED.
10. THE CONTRACTOR SHALL ONLY USE BENCHMARKS AS PROVIDED BY THE ENGINEER.
11. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL VERIFY THE EXISTING UTILITY STUBS LOCATIONS, SIZE AND ELEVATION AT THE END OF LOT 6.
12. **DECLARANT / UNIT 2:**
HOLDING COURT LLC
c/o MARKS PANETH
685 THIRD AVENUE
NEW YORK, NY 10017
VOL 5040 PG 1960

UNIT 1:
GLERUPS, INC.
321 DAME ROAD
DURHAM, NH 03824
VOL 6267 PG 2278

* ZONING NOTE *

THE ZONING/BUILDING SETBACKS DEPICTED ON THIS PLAN ARE THOSE WE HAVE INTERPRETED FROM THE LATEST ZONING ORDINANCE OF THE MUNICIPALITY AND, AS SUCH, ARE ONLY OPINIONS EXPRESSED BY HAYNER/SWANSON, INC. THE FINAL INTERPRETATION OF THE ORDINANCE CAN ONLY BE MADE BY THE APPROPRIATE ZONING AUTHORITY. SINCE BUILDING ORIENTATION, PROPOSED USES, AND OTHER FACTORS CAN AFFECT THE SETBACKS, PRIOR TO ANY DEVELOPMENT OF THIS PROPERTY, THE BUILDER/OWNER MUST CONSULT WITH THE TOWN/CITY TO INSURE THE CORRECT APPLICATION OF THE ZONING ORDINANCE.

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ME NH MA
CONTACT DIG SAFE 72 HOURS PRIOR TO CONSTRUCTION
digsafe.com
1-888-DIG SAFE
1-888-344-7233

SURVEYORS CERTIFICATION

I HEREBY CERTIFY, TO MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THIS PLAN SHOWS THE RESULTS OF AN ON THE GROUND "STANDARD PROPERTY SURVEY" AND THAT SAID SURVEY MEETS THE MINIMUM PRECISION AND/OR ACCURACY MEASUREMENTS FOR SURVEY CLASSIFICATION "U" (URBAN) AS SET FORTH IN TABLE 500.1 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS ADOPTED 08/23/01, EFFECTIVE 01/01/09.

I FURTHER CERTIFY THAT THIS PLAN IS THE RESULT OF AN ACTUAL FIELD SURVEY MADE ON THE GROUND AND HAS A MAXIMUM ERROR OF CLOSURE OF ONE PART IN FIFTEEN THOUSAND ON ALL PROPERTY LINES WITHIN AND BORDERING THE SUBJECT PROPERTY.

7/12/22
DATE

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 860 LEE B. GAGNON
LEE B. GAGNON, LLS

WETLAND CERTIFICATION

WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES INC. ON 12/17/21 UTILIZING THE FOLLOWING STANDARDS:
1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.2. UNITED STATES DEPARTMENT OF AGRICULTURE (2018).
3. NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2019 VERSION 4, FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.
4. U.S. ARMY CORPS OF ENGINEERS NATIONAL WETLAND PLANT LIST, VERSION 3.5. (2020)
5. CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. USFW MANUAL FWS/OBS–79/31 (1979).

STATE OF NEW HAMPSHIRE BRENDAN QUIGLEY No. 249 CERTIFIED WETLAND SCIENTIST 5-27-22

No.	DATE	REVISION	BY
1	07/12/22	ADD TEST PIT LOCATIONS	LBG

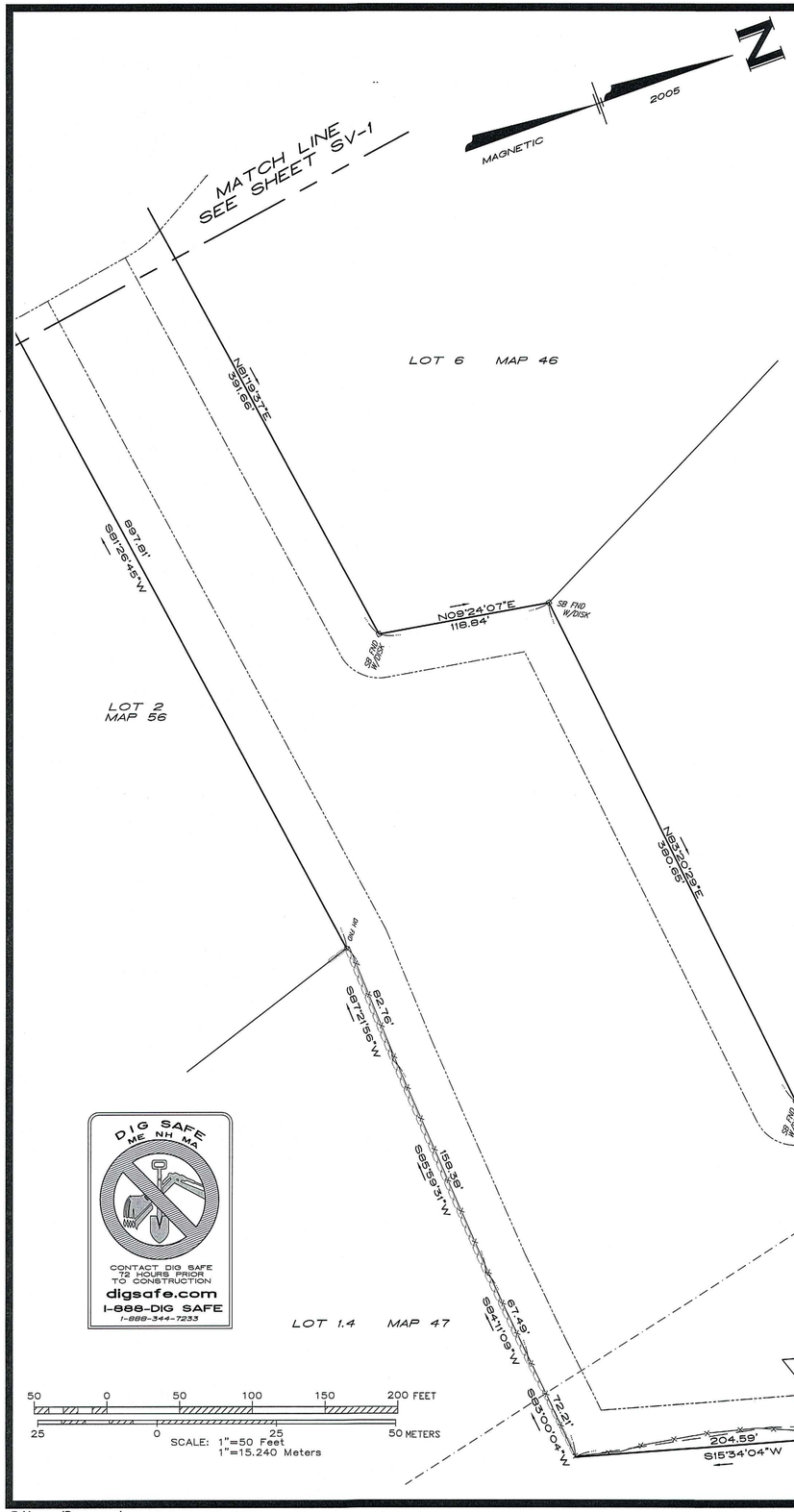
PREPARED FOR:
ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801

DECLARANT:
HOLDING COURT, LLC
141 MAIN STREET NASHUA, NEW HAMPSHIRE 03060

EXISTING CONDITIONS PLAN
(LOT 7, MAP 46)
19 CONTINENTAL DRIVE
EXETER, NEW HAMPSHIRE

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Three Congress Street Nashua, New Hampshire 03062-3301
Tel (603) 883-2057 Fax (603) 883-5057
www.hayner-swanson.com

FIELD BOOK: 1133/1134 | DWG LOCATION: J:\4000\4891\DWG\ALTUS
DRAWING NAME: HC-EC51-REV | Scale 1" = 50'
Sheet SV-1 | File Number 4891-HC | Date 05 MAY 2022



CERTIFICATION

I HEREBY CERTIFY, TO MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THIS PLAN SHOWS THE RESULTS OF AN ON THE GROUND "STANDARD PROPERTY SURVEY" AND THAT SAID SURVEY MEETS THE MINIMUM PRECISION AND/OR ACCURACY MEASUREMENTS FOR SURVEY CLASSIFICATION "U" (URBAN) AS SET FORTH IN TABLE 500.1 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS ADOPTED 08/23/01, EFFECTIVE 01/01/09.

I FURTHER CERTIFY THAT THIS PLAN IS THE RESULT OF AN ACTUAL FIELD SURVEY MADE ON THE GROUND AND HAS A MAXIMUM ERROR OF CLOSURE OF ONE PART IN FIFTEEN THOUSAND ON ALL PROPERTY LINES WITHIN AND BORDERING THE SUBJECT PROPERTY.

7/12/22
DATE

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — NO. 860 — LEE B. DAGNON — SURVEYOR

EASEMENTS RIGHTS AND RESTRICTIONS:

1. DECLARATION OF EASEMENTS AND PROTECTIVE COVENANTS FOR GARRISON GLEN CORPORATE PARK AS RECORDED IN BK. 3372 PG. 2598 AND AMENDED BY BK. 3519 PG. 850 AND BK. 3935 PG. 1095.
2. SUBJECT TO AND WITH THE BENEFIT OF A SIGN EASEMENT AGREEMENT BETWEEN GARRISON GLEN, LLC AND HOLDING COURT, LLC AS RECORDED AT BK. 5040 PG. 1963 AND RERECORDED AT BK. 5046 PG. 1080.
3. TOGETHER WITH AND SUBJECT TO MODIFICATION OF ACCESS EASEMENT AND MUTUAL CROSS AGREEMENT RECORDED AT BK. 5040 PG. 1968 AND RERECORDED AT BK. 5046 PG. 1085.
4. SUBJECT TO A LEASE TO TELECORP REALTY, LLC BK. 3438 PG. 2189 AS CLARIFIED BY BK. 3471 PG. 1312 AND AS ASSIGNED TO GARRISON GLEN, LLC BY ASSIGNMENT F LEASE BK. 4404 PG. 2745.
5. SUBJECT TO MEMORANDUM OF LEASE BETWEEN GARRISON GLEN, LLC AND GTP TOWERS VII, LLC RECORDED AT BK. 5115 PG. 2484.
6. DECLARATION OF CONDOMINIUM OF HOLDING COURT CONDOMINIUM DATED MARCH 28, 2013 RECORDED AR BK. 5423 PG. 2946 AS AMENDED BY BK. 5805 PG. 132 AS DEPICTED ON PLAN No. 37672.
7. GARRISON LANE WAS DISCONTINUED BY TOWN OF EXETER WARRANT ARTICLE No. 40 ON MARCH 10, 1998.

LEGEND

- EXISTING GROUND CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED GRADE
- PROPOSED SPOT GRADE
- STORM DRAIN & CATCHBASIN
- STORM DRAIN & MANHOLE
- STORM DRAIN & HEADWALL
- FORCE MAIN
- WATER MAIN & HYDRANT
- WATER MAIN & GATE VALVE
- GAS LINE & GATE VALVE
- UTILITY POLE WITH GUY SUPPORT
- STREET LIGHT
- OVERHEAD ELECTRIC & TELEPHONE
- UNDERGROUND ELEC/TEL & MANHOLES
- SIGN
- TREE LINE
- STONE BOUND
- IRON PIN
- STONE BOUND TO BE SET
- IRON PIN TO BE SET
- WETLAND FLAGGING LIMIT
- BUILDING SETBACK LINE
- WIRE FENCE
- CURBING
- HANDICAP PARKING SPACE
- PARKING SPACE COUNT
- STORMWATER RUNOFF DIRECTION
- DECIDUOUS/CONIFEROUS TREE OVER 22" IN DIAMETER

ZONING NOTE

THE ZONING/BUILDING SETBACKS DEPICTED ON THIS PLAN ARE THOSE WE HAVE INTERPRETED FROM THE LATEST ZONING ORDINANCE OF THE MUNICIPALITY AND, AS SUCH, ARE ONLY OPINIONS EXPRESSED BY HAYNER/SWANSON, INC. THE FINAL INTERPRETATION OF THE ORDINANCE CAN ONLY BE MADE BY THE APPROPRIATE ZONING AUTHORITY. SINCE BUILDING ORIENTATION, PROPOSED USES, AND OTHER FACTORS CAN AFFECT THE SETBACKS, PRIOR TO ANY DEVELOPMENT OF THIS PROPERTY, THE BUILDER/OWNER MUST CONSULT WITH THE TOWN/CITY TO INSURE THE CORRECT APPLICATION OF THE ZONING ORDINANCE.

UTILITY NOTE

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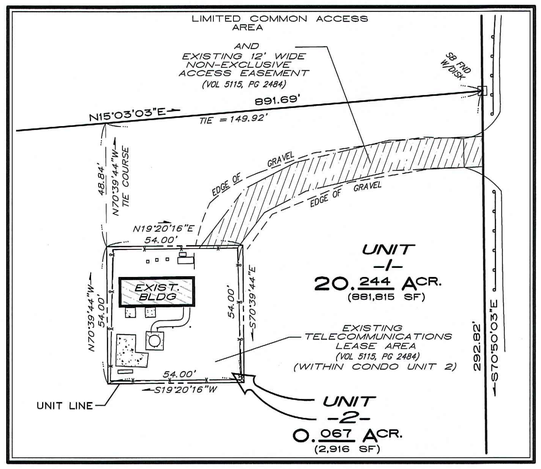

DETAIL 'A'
SCALE: 1" = 30'

LOT 5 MAP 46

LIMITED COMMON ACCESS AREA AND EXISTING 12' WIDE NON EXCLUSIVE ACCESS EASEMENT (VOL 5115, PG 2484)

SB FND W/DISK

N15°03'03"E
891.69'

30 FT (TYP)
MINIMUM BUILDING SETBACK LINE (TYP)

-7-
20.311 ACRES
(884,731 SF)

UNIT
-1-
20.244 ACR.
(881,815 SF)

UNIT LINE

EXISTING TELECOMMUNICATIONS LEASE AREA
(VOL 5115, PG 2484)
(WITHIN CONDO UNIT 2)

TOWER
GENER.
TRANS

UNIT
-2-
0.067 ACR.
(2,916 SF)
SEE DETAIL 'A'

CONTINENTAL DRIVE (PUBLIC)
(SEE VOL 4622, PG 1993)

S15°05'03"E
292.82'

75 FT (TYP)

S23°32'28"W
10.30'

APPROXIMATE 100 YEAR FLOOD PLAIN

LINE PER H.C.R.D. PLAN No. 28075

204.59' S15°34'04"W
105.99' S16°43'55"W
250.17' S18°53'25"W
213.41' S19°15'19"W
143.81' S19°59'06"W
110.89' S21°12'14"W
5.24' S18°25'16"W

DH FND
DH SET

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1-888-DIG SAFE
1-888-344-7233

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No.	DATE	REVISION	BY
1	07/12/22	ADD TEST PIT LOCATIONS	LBG

PREPARED FOR:
ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801

DECLARANT:
HOLDING COURT, LLC
141 MAIN STREET NASHUA, NEW HAMPSHIRE 03060

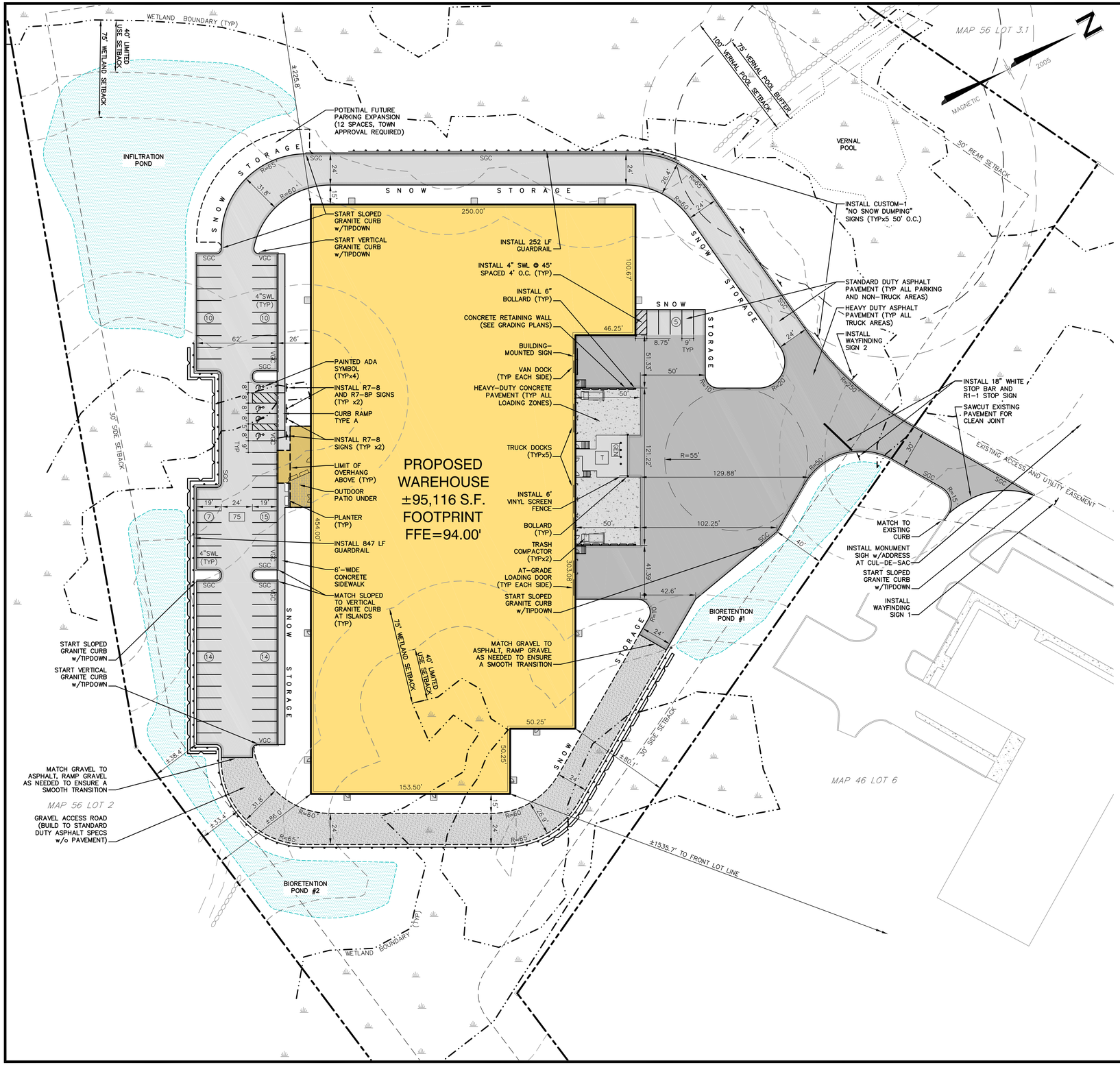
19 CONTINENTAL DRIVE

EXISTING CONDITIONS PLAN
(LOT 7, MAP 46)

EXETER, NEW HAMPSHIRE

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Three Congress Street Nashua, New Hampshire 03062-3301
Tel (603) 883-2057 Fax (603) 883-5057
www.haynerswanson.com

FIELD BOOK: 1153/1134	DWG LOCATION: X:\4000\4891\DWG\ALTUS
DRAWING NAME: HC-ESTI-REV	Scale: 1" = 50'
SV-2	Date: 05 MAY 2022
4891-HC	Field Work:



SITE NOTES

1. DESIGN INTENT – THIS PLAN SET IS INTENDED TO DEPICT THE DEVELOPMENT OF THE SITE FOR A WAREHOUSE USE.
2. LOT AREA: ±884,731 S.F. (±20.24 ACRES)
3. REFERENCE DEED: RCRD BOOK 6267 PAGE 2278
4. ZONE: CORPORATE/TECHNOLOGY PARK – 1 (CT-1)
5. DIMENSIONAL REQUIREMENTS – CT-1:

MIN. LOT AREA:	87,120 S.F.
MIN. STREET FRONTAGE:	250' (292.82' PROVIDED)
FRONT SETBACK:	75' (±1535.7' PROVIDED)
SIDE SETBACK:	30' (±80.1' PROVIDED)
REAR SETBACK:	50' (±225.8' PROVIDED)
MAX. BUILDING HEIGHT:	50' (60' IF 200' FROM RESIDENTIAL ZONE/USE)
MAX. BLDG. COVERAGE:	40% (10.8% PROPOSED)
MIN. OPEN SPACE:	30% (78.9%/695,689 SF PROVIDED)
PARKING SETBACK:	10' (±38.4' PROVIDED)
WETLAND SETBACKS:	40' LIMITED USE (POORLY DRAINED)
	50' LIMITED USE (VERY POORLY DRAINED)
	75' PARKING/STRUCTURE
	75' LIMITED USE (VERNAL POOL)
	100' PARKING/STRUCTURE (VERNAL POOL)

4. PARKING REQUIREMENTS:
   9'x19' SPACES, 22' AISLES (24' PROPOSED FOR FIRE LANE)
   WAREHOUSE: 1 SPACE/EMPLOYEE MAX. SHIFT (BUT NOT <25% GFA)
   75 EMPLOYEES ON MAXIMUM SHIFT = 75 SPACES
   TOTAL PARKING REQUIRED = 75 SPACES
   TOTAL PARKING PROVIDED = 75 SPACES
5. CONDITIONAL USE PERMIT UNDER ZONING SECTION 9.1.6 REQUIRED FOR SITE DEVELOPMENT IN THE WETLANDS CONSERVATION OVERLAY DISTRICT.
6. OVERALL AREA OF DISTURBANCE OVER 100,000 S.F., NHDES ALTERATION OF TERRAIN PERMIT REQUIRED.
7. AREA OF DISTURBANCE OVER 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT REQUIRED (NOI TO BE PREPARED AND SUBMITTED BY CONTRACTOR, SWPPP AND INSPECTIONS TO BE PREPARED AND PERFORMED BY CONTRACTOR).
8. WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC. ON DECEMBER 17, 2021. A VERNAL POOL ASSESSMENT WAS CONDUCTED BY GES IN MAY OF 2022.
9. SNOW SHALL BE STORED AT THE EDGE OF PAVEMENT, IN AREAS SHOWN HEREON, AND/OR TRUCKED OFF SITE AS APPROPRIATE.
10. PAVEMENT MARKINGS SHALL BE CONSTRUCTED USING WHITE, YELLOW OR BLUE TRAFFIC PAINT (WHERE SPECIFIED) MEETING THE REQUIREMENTS OF AASHTO M248, TYPE F OR EQUAL. PAINTED ISLANDS AND LOADING ZONES SHALL BE 4"-WIDE DIAGONAL WHITE LINES 3'-0" O.C. BORDERED BY 4"-WIDE WHITE LINES. PARKING STALLS SHALL BE SEPARATED BY 4"-WIDE WHITE LINES. SEE DETAILS FOR HANDICAP SYMBOLS, SIGNS AND SIGN DETAILS.
11. PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC DEVICES," "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" AND THE AMERICANS WITH DISABILITIES ACT (ADA), LATEST EDITIONS.
12. ALL CONSTRUCTION SHALL MEET THE MINIMUM STANDARDS OF THE TOWN OF EXETER & NHDOT'S STANDARD SPECIFICATION FOR ROAD & BRIDGE CONSTRUCTION, LATEST EDITIONS. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
13. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINES WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
14. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
15. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
16. UNLESS OTHERWISE NOTED, ALL NEW CURBING SHALL BE VERTICAL OR SLOPED GRANITE WITH A MINIMUM RADIUS OF 4'.
17. EXETER SITE PLAN APPROVAL WILL BE REQUIRED IF BUILDING CONSTRUCTION IS PHASED.
18. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PRIOR TO CONSTRUCTION. ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION.
19. BUILDING AREA SHOWN IS BASED ON FOOTPRINT MEASURED TO THE EDGE OF FOUNDATIONS AND/OR SLABS. ACTUAL INTERIOR SPACE WILL DIFFER.
20. GRAVEL PARKING AREAS AND TRAVEL LANES SHALL BE CONSTRUCTED PER THE STANDARD DUTY PAVEMENT CROSS SECTION WITH ASPHALT OMITTED. GRAVEL FINISH GRADES SHALL BE TO THE TOP OF PAVEMENT SUBGRADE.
21. WETLAND BOUNDARY MARKERS MEETING THE REQUIREMENTS OF THE TOWN OF EXETER SHALL BE PLACED ALONG THE WETLAND BOUNDARY WITHIN THE PROJECT LIMITS AT 100' MINIMUM INTERVALS.
22. ALL WATER, SEWER, ROAD (INCLUDING PARKING LOT), AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.3 STORMWATER STANDARDS, STORMWATER MANAGEMENT PLAN, STORMWATER POLLUTION PREVENTION PLAN, AND EROSION AND SEDIMENT CONTROL STANDARDS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE.
23. TOWN OF EXETER SIGN PERMIT REQUIRED.
24. SEE SHEET C-11 FOR LEGEND.

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)

ALTUS ENGINEERING, INC.
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STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER –
8/30/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: AUGUST 30, 2022

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NEWFIELDS, NH 03856

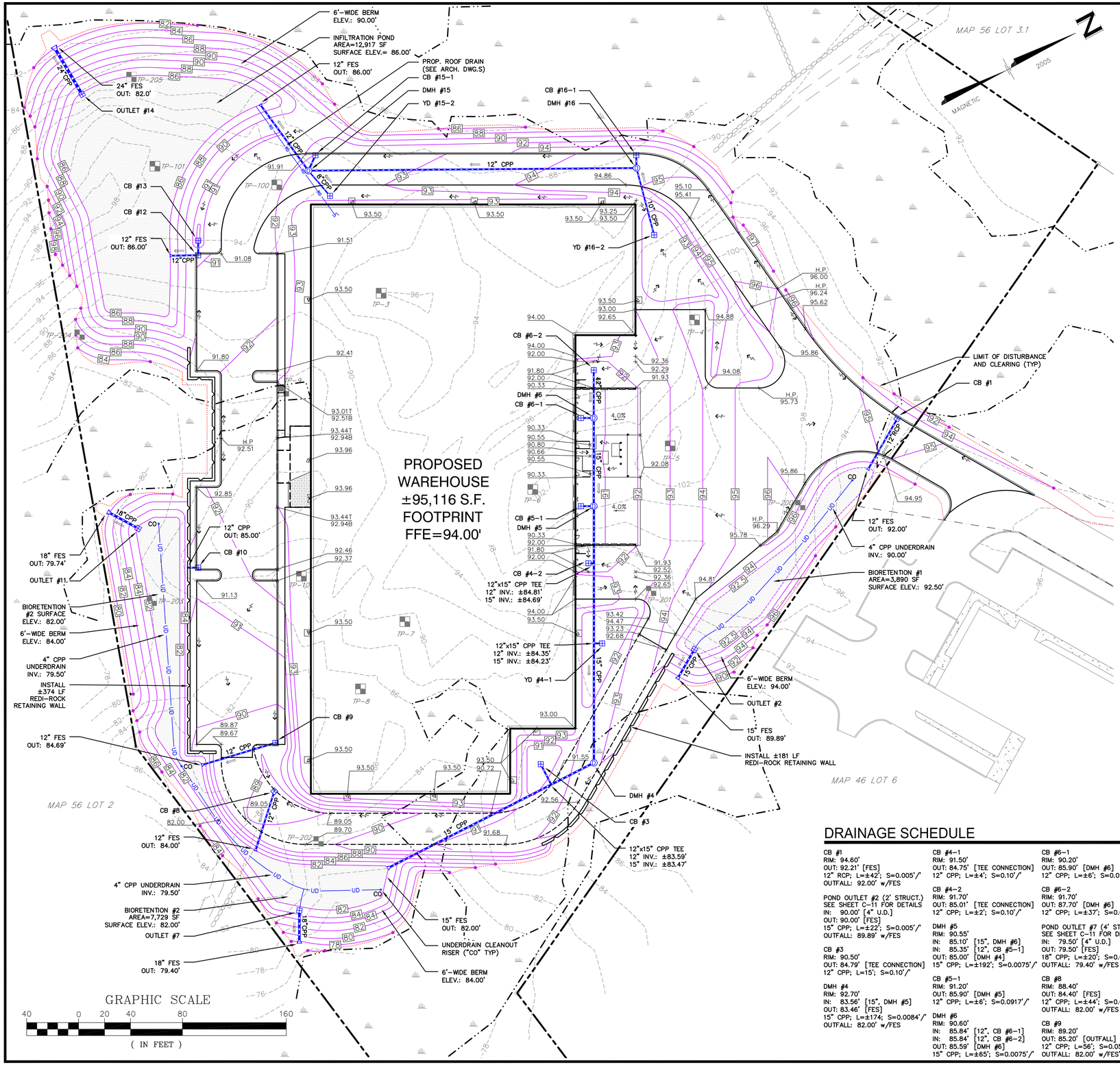
APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
SITE PLAN

SHEET NUMBER:
C - 1

P4839



GRADING AND DRAINAGE NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. THE LIMITS OF CONSTRUCTION DISTURBANCE SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO ANY TREE CLEARING, STUMPING, GRUBBING OR EARTH MOVING OCCURS. WHERE CONSTRUCTION IS TO TAKE PLACE WITHIN 50' OF A PROPERTY LINE, THE PROPERTY LINE SHALL BE STAKED AT 50' MINIMUM INTERVALS.
4. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
5. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
6. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
7. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
8. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
9. DRAINAGE PIPE SHALL BE CORRUGATED POLYETHYLENE PIPE (CPP), TYPE ADS N-12 OR HANCOR H1-Q, PVC SDR 35 OR REINFORCED CONCRETE PIPE (RCP) WHERE SPECIFIED.
10. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
11. ALL ROOF DRAIN LEADERS SHALL BE LOCATED IN COORDINATION WITH THE ARCHITECTURAL PLANS TO MATCH DOWNSPOUTS. RISERS SHALL BE SET TO FINISH GRADE PLUS 6" (MIN.) IF APPLICABLE.
12. ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
13. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. SYMBOLS MAY NOT BE INDICATIVE OF THE CENTER OF A STRUCTURE, PARTICULARLY WHEN SHOWN ADJACENT TO A CURB LINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
14. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
15. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
16. THE APPLICANT HAS COMPLETED A LAND USE TRACKING FORM, MOST RECENT REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING AND ACCOUNTING PILOT PROJECT (PTAPP) PORTAL AT https://www.unh.edu/unhsc/ptapp (PTAPP SUBMISSION ID 209).
17. CONTRACTOR SHALL PROVIDE RETAINING WALL DESIGN DRAWINGS STAMPED BY A NH-LICENSED PROFESSIONAL STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. DESIGN MUST BE PRE-APPROVED BY SELECTED WALL MANUFACTURER.
18. CONTRACTOR MAY CONNECT BUILDING AND RETAINING FOUNDATION DRAINS TO THE NEAREST DRAINAGE STRUCTURE PROVIDED A MINIMUM 1% SLOPE CAN BE MAINTAINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL FOUNDATION DRAINS WITH THE BUILDING AND WALL PLANS.
19. DRAINAGE OUTFALLS AT RETAINING WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE WALL MANUFACTURERS SPECIFICATIONS.
20. ADJUST GRADING AT EMERGENCY BUILDING EXITS AS NECESSARY TO ENSURE CODE COMPLIANCE. COORDINATE WITH ARCHITECT IF RAILINGS ARE REQUIRED.
21. SEE SHEET C-11 FOR LEGEND.

DRAINAGE SCHEDULE

CB #1
RIM: 94.60'
OUT: 92.21' [FES]
12" RCP; L=±42'; S=0.005'/'
OUTFALL: 92.00' w/FES

POND OUTLET #2 (2' STRUCT.)
SEE SHEET C-11 FOR DETAILS
IN: 90.00' [4" U.D.]
OUT: 90.00' [FES]
15" CPP; L=±22'; S=0.005'/'
OUTFALL: 89.89' w/FES

CB #3
RIM: 90.50'
OUT: 84.79' [TEE CONNECTION]
12" CPP; L=15'; S=0.10'/'

DMH #4
RIM: 92.70'
IN: 83.56' [15", DMH #5]
OUT: 83.46' [FES]
15" CPP; L=±174; S=0.0084'/'
OUTFALL: 82.00' w/FES

CB #4-1
RIM: 91.50'
OUT: 84.75' [TEE CONNECTION]
12" CPP; L=±4'; S=0.10'/'

CB #4-2
RIM: 91.70'
OUT: 85.01' [TEE CONNECTION]
12" CPP; L=±2'; S=0.10'/'

DMH #5
RIM: 90.55'
IN: 85.10' [15", DMH #6]
IN: 85.35' [12", CB #5-1]
OUT: 85.00' [DMH #4]
15" CPP; L=±192'; S=0.0075'/'

CB #5-1
RIM: 91.20'
OUT: 85.90' [DMH #5]
12" CPP; L=±6'; S=0.0917'/'

DMH #6
RIM: 90.60'
IN: 85.84' [12", CB #6-1]
IN: 85.84' [12", CB #6-2]
OUT: 85.59' [DMH #6]
15" CPP; L=±65'; S=0.0075'/'

CB #6-1
RIM: 90.20'
OUT: 85.90' [DMH #6]
12" CPP; L=±6'; S=0.01'/'

CB #6-2
RIM: 91.70'
OUT: 87.70' [DMH #6]
12" CPP; L=±37'; S=0.0503'/'

POND OUTLET #7 (4' STRUCT.)
SEE SHEET C-11 FOR DETAILS
IN: 79.50' [4" U.D.]
OUT: 79.50' [FES]
18" CPP; L=±20'; S=0.01'/'
OUTFALL: 79.40' w/FES

CB #8
RIM: 88.40'
OUT: 84.40' [FES]
12" CPP; L=±44'; S=0.0545'/'
OUTFALL: 82.00' w/FES

CB #9
RIM: 89.20'
OUT: 85.20' [OUTFALL]
12" CPP; L=56'; S=0.0571'/'
OUTFALL: 82.00' w/FES'

CB #10
RIM: 91.25'
OUT: 85.6' [OUTFALL]
12" CPP; L=±6'; S=0.10'/'
OUTFALL: 85.00'

POND OUTLET #11 (4' STRUCT.)
SEE SHEET C-11 FOR DETAILS
OUT: 80.00' [FES]
18" CPP; L=±26'; S=0.01'/'
OUTFALL: 79.74'

CB #12
RIM: 90.90'
IN: 86.28' [12", CB #13]
OUT: 86.18' [FES]
12" CPP; L=±18'; S=0.01'/'
OUTFALL: 86.00' w/FES

CB #13
RIM: 89.85'
OUT: 86.35' [CB #12]
12" CPP; L=±7'; S=0.01'/'

POND OUTLET #14 (4' STRUCT.)
SEE SHEET C-11 FOR DETAILS
OUT: 82.20' [FES]
24" CPP; L=±40'; S=0.005'/'
OUTFALL: 82.00'

DMH #15
RIM: 92.20'
IN: 86.70' [12", DMH #16]
IN: 87.90' [12", CB #15-1]
IN: 88.20' [8", YD #15-2]
OUT: 86.60' [FES]
12" CPP; L=±60'; S=0.01'/'
OUTFALL: 86.00' w/FES

CB #15-1
RIM: 92.00'
OUT: 88.00' [DMH #15]
12" CPP; L=±10'; S=0.01'/'

YD #15-2
RIM: 92.40'
OUT: 88.40' [DMH #15]
8" CPP; L=±20'; S=0.01'/'

DMH #16
RIM: 94.65'
IN: 89.85 [12", CB #16-1]
IN: 89.53' [8", YD #16-2]
OUT: 89.20' [DMH #15]
12" CPP; L=±250'; S=0.01'/'

CB #16-1
RIM: 94.40'
OUT: 90.40' [DMH #16]
12" CPP; L=±11'; S=0.05'/'

YD #16-2
RIM: 92.50'
OUT: 89.78' [DMH #16]
10" CPP; L=±50'; S=0.005'/'

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27 PLEASANT STREET
NEWFIELDS, NH 03856

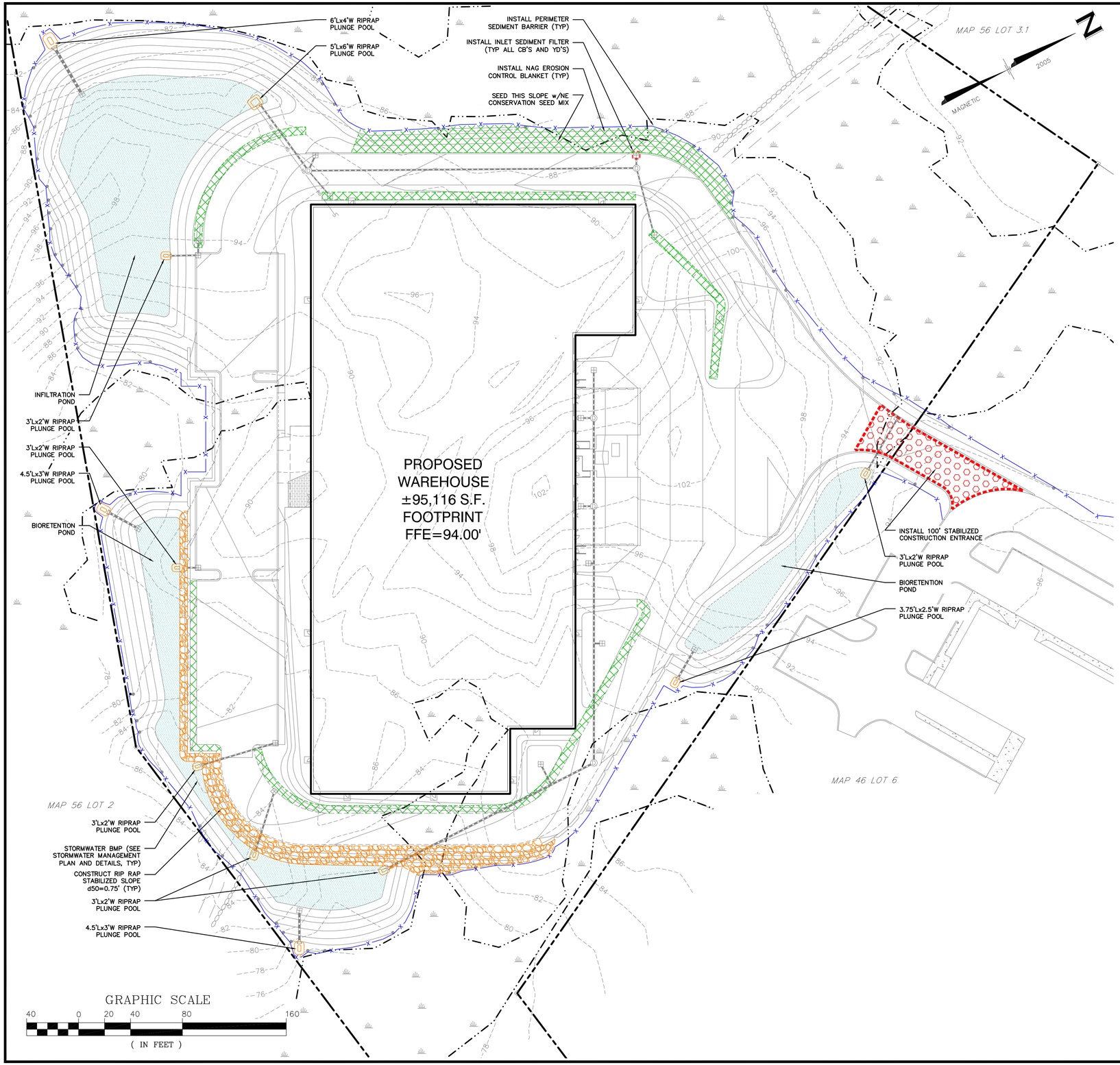
APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
STORMWATER MANAGEMENT PLAN

SHEET NUMBER:
C - 2

P4839



EROSION AND SEDIMENT CONTROL NOTES

1. PROJECT SUBJECT TO EPA NPDES PHASE II. NOI, SWPPP AND MINIMUM WEEKLY INSPECTIONS REQUIRED. NOI TO BE PREPARED AND SUBMITTED BY CONTRACTOR, SWPPP AND INSPECTIONS TO BE PREPARED AND PERFORMED BY CONTRACTOR. CONTRACTOR SHALL FILE NOI WITH EPA 2 WEEKS PRIOR TO CONSTRUCTION.
2. AREA OF DISTURBANCE = ±304,350 S.F. (INCLUDES OFFSITE WORK). NHDES ALTERATION OF TERRAIN PERMIT REQUIRED.
3. AREA OF WETLAND IMPACT = 9,548 S.F. (448 S.F. TEMPORARY, 9,100 S.F. PERMANENT) NHDES DREDGE AND FILL PERMIT REQUIRED.
4. PERIMETER SEDIMENT CONTROLS AND CULVERT AND CATCH BASIN INLET PROTECTION MEASURES SHALL BE INSTALLED AFTER TREE CLEARING OPERATIONS HAVE CEASED AND BEFORE ANY STUMPING, GRUBBING OR OTHER EARTH DISTURBANCE.
5. GRIND STUMPS AND REUSE GRINDINGS FOR EROSION CONTROL WHERE POSSIBLE OR TRUCK OFFSITE. NO STUMPS SHALL BE BURIED ON SITE.
6. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED.
7. SEE DETAIL SHEETS FOR PERTINENT SEDIMENT AND EROSION CONTROL DETAILS AND ADDITIONAL NOTES.
8. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH BY THE NEW HAMPSHIRE OF ENVIRONMENTAL SERVICES.
9. THE CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND/OR ENTERING WETLANDS AND ENSURE PERMANENT SOIL STABILIZATION.
10. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
11. ALL EROSION CONTROL BLANKETS AND FASTENERS SHALL BE BIODEGRADEABLE.
12. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
13. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF LOAM, LIMESTONE, FERTILIZER, SEED, AND MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES. SEE DETAILS FOR ADDITIONAL INFORMATION.
14. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
15. UPON COMPLETION OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
16. CONTRACTOR SHALL READ AND FOLLOW ALL CONDITIONS OF APPROVAL IN THE SITE'S NHDES ALTERATION OF TERRAIN, NHDES WETLANDS, ARMY CORPS OF ENGINEER'S AND TOWN OF EXETER SITE PLAN PERMITS.
17. CONSTRUCTION ACTIVITIES SHALL BE MANAGED IN STRICT ACCORDANCE WITH NH RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES. NO INVASIVE SPECIES SHALL BE INSTALLED ON THE PROJECT SITE FOR ANY REASON.
18. FUGITIVE DUST SHALL BE CONTROLLED DURING CONSTRUCTION IN ACCORDANCE WITH ENV-A 1000. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT DUST FROM LEAVING THE SITE. THIS SHALL INCLUDE BUT NOT BE LIMITED TO THE PROACTIVE MANAGEMENT OF STOCKPILES, MATERIALS PROCESSING ACTIVITIES, VEHICULAR TRAFFIC, THE EXCAVATION AND PLACEMENT OF EARTH MATERIALS, SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
19. PERIMETER SEDIMENT CONTROLS SHALL BE PLACED AT THE LIMIT OF DISTURBANCE.
20. NEW ENGLAND CONSERVATION SEED MIX AVAILABLE FROM NEW ENGLAND WETLAND PLANTS, INC., 14 PEARL LANE, SOUTH HADLEY, MA 01075, (413) 548-8000. THIS IS NOT INTENDED TO BE AN EXCLUSIVE SUPPLIER. THE CONTRACTOR MAY USE ANY SUPPLIER PROVIDED THAT THE PLANTS AND SEED MIXTURES MEET THE PROJECT SPECIFICATIONS. THE CONTRACTOR SHOULD NOTE THAT LOCAL NEW ENGLAND SUPPLIERS ARE PREFERABLE.
21. SEE SHEET C-7 FOR BLASTING BEST MANAGEMENT PRACTICES.
22. SEE SHEET C-11 FOR LEGEND.

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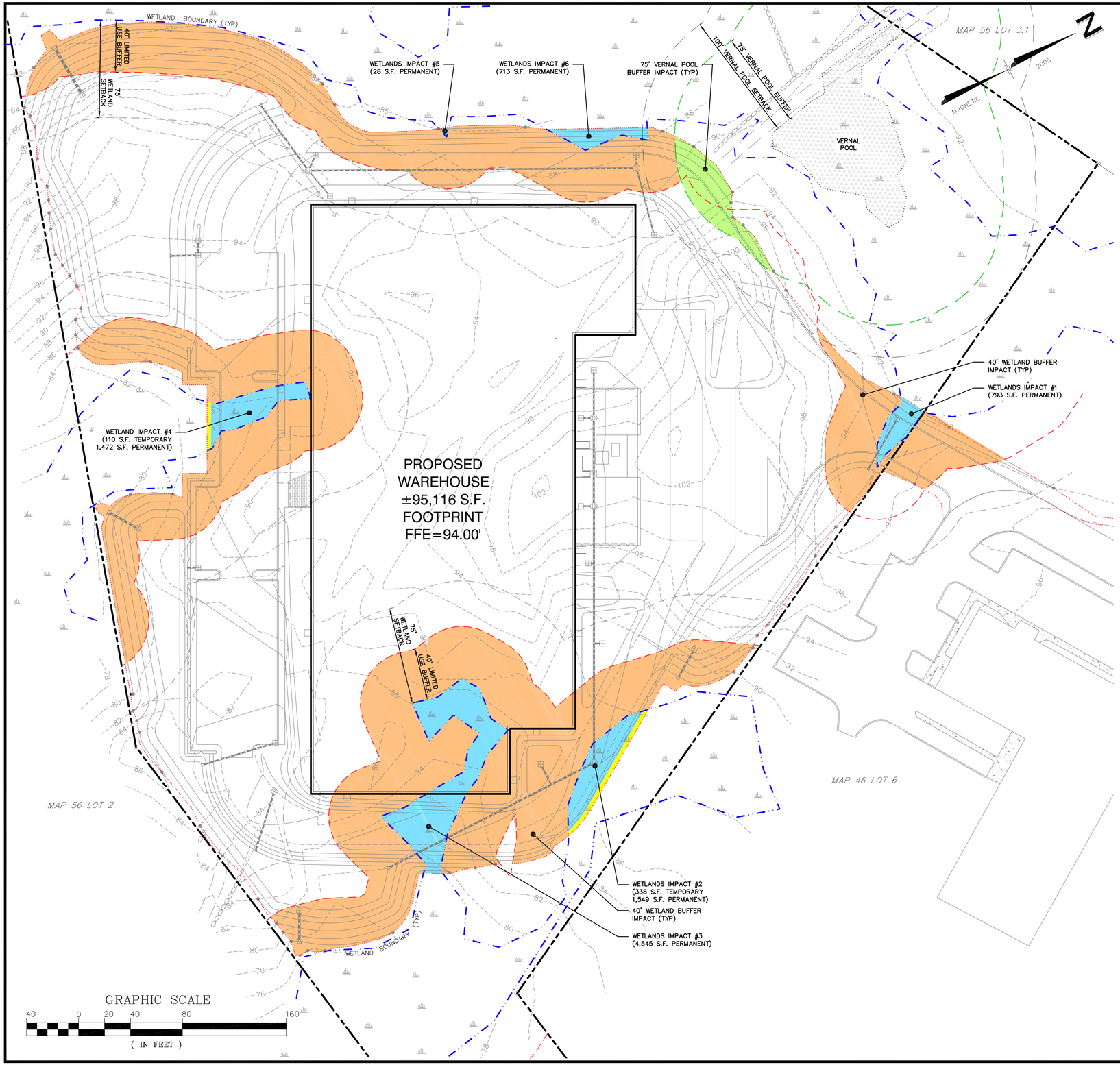
PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER:
C - 3

P4839



WETLAND NOTES

1. NHDES WETLAND IMPACT ANALYSIS:

	AREA
TEMPORARY IMPACT:	448 S.F.
PERMANENT IMPACT:	9,100 S.F.
TOTAL WETLAND IMPACT:	9,548 S.F.

2. TOWN OF EXETER WETLAND BUFFER IMPACT ANALYSIS:

	AREA
40' WETLAND BUFFER:	75,952 S.F.
75' VERNAL POOL BUFFER:	2,231 S.F.
TOTAL BUFFER IMPACT:	78,183 S.F.

3. A VERNAL POOL ASSESSMENT WAS CONDUCTED BY GOVE ENVIRONMENTAL SERVICES, INC. IN MAY OF 2022.

4. WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES INC. ON 12/17/21 UTILIZING THE FOLLOWING STANDARDS:

- REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
- FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.2. UNITED STATES DEPARTMENT OF AGRICULTURE (2018).
- NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2019 VERSION 4, FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.
- U.S. ARMY CORPS OF ENGINEERS NATIONAL WETLAND PLANT LIST, VERSION 3.5. (2020)
- CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. USFW MANUAL FWS/OBS-79/31 (1979).

LEGEND

- 40' WETLAND SETBACK
- 75' VERNAL POOL BUFFER
- LIMIT OF PROJECT DISTURBANCE
- WETLAND BOUNDARY
- VERNAL POOL
- PROPOSED 40' WETLAND BUFFER IMPACT
- PROPOSED 75' VERNAL POOL BUFFER IMAPCT
- PROPOSED TEMPORARY WETLAND IMPACT
- PROPOSED PERMANENT WETLAND IMPACT

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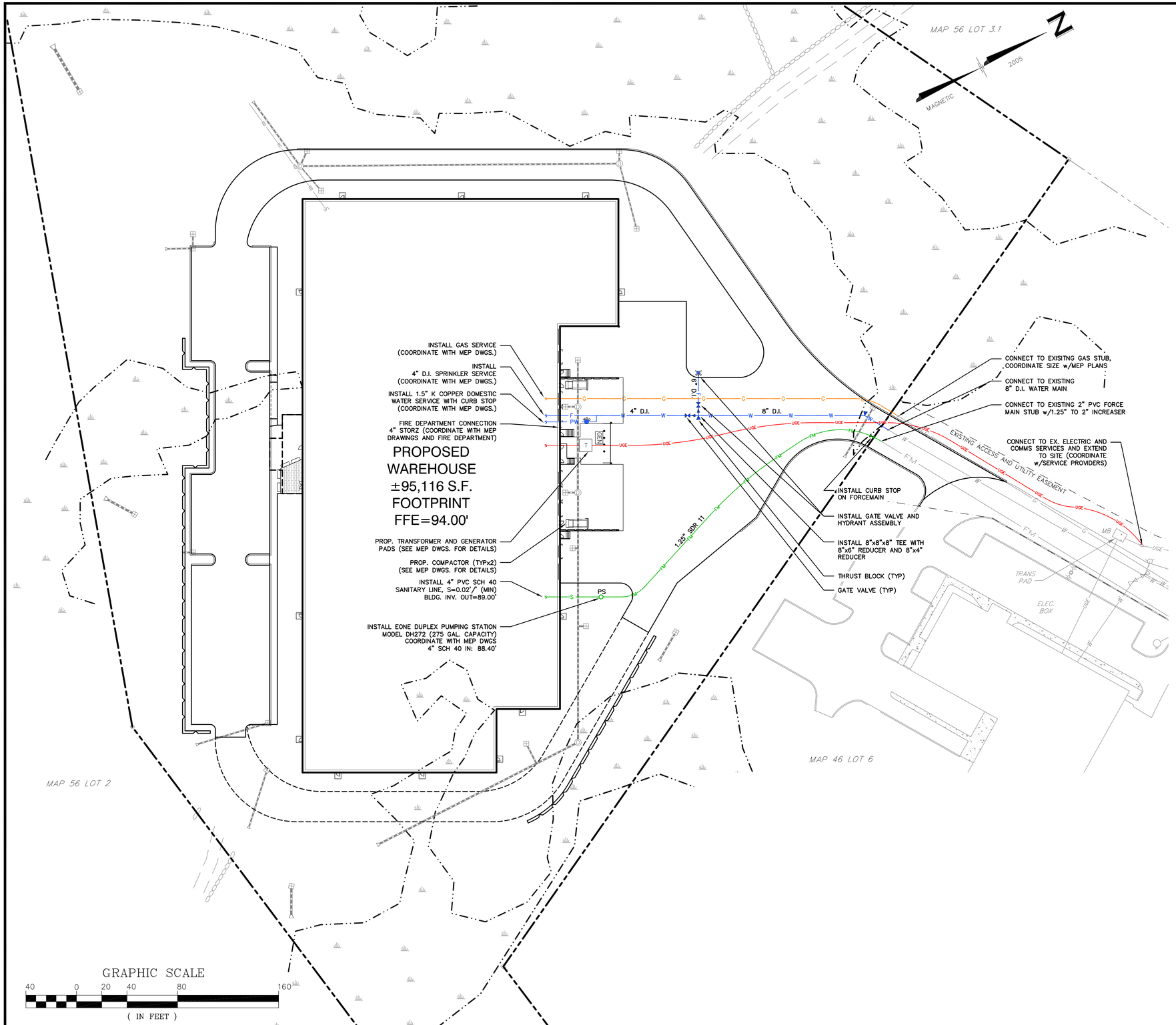
PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
WETLAND AND CONDITIONAL USE PERMIT PLAN

SHEET NUMBER:
C - 4

P4839



UTILITY NOTES

1. THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE. CATCH BASINS, MANHOLES, WATER GATES, ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY PROVIDERS AND GOVERNMENTAL AGENCIES. AS SUCH, THEY ARE NOT INCLUSIVE AS OTHER UTILITIES AND UNDERGROUND STRUCTURES THAT ARE NOT SHOWN ON THE PLANS MAY EXIST. THE ENGINEER, SURVEYOR AND OWNER ACCEPT NO RESPONSIBILITY FOR POTENTIAL INACCURACIES IN THE PLAN AND/OR UNFORESEEN CONDITIONS. THE CONTRACTOR SHALL NOTIFY, IN WRITING, SAID AGENCIES, UTILITY PROVIDERS, TOWN OF EXTER DPW AND OWNER'S AUTHORIZED REPRESENTATIVE AND CALL DIG SAFE AT 1 (800) DIG-SAFE AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO ANY EXCAVATION WORK.
2. PRIOR TO CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING AND PROPOSED STORMWATER AND UTILITY LINES. CONFLICTS SHALL BE ANTICIPATED AND ALL EXISTING LINES TO BE RETAINED SHALL BE PROTECTED. ANY DAMAGE DONE TO EXISTING UTILITIES SHALL BE REPAIRED AND, IF NECESSARY, EXISTING UTILITIES SHALL BE RELOCATED AT NO EXTRA COST TO THE OWNER. ALL CONFLICTS SHALL BE RESOLVED WITH THE INVOLVEMENT OF THE ENGINEER, DPW AND APPROPRIATE UTILITIES.
3. THE SITE IS SERVED BY MUNICIPAL WATER AND SEWER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF ALL BONDS AND PAYMENT OF ALL TAP, TIE-IN AND CONNECTION FEES.
5. ALL ROAD/LANE CLOSURES OR OTHER TRAFFIC INTERRUPTIONS SHALL BE COORDINATED WITH THE EXETER POLICE DEPARTMENT AND DPW AT LEAST TWO WEEKS PRIOR TO COMMENCING RELATED CONSTRUCTION.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCHING, BEDDING, BACKFILL & COMPACTION FOR ALL UTILITY TRENCHING IN ADDITION TO ALL CONDUIT INSTALLATION AND COORDINATION OF ALL REQUIRED INSPECTIONS.
7. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL OSHA AND CITY REGULATIONS.
8. SEE ARCHITECTURAL/MECHANICAL DRAWINGS FOR EXACT LOCATIONS & ELEVATIONS OF UTILITY CONNECTIONS AT BUILDING. COORDINATE ALL WORK WITHIN FIVE (5) FEET OF BUILDINGS WITH BUILDING CONTRACTOR AND ARCHITECTURAL/MECHANICAL DRAWINGS. ALL CONFLICTS AND DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY AND PRIOR TO COMMENCING RELATED WORK.
9. THE INSTALLATION OF ELECTRIC POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED. SITE PLANS SHALL SHOW ANY EASEMENTS FOR THESE SERVICES.
10. APPROVED BACKFLOW PREVENTORS SHALL BE PROVIDED FOR BOTH FIRE AND DOMESTIC WATER LINES.
11. FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE ARCHITECT, CONTRACTOR, APPROPRIATE UTILITY COMPANIES AND THE EXETER DPW.
12. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
13. UTILITY PROVIDERS AND CONTACTS:
    - WATER & SEWER: EXETER PUBLIC WORKS, PAUL VLASICH, TOWN ENGINEER, (603) 773-6157.
    - GAS: UNITIL, DAVID MACLEAN, (603) 294-5144.
    - TELECOMMUNICATIONS: CONSOLIDATED, JASON CUNHA, (603) 325-2041.
    - CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
    - ELECTRICAL: EVERSOURCE, NICK KOSKO, (603) 332-4227. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL, 48-HOUR MINIMUM NOTICE REQUIRED.
11. CONTRACTOR TO PROVIDE BOLLARDS AT SERVICE ENTRANCES PER THE SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.
12. ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL BE CONSTRUCTED AND TESTED PER EXETER DPW STANDARDS AND SPECIFICATIONS. ALL OTHER UTILITIES SHALL BE TO THE STANDARDS AND SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.
13. WHERE WATER LINES CROSS, RUN ADJACENT TO OR ARE WITHIN 5' OF STORM DRAINAGE PIPES OR STRUCTURES, 2"-THICK CLOSED CELL RIGID BOARD INSULATION SHALL BE INSTALLED FOR FROST PROTECTION.
14. WATER AND SANITARY SEWER LINES SHALL BE LOCATED AT LEAST 10' HORIZONTALLY FROM EACH OTHER. WHERE CROSSING, 18" MINIMUM VERTICAL CLEARANCE SHALL BE PROVIDED WITH WATER INSTALLED OVER SEWER.
15. THE CONTRACTOR SHALL CONFIRM ALL UTILITY LINE AND CONDUIT SIZES WITH THE MEP PLANS AND SERVICE PROVIDERS PRIOR TO INSTALLATION. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
16. FIRE ALARM PANELS SHALL BE MONITORED THROUGH A THIRD-PARTY SECURITY COMPANY. CONTRACTOR SHALL COORDINATE PANEL LOCATIONS AND INTERCONNECTIONS WITH CITY FIRE DEPARTMENT AND ARCHITECT.
17. FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED ON THE BUILDING AS SHOWN. COORDINATE WITH THE MEP PLANS AND THE CITY FIRE DEPARTMENT. ACCESS TO THE FDC SHALL BE MAINTAINED AS A CLEAR AND UNOBSTRUCTED PATH AT ALL TIMES.
18. THE PROPOSED STRUCTURE SHALL BE SERVED BY A SPRINKLER SYSTEM AS REQUIRED UNDER THE 2015 STATE BUILDING CODES.
19. SPRINKLER CONNECTIONS MUST BE FLUSHED IN ACCORDANCE WITH NFPA 24 AND A CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING FORM MUST BE COMPLETED.
20. THE TOWN OF EXETER SHALL BE GRANTED A BLANKET EASEMENT FOR ACCESS TO ALL WATER VALVES AND FIRE HYDRANTS.
21. UNLESS OTHERWISE DETERMINED BY THE UTILITY PROVIDER, ALL ELECTRICAL TRANSFORMERS AND SWITCHES SHALL REMAIN THE PROPERTY OF EVERSOURCE.
22. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL HANDHOLES, FITTINGS, CONNECTORS, COVER PLATES AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED IN THIS DRAWING SET IN ORDER TO RENDER THE FULL INSTALLATION OF COMPLETE AND OPERATIONAL UTILITY AND DRAINAGE SYSTEMS.
23. CONTRACTOR TO COORDINATE WITH EXETER DPW FOR WATERLINE TESTING AND PROCEDURE TO PLACE EXISTING LINE FROM CONTINENTAL DRIVE INTO SERVICE, INSTALL NEW GATE VALVE IF REQUIRED.
24. SEE SHEET C-11 FOR LEGEND.

WATER/SEWER FLOW CALCULATIONS

INDUSTRIAL BUILDING:
15 GPD/EMPLOYEE (TYPICAL FLOW RATE)
15 GPD * 75 EMPLOYEES = 1,125 GPD

(CALCULATED FROM METCALF & EDDY/AECOM "WASTEWATER ENGINEERING TREATMENT AND RESOURCE RECOVERY", 5TH EDITION)

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER -
8/30/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: AUGUST 30, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	DISCUSSION	EBS	05/31/22
1	PER REVIEW COMMENTS	EBS	07/26/22
2	PER REVIEW COMMENTS	EBS	08/30/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 4839-SITE.dwg

SCALE:
22" x 34" - 1" = 40'
11" x 17" - 1" = 80'

OWNER:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

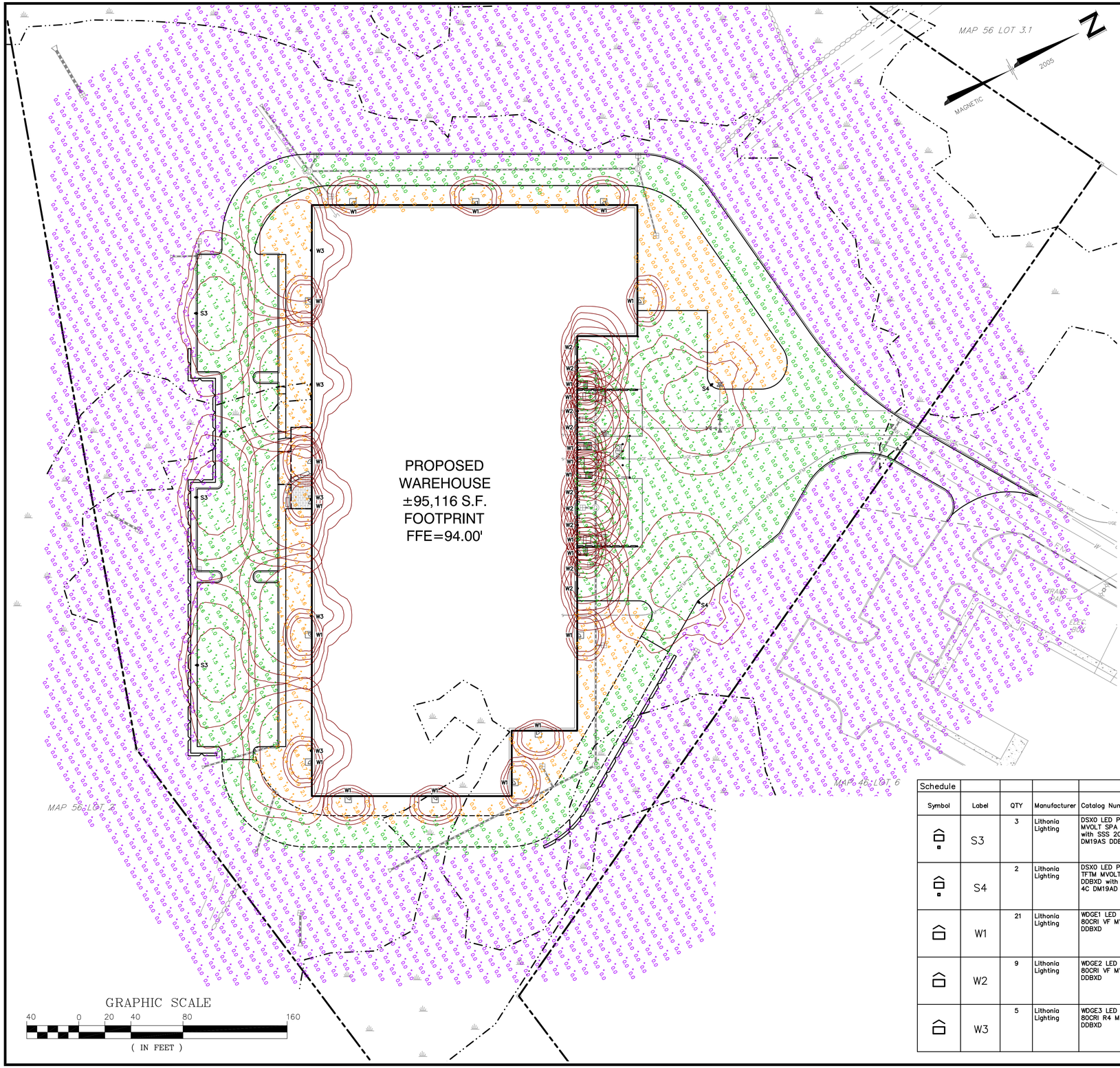
APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
UTILITY PLAN

SHEET NUMBER:
C - 5

P4839



LIGHTING NOTES

1. SITE ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF UNDERGROUND UTILITY AND DRAINAGE INFRASTRUCTURE BEFORE INSTALLING POLE BASES.
2. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES TO INCLUDE LIGHTING CONDUIT, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
3. LIGHTING CONDUIT SHALL BE PVC SCH 40.
4. ALL LIGHTING MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE AND LOCAL REGULATIONS.
5. ALL PARKING LOT AND DRIVEWAY LIGHTING FIXTURES SHALL BE FULL CUT-OFF AND 3000K COLOR TEMPERATURE SO AS TO BE DARK-SKY COMPLIANT.
6. CONTRACTOR SHALL COORDINATE WITH ARCHITECT AND BUILDING ELECTRICAL CONTRACTOR FOR ALL SITE ELECTRICAL WORK INCLUDING BUT NOT LIMITED TO ALL SERVICE ENTRANCES/EXITS, RISERS, CIRCUITRY, METERS, SUB-METERS, ETC.
7. COORDINATE WITH ARCHITECTURAL PLANS FOR ALL BUILDING-MOUNTED AND LANDSCAPE FIXTURES, TYPES, LOCATIONS AND WIRING.
8. LUMINAIRE DATA IS TESTED TO INDUSTRY STANDARDS UNDER LABORATORY CONDITIONS. OPERATING VOLTAGE AND NORMAL MANUFACTURING TOLERANCES OF LAMP BALLAST AND LUMINAIRE MAY AFFECT FIELD RESULTS.
9. EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.
10. ALL SITE LIGHTING SHALL BE EQUIPPED WITH A TIMER TO EITHER SHUT OFF OR REDUCE IN INTENSITY AT 10PM OF EVERY EVENING.
11. THIS LIGHTING DESIGN IS BASED ON LIMITED INFORMATION PROVIDED BY VISIBLE LIGHT, INC., 24 STICKNEY TERRACE, SUITE 6, HAMPTON, NH 03842. FIELD DEVIATIONS MAY SIGNIFICANTLY AFFECT PREDICTED PERFORMANCE. PRIOR TO INSTALLATION, CRITICAL SITE INFORMATION (POLE LOCATIONS, ORIENTATION, MOUNTING HEIGHT, CIRCUITRY, ETC.) SHALL BE COORDINATED BETWEEN THE CONTRACTOR, ARCHITECT AND SPECIFIER.
12. SEE DETAIL SHEETS POLE BASE AND CONDUIT TRENCH DETAILS.
13. SEE SHEET C-11 FOR LEGEND.

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Landscape Island	+	1.5 fc	10.7fc	0.0 fc	N/A	N/A
Outside of Parking Lot	+	0.0 fc	1.6 fc	0.0 fc	N/A	N/A
Parking Lot	+	1.0 fc	17.2fc	0.0 fc	N/A	N/A

Schedule

Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp	Filename	Lumens per Lamp	LLF	Wattage	Distribution
	S3	3	Lithonia Lighting	DSX0 LED P3 30K T3M MVOLT SPA DDBXD with SSS 20 4C DM19AS DDBXD	DSX0 LED Area Fixture; mounted at 22ft (20ft pole on 2ft base)	LED	DSX0_LED_P3_30K_T3M_MVOLT.ies	6172	0.9	71	TYPE III, MEDIUM, BUG RATING: B2 – U0 – G2
	S4	2	Lithonia Lighting	DSX0 LED P3 30K TFTM MVOLT SPA DDBXD with SSS 20 4C DM19AD DDBXD	DSX0 LED Area Fixture; mounted at 22ft (20ft pole on 2ft base)	LED	DSX0_LED_P3_30K_TFTM_MVOLT.ies	7841	0.9	71	TYPE IV, SHORT, BUG RATING: B2 – U0 – G2
	W1	21	Lithonia Lighting	WDGE1 LED P2 30K 80CRI VF MVOLT SRM DDBXD	WDGE1 LED Wallpack; mounted above mandoors at 10ft	LED	WDGE1_LED_P3_30K_80CRI_VF.ies	1872	0.9	15.0178	TYPE II, VERY SHORT BUG RATING: B1 – U0 G0
	W2	9	Lithonia Lighting	WDGE2 LED P5 30K 80CRI VF MVOLT SRM DDBXD	WDGE2 LED Wallpack; mounted at 15ft	LED	WDGE2_LED_P5_30K_80CRI_VF.ies	5771	0.9	48.44	TYPE III, VERY SHORT, BUG RATING: B1 – U0 – G1
	W3	5	Lithonia Lighting	WDGE3 LED P4 30K 80CRI R4 MVOLT SRM DDBXD	WDGE3 LED Wallpack; mounted at 18ft	LED	WDGE3_LED_P4_70CRI_R4_30K.ies	11554	0.9	87.8914	TYPE IV, SHORT, BUG RATING: B2 – U0 G2

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VISIBLELIGHT

NOT FOR CONSTRUCTION

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ISSUE DATE: AUGUST 30, 2022

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NEWFIELDS, NH 03856

APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
LIGHTING PLAN

SHEET NUMBER:
C - 6

P4839

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

19 CONTINENTAL DRIVE
EXETER, NEW HAMPSHIRE
TAX MAP 46 LOT 7

LATITUDE: 42.991° N
LONGITUDE: 70.982° W

OWNER/APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

DESCRIPTION

The project consists of the development of a ±95,116 s.f. warehouse and associated improvements.

DISTURBED AREA

The total area to be disturbed for the development is ±304,350 S.F. (±6.99 acres).

PROJECT PHASING

The project will be completed in one phase.

NAME OF RECEIVING WATER

The site drains to an unnamed wetland tributary to the Little River.

SEQUENCE OF MAJOR ACTIVITIES

1. Install temporary erosion control measures including perimeter controls, stabilized construction entrance and inlet sediment filters as noted on the plan. All temporary erosion control measures shall be maintained in good working condition for the duration of the project.
2. Delineate limits of disturbance.
3. Remove trees, stumps and brush strip loam and stockpile.
4. Demolish existing site features, buildings, utilities, pavement, etc. as shown on Demolition Plan.
5. Construct building foundations.
6. Rough grade site including placement of borrow materials.
7. Construct new buildings and associated improvements.
8. Construct drainage structures, culverts, utilities & pavement base course materials.
9. Install base course paving & curbing.
10. Install top course paving and sidewalks.
11. Loam (6" min) and seed on all disturbed areas not paved or otherwise stabilized.
12. Install landscaping.
13. When all construction activity is complete and site is stabilized, remove all temporary erosion control measures and any sediment that has been trapped by these devices.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, perimeter controls shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area and permanent measures are established, perimeter controls shall be removed.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through appropriate perimeter controls. All storm drain inlets shall be provided with inlet protection measures.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.25 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built–up sediment shall be removed from perimeter barriers when it has reached one–third the height of the barrier or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. An area shall be considered stable if one of the following has occurred:
   a. Base coarse gravels have been installed in areas to be paved;
   b. A minimum of 85% vegetated growth as been established;
   c. A minimum of 3 inches of non–erosive material such as stone of riprap has been installed; – or –
   d. Erosion control blankets have been properly installed.
9. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
   a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
   b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrubs.
Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1–1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6"screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen. *The organic portion needs to be fibrous and elongated. *Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. *The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. PERMANENT SEEDING –

1. Bedding – stones larger than ½", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.

2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and organic fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

   Agricultural Limestone @ 100 lbs. per 1,000 s.f.
   10–20–20 organic fertilizer @ 12 lbs. per 1,000 s.f.

3. Seed Mixture (for lawns**):

Type	Lbs. / Acre	Lbs. / 1,000 sf
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Seed Mixture (For slope embankments**):
Grass Seed: Provide fresh, clean, new–crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified:

Type	Min. Purity (%)	Min. Germination (%)	Kg./Hectare (Lbs/Acre)
Creeping Red Fescue (c)	96	85	45 (40)
Perennial Rye Grass (a)	98	90	35 (30)
Redtop	95	80	5 (5)
Alsike Clover	97	90(e)	5 (5)
		Total	90 (80)

   a. Ryegrass shall be a certified fine–textured variety such as Pennfine, Fiesta, Yorktown, Diplomat, or equal.
   b. Fescue varieties shall include – Creeping Red and/or Hard Reliant, Scaldis, Koket, or Jamestown.
   ** In the event that the seed mixes shown here conflict with the project landscape plans, the landscape plans shall govern.

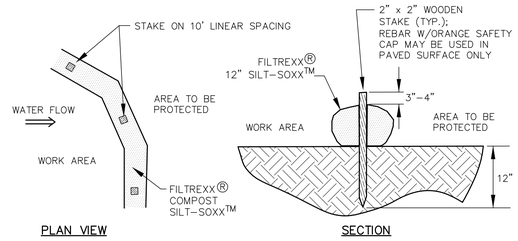
4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;

2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and

3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.



NOTES:
1. SILTSOXX MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER — NOT TO SCALE

BEST MANAGEMENT PRACTICES FOR BLASTING

REFERENCE: NHDES WD–19–05

PURPOSE: ALL ACTIVITIES RELATED TO BLASTING SHALL FOLLOW BEST MANAGEMENT PRACTICES (BMPS) TO PREVENT CONTAMINATION OF GROUNDWATER INCLUDING PREPARING, REVIEWING AND FOLLOWING AN APPROVED BLASTING PLAN; PROPER DRILLING, EXPLOSIVE HANDING AND LOADING PROCEDURES; OBSERVING THE ENTIRE BLASTING PROCEDURES; EVALUATING BLASTING PERFORMANCE; AND HANDLING AND STORAGE OF BLASTED ROCK.

LOADING PRACTICES: THE FOLLOWING BLASTHOLE LOADING PRACTICES TO MINIMIZE ENVIRONMENTAL EFFECTS SHALL BE FOLLOWED:

(a) DRILLING LOGS SHALL BE MAINTAINED BY THE DRILLER AND COMMUNICATED DIRECTLY TO THE BLASTER. THE LOGS SHALL INDICATE DEPTHS AND LENGTHS OF VOIDS, CAVITIES, AND FAULT ZONES OR OTHER WEAK ZONES ENCOUNTERED AS WELL AS GROUNDWATER CONDITIONS.

(b) EXPLOSIVE PRODUCTS SHALL BE MANAGED ON-SITE SO THAT THEY ARE EITHER USED IN THE BOREHOLE, RETURNED TO THE DELIVERY VEHICLE, OR PLACED IN SECURE CONTAINERS FOR OFF–SITE DISPOSAL.

(c) SPILLAGE AROUND THE BOREHOLE SHALL EITHER BE PLACED IN THE BOREHOLE OR CLEANED UP AND RETURNED TO AN APPROPRIATE VEHICLE FOR HANDLING OR PLACEMENT IN SECURED CONTAINERS FOR OFF–SITE DISPOSAL.

(d) LOADED EXPLOSIVES SHALL BE DETONATED AS SOON AS POSSIBLE AND SHALL NOT BE LEFT IN THE BLASTHOLES OVERNIGHT, UNLESS WEATHER OR OTHER SAFETY CONCERNS REASONABLY DICTATE THAT DETONATION SHOULD BE POSTPONED.

(e) LOADING EQUIPMENT SHALL BE CLEANED IN AN AREA WHERE WASTEWATER CAN BE PROPERLY CONTAINED AND HANDLED IN A MANNER THAT PREVENTS RELEASE OF CONTAMINANTS TO THE ENVIRONMENT.

(f) EXPLOSIVES SHALL BE LOADED TO MAINTAIN GOOD CONTINUITY IN THE COLUMN LOAD TO PROMOTE COMPLETE DETONATION. INDUSTRY ACCEPTED LOADING PRACTICES FOR PRIMING, STEMMING, DECKING AND COLUMN RISE NEED TO BE ATTENDED TO.

EXPLOSIVE SELECTION: THE FOLLOWING BMPS SHALL BE FOLLOWED TO REDUCE THE POTENTIAL FOR GROUNDWATER CONTAMINATION WHEN EXPLOSIVES ARE USED:

(a) EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT ARE APPROPRIATE FOR SITE CONDITIONS AND SAFE BLAST EXECUTION.

(b) EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT HAVE THE APPROPRIATE WATER RESISTANCE FOR THE SITE CONDITIONS PRESENT TO MINIMIZE THE POTENTIAL FOR HAZARDOUS EFFECT OF THE PRODUCT UPON GROUNDWATER.

PREVENTION OF MISFIRES: APPROPRIATE PRACTICES SHALL BE DEVELOPED AND IMPLEMENTED TO PREVENT MISFIRES.

MUCK PILE MANAGEMENT: MUCK PILES (THE BLASTED PIECES OF ROCK) AND ROCK PILES SHALL BE MANAGED IN A MANNER TO REDUCE THE POTENTIAL FOR CONTAMINATION BY IMPLEMENTING THE FOLLOWING MEASURES:

(a) REMOVE THE MUCK PILE FROM THE BLAST AREA AS SOON AS REASONABLY POSSIBLE.

(b) MANAGE THE INTERACTION OF BLASTED ROCK PILES AND STORMWATER TO PREVENT CONTAMINATION OF WATER SUPPLY WELLS OR SURFACE WATER.

SPILL PREVENTION MEASURES AND SPILL MITIGATION: SPILL PREVENTION AND SPILL MITIGATION MEASURES SHALL BE IMPLEMENTED TO PREVENT THE RELEASE OF FUEL AND OTHER RELATED SUBSTANCES TO THE ENVIRONMENT. THE MEASURES SHALL INCLUDE AT A MINIMUM:

(a) THE FUEL STORAGE REQUIREMENTS SHALL INCLUDE:
1. STORAGE OF REGULATED SUBSTANCES ON AN IMPERVIOUS SURFACE.
2. SECURE STORAGE AREAS AGAINST UNAUTHORIZED ENTRY.
3. LABEL REGULATED CONTAINERS CLEARLY AND VISIBLY.
4. INSPECT STORAGE AREAS WEEKLY.
5. COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS.
6. WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS.
7. SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.

(b) THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
1. EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED.
2. PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS.
3. HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS.
4. USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES.
5. PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.

(c) THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.

(d) FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT WILL COMPLY WITH THE REGULATIONS OF NHDES [NOTE THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6: "BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT"OR ITS SUCCESSOR DOCUMENT].

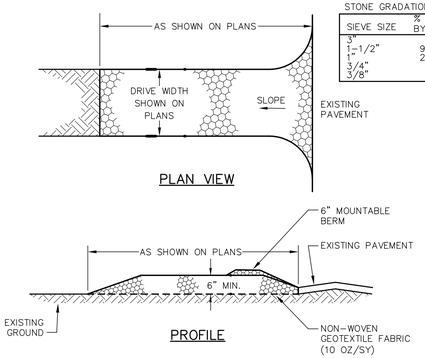
WILDLIFE PROTECTION NOTES

1. ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES ON THE PROJECT SITE SHALL BE REPORTED IMMEDIATELY TO THE NHF&G NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603–271–2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV, WITH THE EMAIL SUBJECT LINE CONTAINING THE NHB DATACHECK TOOL RESULTS LETTER ASSIGNED NUMBER, THE PROJECT NAME, AND THE TERM WILDLIFE SPECIES OBSERVATION.

2. PHOTOGRAPHS OF THE OBSERVED SPECIES AND NEARBY ELEMENTS OF HABITAT OR AREAS OF LAND DISTURBANCE SHALL BE PROVIDED TO NHF&G IN DIGITAL FORMAT AT THE ABOVE EMAIL ADDRESS FOR VERIFICATION, AS FEASIBLE.

3. IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHF&G AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHF&G, IF ANY, TO ASSURE THE PROJECT DOES NOT APPRECIABLY JEOPARDIZE THE CONTINUED EXISTENCE OF THREATENED AND ENDANGERED SPECIES AS DEFINED IN FIS 1002.04.

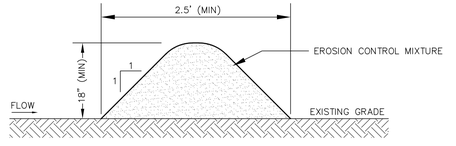
4. THE NHF&G, INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – NHDOT STANDARD STONE SIZE #4 – SECTION 703 OF NHDOT STANDARD.
2. LENGTH – DETAILED ON PLANS (50 FOOT MINIMUM).
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. WIDTH – FULL DRIVE WIDTH UNLESS OTHERWISE SPECIFIED.
5. FILTER FABRIC – MIRAFI 600X OR EQUAL APPROVED BY ENGINEER.
6. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AT ALL ENTRANCES TO PUBLIC RIGHTS–OF–WAY, AT LOCATIONS SHOWN ON THE PLANS, AND/OR WHERE AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION EXIT — NOT TO SCALE



NOTES

1. ORGANIC FILTER BERMS MAY BE UTILIZED IN LIEU OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. THE EROSION CONTROL MIXTURE USED IN FILTER BERMS SHALL BE A WELL–GRADED MIX OF PARTICLE SIZES THAT MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER, STUMP GRINDINGS, SHREDDED OR COMPOSTED BARK, AND/OR ACCEPTABLE MANUFACTURED PRODUCTS AND SHALL BE FREE OF REFUSE, PHYSICAL CONTAMINANTS AND MATERIAL TOXIC TO PLANT GROWTH. EROSION CONTROL MIXTURE SHALL MEET THE FOLLOWING STANDARDS:
   a) THE ORGANIC CONTENT SHALL BE 80–100% OF DRY WEIGHT.
   b) PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN, AND 70–85% PASSING A 0.75" SCREEN.
   c) THE ORGANIC PORTION SHALL BE FIBROUS AND ELONGATED.
   d) LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS SHALL NOT BE INCLUDED IN THE MIXTURE.
   e) SOLUBLE SALTS CONTENT SHALL BE >4.0mmhos/cm.
   f) THE pH SHALL BE BETWEEN 5.0 AND 8.0.
3. ORGANIC FILTER BERMS SHALL BE INSTALLED ALONG A RELATIVELY LEVEL CONTOUR. IT MAY BE NECESSARY TO CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BERM.
4. ON SLOPES LESS THAN 5%, OR AT THE BOTTOM OF SLOPES NO STEEPER THAN 3:1 AND UP TO 20' LONG, THE BERM SHALL BE A MINIMUM OF 12" HIGH (AS MEASURED ON THE UPHILL SIDE) AND A MINIMUM OF 36" WIDE. ON LONGER AND/OR STEEPER SLOPES, THE BERM SHALL BE TALLER AND WIDER TO ACCOMMODATE THE POTENTIAL FOR ADDITIONAL RUNOFF (MAXIMUM HEIGHT SHALL NOT EXCEED 2').
5. FROZEN GROUND, OUTCROPS OF BEDROCK, AND VERY ROOTED FORESTED AREAS PRESENT THE MOST PRACTICAL AND EFFECTIVE LOCATIONS FOR ORGANIC FILTER BERMS. OTHER BMP'S SHOULD BE USED AT LOW POINTS OF CONCENTRATED RUNOFF, BELOW CULVERT OUTLET APRONS, AROUND CATCH BASINS, AND AT THE BOTTOM OF STEEP PERIMETER SLOPES THAT HAVE A LARGE CONTRIBUTING AREA.
6. SEDIMENT SHALL BE REMOVED FROM BEHIND THE FILTER BERMS WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE BERM.
7. ORGANIC FILTER BERMS MAY BE LEFT IN PLACE ONCE THE SITE IS STABILIZED PROVIDED ANY SEDIMENT DEPOSITS TRAPPED BY THEM ARE REMOVED AND DISPOSED OF PROPERLY.
8. FILTER BERMS ARE PROHIBITED AT THE BASE OF SLOPES STEEPER THAN 8% OR WHERE THERE IS FLOWING WATER WITHOUT THE SUPPORT OF ADDITIONAL MEASURES SUCH AS SILTFENCE.

ORGANIC FILTER BERM — NOT TO SCALE

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED
PROFESSIONAL ENGINEER
7/26/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 26, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EBS	05/31/22
1	PER REVIEW COMMENTS	EBS	07/26/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 4839–SITE.dwg

SCALE: AS SHOWN

OWNER:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

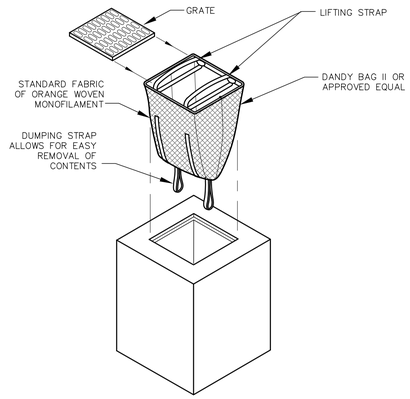
APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
DETAIL SHEET

SHEET NUMBER:
C - 7

P4839



INSTALLATION AND MAINTENANCE:

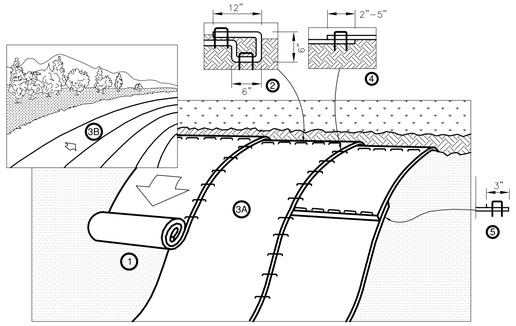
INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD;

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

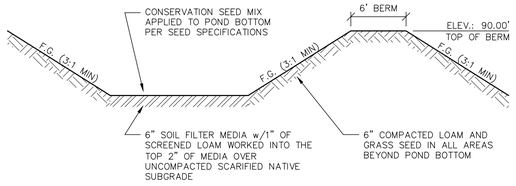
STORM DRAIN INLET PROTECTION NOT TO SCALE



NOTES

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"–5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

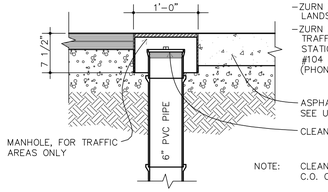
EROSION CONTROL BLANKET - SLOPE NOT TO SCALE



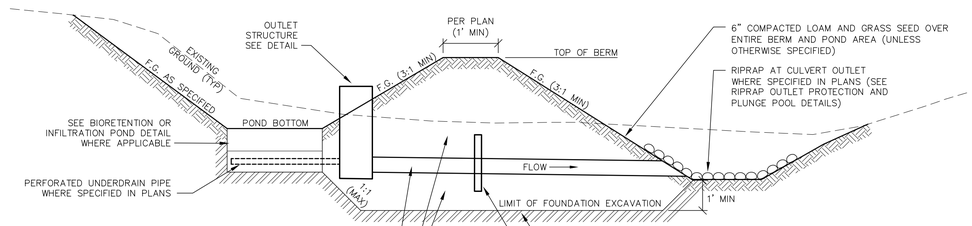
NOTES

1. SOIL FILTER MEDIA SHALL BE AS SPECIFIED FOR BIOFILTRATION PONDS, SEE DETAIL.
2. DO NOT PLACE INFILTRATION POND INTO SERVICE UNTIL ITS SIDE SLOPES AND CONTRIBUTING AREAS HAVE BEEN STABILIZED.
3. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES TO THE INFILTRATION POND DURING ANY STAGE OF CONSTRUCTION.
4. DO NOT TRAFFIC EXPOSED SURFACES OF INFILTRATION POND WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION ACTIVITIES WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE BASIN.
5. POND BERMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STORMWATER POND BERM DETAIL.

INFILTRATION POND #3 NOT TO SCALE



CLEANOUT DETAIL NOT TO SCALE



GRANULAR FILL GRADATION	
Sieve size	Embankment Material % Passing sieve
4	90–100%
40	50–80%
100	29–43%
200	15–30%

Construction Criteria

1. Foundation Preparation –– The foundation shall be cleared of trees, logs, stumps, roots, brush, boulders, sod, and rubbish. If suitable for reuse, the topsoil and sod shall be stockpiled and spread on the completed embankment and spillways. Foundation surfaces shall be sloped no steeper than 1:1. The foundation area shall be thoroughly scarified before placement of fill material. The surface shall have moisture added and/or it shall be compacted if necessary so that the first layer of fill can be bonded to the foundation.

   The cutoff trench and any other required excavations shall be dug to the lines and grades shown on the plans or as staked in the field. If they are suitable, excavated materials shall be used in the permanent fill.

   Existing stream channels in the foundation area shall be sloped no steeper than 1:1 and deepened and widened as necessary to remove all stones, gravel, sand, stumps, roots, and other objectionable material and to accommodate compaction equipment.

   Foundation areas shall be kept free of standing water when fill is being placed on them.

2. Granular Fill Placement –– The material placed in the fill shall be free of sod, roots, frozen soil, stones more than 4 inches in diameter and other objectionable material.

   Selected backfill material shall be placed around structures, pipe conduits, and drainage diaphragm at about the same rate on all sides to prevent damage from unequal loading.

   The placing and spreading of fill material shall be started at the lowest point of the foundation and the fill brought up in horizontal layers of such thickness that the required compaction can be obtained. The fill shall be constructed in 8" continuous horizontal layers except where openings or sectionalized fills are required. In those cases, the slope of the bonding surfaces between the embankment in place and the embankment to be placed shall not be steeper than 3 horizontal to 1 vertical. The bonding surface shall be treated the same as that specified for the foundation so as to insure a good bond with the new fill.

   The distribution and gradation of materials shall be such that no lenses, pockets, streaks, or layers of material differ substantially in texture of gradation from the surrounding material. If it is necessary to use materials of varying texture and gradation, the more impervious material shall be placed in the center and upstream parts of the fill. If zoned fills of substantially differing materials are specified, the zones shall be placed according to the lines and grades shown on the drawings. The complete work shall conform to the lines, grades, and elevations shown on the drawings or as staked in the field.

3. Moisture Control –– The moisture content of the fill material shall be adequate for obtaining the required compaction. Material that is too wet shall be dried to meet this requirement, and material that is too dry shall have water added and mixed until the requirement is met.

4. Compaction –– Construction equipment shall be operated over the areas of each layer of fill to insure that the required compaction is obtained. Special equipment shall be used if needed to obtain the required compaction.

   Fill material shall be compacted to not less than 95% of AASHTO T99 Method C compaction method.

   Fill adjacent to structures, pipe conduits, and drainage diaphragm shall be compacted to a density equivalent to that of the surrounding fill by means of hand tamping or manually directed power tamper or plate vibrators. Fill adjacent to concrete structures shall not be compacted until the concrete is strong enough to support the load.

5. Protection –– A protective cover of vegetation shall be established on all exposed surfaces of the embankment, spillway, and borrow area in accordance with the plans. If soil or climatic conditions preclude the use of vegetation and protection is needed, non–vegetative means, such as mulches or gravel, may be used. In some places, temporary vegetation may be used until conditions permit establishment of permanent vegetation.

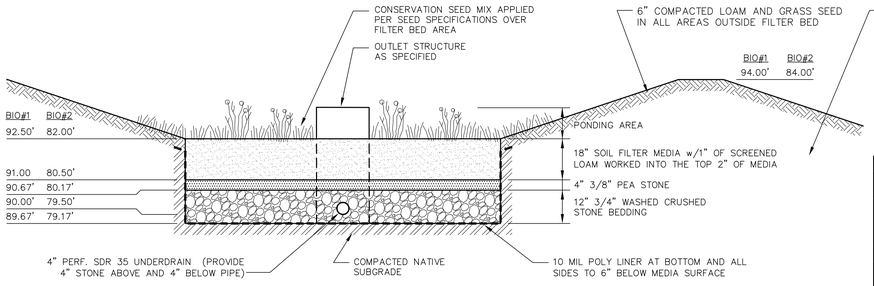
Maintenance

Maintenance is necessary if detention/retention basins are to continue to function as originally designed. A local government, a designated group such as a homeowners' association, or an individual must be assigned responsibility for maintaining the structures and the basin area. A maintenance plan should be developed that outlines the maintenance operations and a schedule for carrying out the procedures.

The following should be considered in formulating a maintenance plan:

1. Embankment –– The embankment should be inspected annually to determine if rodent burrows, wet areas, or erosion of the fill is taking place.
2. Vegetation –– The vegetated areas of the structure should be protected from damage by fire, grazing, traffic, and dense weed growth. Lime and fertilizer should be applied as necessary as determined by soil tests. Trees and shrubs should be kept off the embankment and emergency spillway areas.
3. Inlets –– Pipe inlets and spillway structures should be inspected annually and after every major storm. Accumulated debris and sediment should be removed.
4. Outlets –– Pipe outlets should be inspected annually and after every major storm. The condition of the pipes should be noted and repairs made as necessary. If erosion is taking place, then measures should be taken to stabilize and protect the affected area.
5. Sediment –– Sediment should be continually checked in the basin. When sediment accumulations reach the predetermined design elevation, then the sediment should be removed and properly disposed of.
6. Safety Inspections –– All permanent impoundments should be inspected by a qualified professional engineer on a periodic basis. If there is potential for significant damage or loss of life downstream, then the inspection should be carried out annually.

STORMWATER POND BERM DETAIL NOT TO SCALE



BERM GRANULAR FILL GRADATION	
Sieve size	Embankment Material % Passing sieve
4	90 – 100%
40	50 – 80%
100	29 – 43%
200	15 – 30%
CRUSHED STONE BEDDING *	
Sieve size	% Passing by weight
1"	100%
3/4"	90 – 100%
3/8'	20 – 55%
#4	0 – 10%
#8	0 – 5%

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 NHDOT STANDARD SPECIFICATIONS

FILTER MEDIA MIXTURES			
Component Material	Percent of Mixture by Volume	Gradation of material	
		Sieve No.	Percent by Weight Passing Standard Sieve
Filter Media Option A			
ASTM C–33 concrete sand	50 – 55%		
Loamy sand topsoil, with fines as indicated	20 – 30%	200	15 to 25%
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 – 30%	200	< 5%
Filter Media Option B			
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 – 30%	200	< 5%
Loamy coarse sand	70 – 80%	10	85 – 100%
		20	70 – 100%
		60	15 – 40%
		200	8 – 15%

NOTES

1. WHEN CONTRACTOR EXCAVATES BIORETENTION POND AREA TO SUBGRADE, DESIGN ENGINEER SHALL PERFORM SUBSURFACE EVALUATION PRIOR TO THE PLACEMENT OF ANY SELECT MATERIAL OR OTHER BACKFILL.
2. SOIL FILTER MEDIA SHALL EITHER OPTION A OR OPTION B AT CONTRACTOR'S DISCRETION.
3. DO NOT PLACE BIORETENTION POND INTO SERVICE UNTIL ITS SIDE SLOPES AND CONTRIBUTING AREAS HAVE BEEN STABILIZED.
4. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES TO THE BIORETENTION POND DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SURFACES OF BIORETENTION POND WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION ACTIVITIES WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE BASIN.
6. POND BERMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STORMWATER POND BERM DETAIL.

MAINTENANCE REQUIREMENTS

- SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EXCEEDING 2.5 INCHES IN A 24–HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS A WARRANTED BY SUCH INSPECTION.
- PRETREATMENT MEASURES SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
- AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72–HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
- VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING, WEED WHACKING, REMOVAL, AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES. BERM AREAS ARE TO BE MOWED TWICE ANNUALLY.

DESIGN REFERENCES

- UNH STORMWATER CENTER
- EPA (1999A)
- NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 2, DECEMBER 2008 AS AMENDED.

BIORETENTION POND (BIO #'S 1 AND 2) NOT TO SCALE

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED PROFESSIONAL ENGINEER
5/31/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: MAY 31, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EBS	05/31/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 4839–SITE.dwg

SCALE: AS SHOWN

OWNER:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

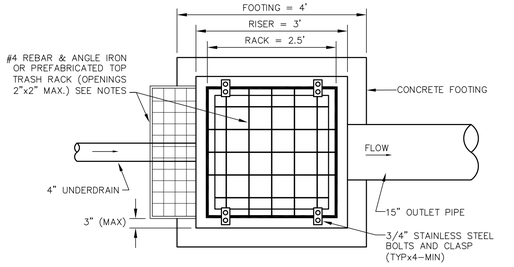
APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

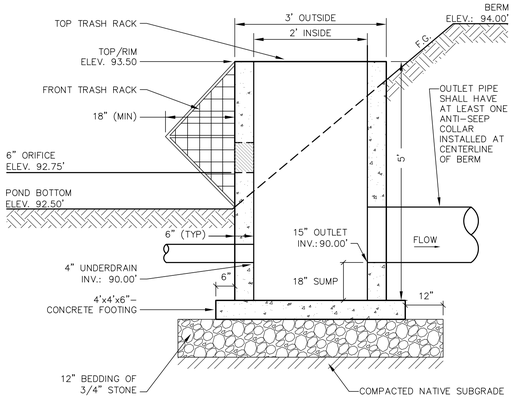
PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
DETAIL SHEET

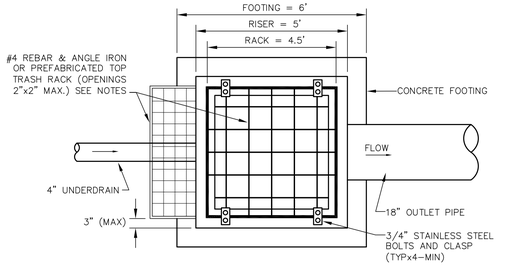
SHEET NUMBER:
C - 8

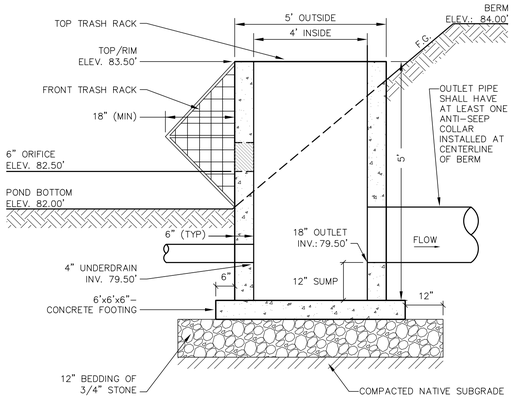
P4839



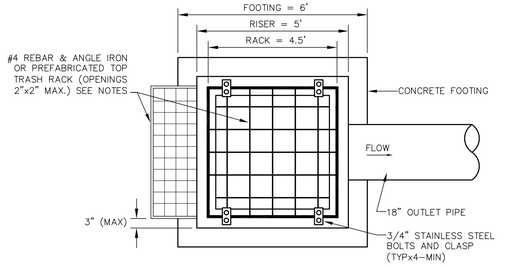


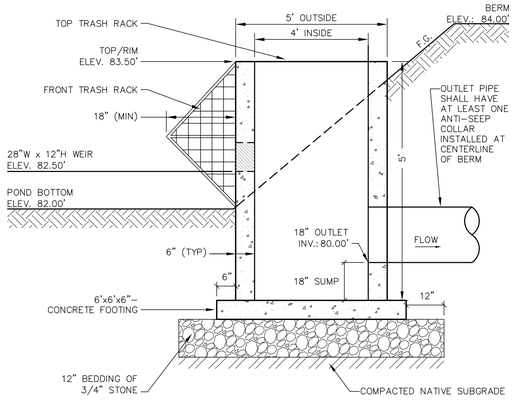
POND OUTLET #2 (2' STRUCTURE) NOT TO SCALE



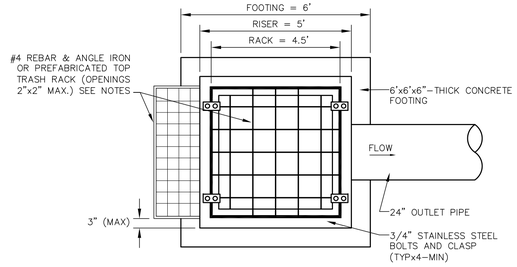


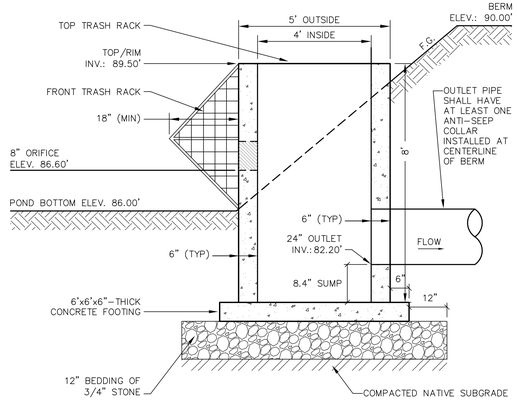
POND OUTLET #7 (4' STRUCTURE) NOT TO SCALE



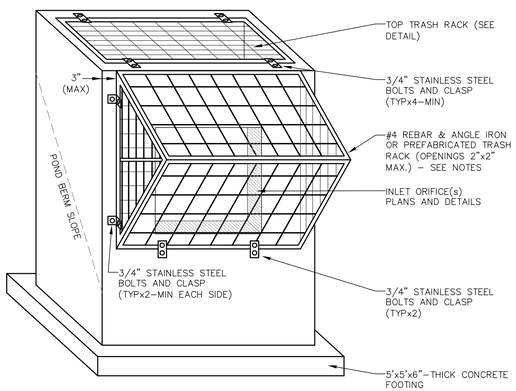


POND OUTLET #11 (4' STRUCTURE) NOT TO SCALE





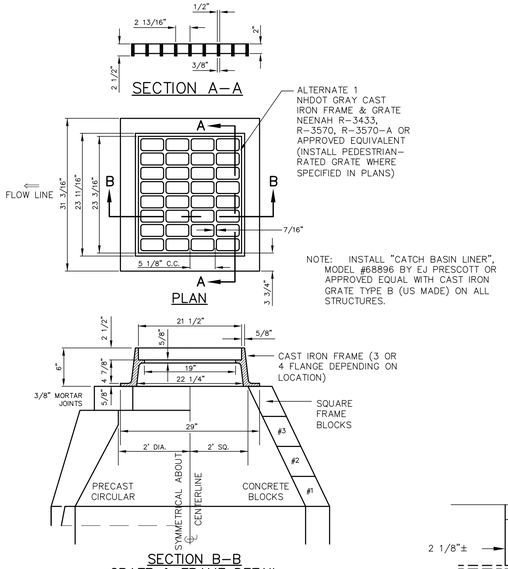
POND OUTLET #14 (4' STRUCTURE) NOT TO SCALE



CONSTRUCTION SPECIFICATIONS

1. OUTLET STRUCTURE SHALL BE CONSTRUCTED OF STEEL REINFORCED CONCRETE FABRICATED ONSITE OR PRECAST TO EQUAL DIMENSIONS AND REINFORCING.
2. CONCRETE FOOTING TO BE CONSTRUCTED INTEGRAL WITH BASE. IF CONSTRUCTED SEPARATELY, FOOTING SHALL HAVE A CONTINUOUS KEYWAY INSTALLED AND REBAR CAST INTO IT THAT SHALL EXTEND ABOVE THE SLAB A MINIMUM OF 8" FOR CONNECTION TO THE BOX AND ANY REINFORCING.
3. ALL JOINTS AND PIPE OPENINGS SHALL BE SEALED WATERTIGHT WITH MORTAR.
4. ALL EXPOSED REBAR TO BE PAINTED WITH RUST-RESISTANT PAINT OR HOT-DIPPED GALVANIZED.
5. PRE-FABRICATED TRASH RACKS ARE ACCEPTABLE UPON WRITTEN ACCEPTANCE BY THE ENGINEER.
6. STRUCTURE IS TO BE BUILT TO WITHSTAND H20 LOADING.
7. NATIVE IN SITU SOILS UNDERLYING THE STRUCTURE'S STONE BASE PAD AND THE PAD ITSELF ARE TO BE COMPACTED PRIOR TO INSTALLING STRUCTURE.
8. ALL CONCRETE SHALL BE 4,000 PSI MINIMUM.
9. STAINLESS STEEL BOLTS FOR TRASH RACK TO BE INSTALLED WITH HILTI AND EPOXY OR CAST IN.
10. EXTERIOR TRASH RACK DIMENSIONS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TRASH RACKS THAT ALLOW FULL SCREENING PROTECTION TO EVERY INLET ORIFICE AND THE TOP OF THE STRUCTURE. THIS MAY REQUIRE CUSTOM FABRICATION AND/OR ALTERNATE METHODS TO CONNECT THE RACKS TO THE OUTLET STRUCTURE.

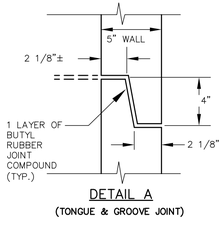
POND OUTLET STRUCTURE (TYPICAL) NOT TO SCALE

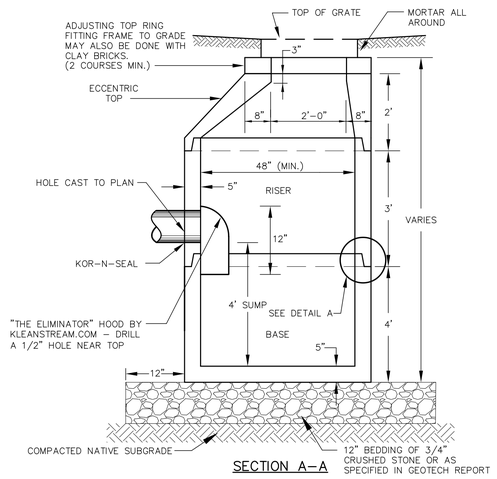


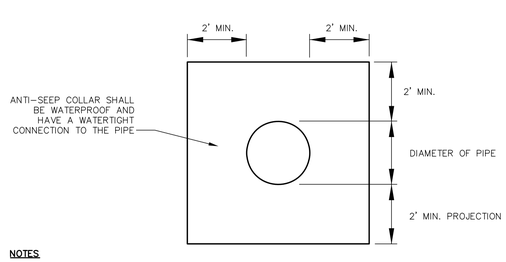
NOTES

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4' OF FINISH GRADE.
7. FRAME AND GRATE DIMENSIONS ARE TYPICAL BUT MAY VARY BASED ON PRODUCT SELECTED OR EQUIVALENT APRROVED BY THE ENGINEER.

DEEP SUMP CATCH BASIN (CB) NOT TO SCALE







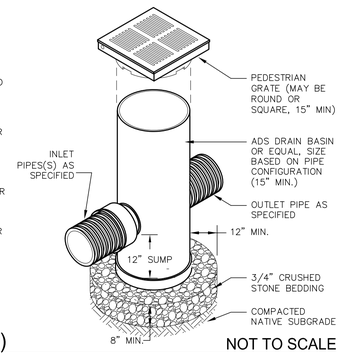
NOTES

ANTI-SEEP COLLARS SHALL BE CLAY, CONCRETE, PLASTIC (AGRI-DRAIN), OR EQUAL APPROVED BY THE ENGINEER.

ANTI-SEEP COLLAR NOT TO SCALE

NOTES:

1. FRAMES AND GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN AND DETAILS.
3. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE, N-12HP AND PVC SEWER.
4. INLINE DRAIN TO BE PVC, DIAMETER AS SPECIFIED AND AS MANUFACTURED BY ADS OR APPROVED EQUAL.
5. THE CONTRACTOR SHALL INSTALL THE DRAIN BASIN PER THE MANUFACTURER'S RECOMMENDATIONS AND AS SHOWN ON THE DRAWINGS.
6. FOR INSTALLATION IN PEDESTRIAN AND LANDSCAPE AREAS ONLY.



YARD DRAIN (YD) NOT TO SCALE

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
7/26/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 26, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EBS	05/31/22
1	PER REVIEW COMMENTS	EBS	07/26/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 4839-SITE.dwg

SCALE: AS SHOWN

OWNER:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

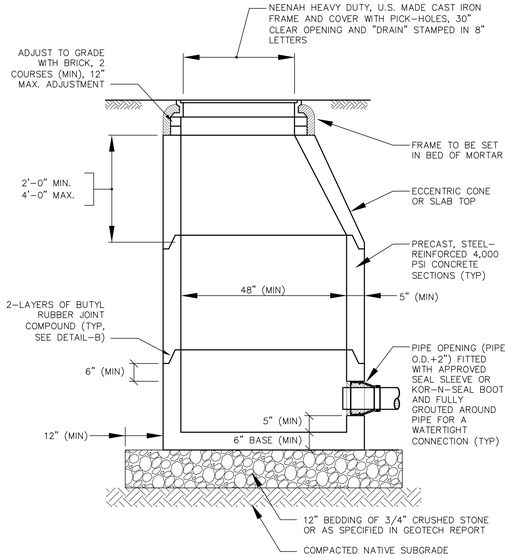
APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
DETAIL SHEET

SHEET NUMBER:
C - 9

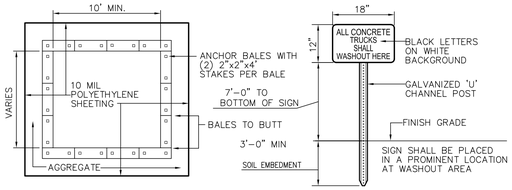
P4839

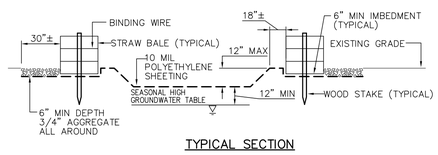


NOTES

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. ALL MANHOLE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H-20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4 FT OF GRADE.
7. MANHOLE STEPS ARE REQUIRED PER THE CITY OF DOVER.

DRAIN MANHOLE (DMH) NOT TO SCALE



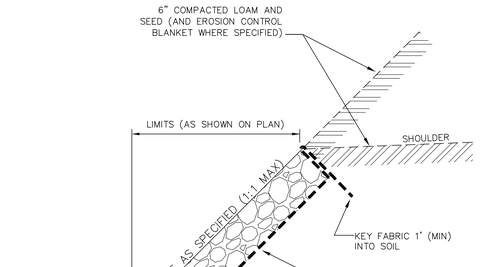


TYPICAL SECTION

NOTES

1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
4. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
6. AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

CONCRETE WASHOUT NOT TO SCALE



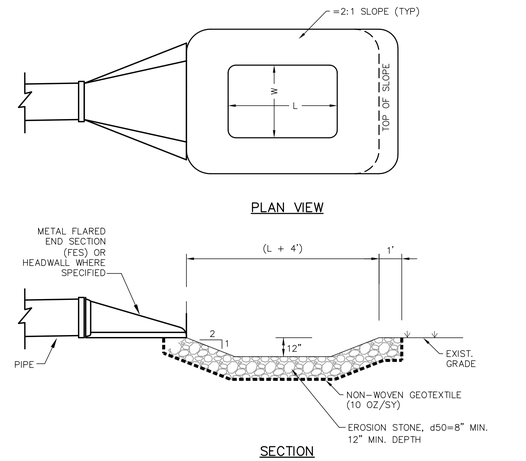
NOTES

1. CONSTRUCT RIP RAP LINED SLOPE TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. EROSION STONE USED FOR THE RIP RAP LINED SLOPE SHALL MEET THE FOLLOWING GRADATION:

SIZE	PERCENT PASSING BY WEIGHT
12"	100
6"	25-50

4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
5. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

RIPRAP STABILIZED SLOPE NOT TO SCALE



NOTES

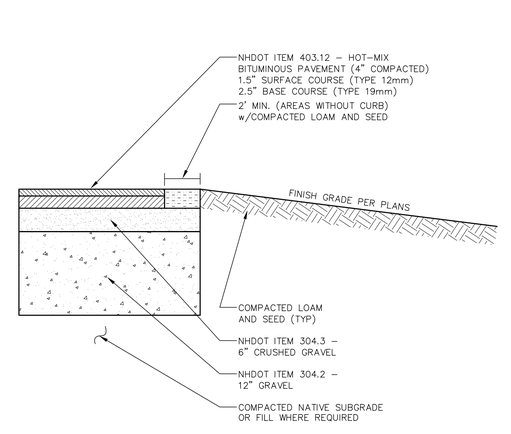
1. CONSTRUCT PLUNGE POOL TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. EROSION STONE USED FOR THE PLUNGE POOL SHALL MEET THE FOLLOWING GRADATION.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
5. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

PLUNGE POOL NOT TO SCALE

NOTES FOR STANDARD AND HEAVY DUTY ASPHALT PAVEMENT

1. PROJECT GEOTECHNICAL REPORT MAY REQUIRE A DIFFERENT PAVEMENT CROSS SECTION(S). THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING AND FOLLOWING ALL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT. IN THE EVENT THAT THE REPORT AND CIVIL PLANS DIFFER, THE MORE STRINGENT SPECIFICATION SHALL APPLY.
2. ALL EXISTING FILL, BURIED ORGANIC MATTER, CLAY, LOAM, MUCK, AND/OR OTHER QUESTIONABLE MATERIAL SHALL BE REMOVED FROM BELOW ALL PAVEMENT, SHOULDERS AND UNDERGROUND PIPING/UTILITIES TO DEPTHS RECOMMENDED IN GEOTECHNICAL REPORT.
3. SUBGRADE SHALL BE PROOFROLLED A MINIMUM OF 6 PASSES WITH A 10-TON VIBRATORY COMPACTOR OPERATING AT PEAK RATED FREQUENCY OR BY MEANS APPROVED BY THE ENGINEER.
4. FILL BELOW PAVEMENT GRADES SHALL BE GRANULAR BORROW COMPACTED PER DOT REQUIREMENTS.
5. SITEWORK CONTRACTOR SHALL COORDINATE GEOTECHNICAL ENGINEERING INSPECTIONS WITH THE CONSTRUCTION MANAGER PRIOR TO PLACING GRAVELS.
6. TACK COAT SHALL BE APPLIED BETWEEN SUCCESSIVE LIFTS OF ASPHALT.
7. THE BITUMINOUS PAVEMENT SHALL BE COMPACTED TO 95 PERCENT OF ITS THEORETICAL MAXIMUM DENSITY AS DETERMINED BY ASTM D-2041. THE BASE AND SUBBASE MATERIALS SHOULD BE COMPACTED TO AT LEAST 95 PERCENT OF THEIR MAXIMUM DRY DENSITIES AS DETERMINED BY ASTM D-1557.

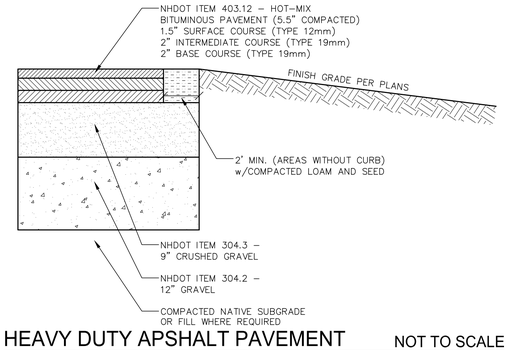
STANDARD DUTY ASPHALT PAVEMENT NOT TO SCALE



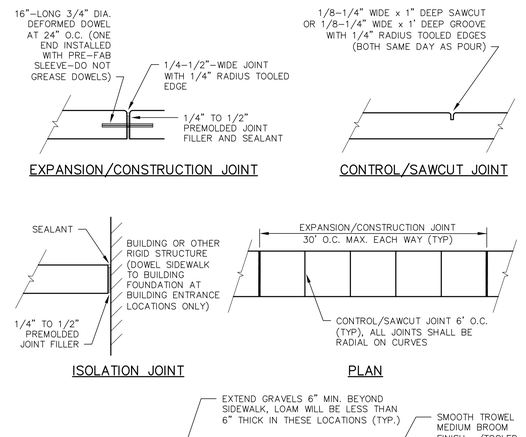
NOTES

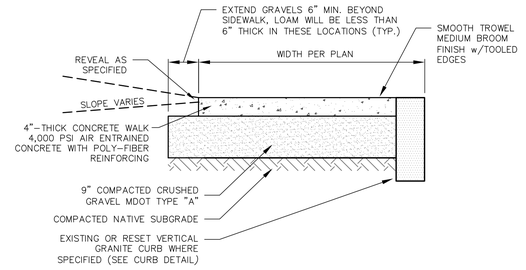
1. PROJECT GEOTECHNICAL REPORT MAY REQUIRE A DIFFERENT PAVEMENT CROSS SECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING AND FOLLOWING ALL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT. IN THE EVENT THAT THE REPORT AND CIVIL PLANS DIFFER, THE MORE STRINGENT SPECIFICATION SHALL APPLY.
2. ISOLATION JOINT TO BE INSTALLED IN ALL LOCATIONS WHERE PAD ABUTS ANY OTHER STRUCTURE OR PAVEMENT. ALL OTHER EXPANSION, ISOLATION AND CONTROL JOINTS TO BE INSTALLED PER THE RECOMMENDATIONS OF THE STRUCTURAL ENGINEER.

HEAVY-DUTY CONCRETE PAVEMENT NOT TO SCALE



HEAVY DUTY APSHALT PAVEMENT NOT TO SCALE





NOTE

1. JOINTS IN CONCRETE SIDEWALKS SHALL CONFORM TO THE TYPES AND LOCATIONS SHOWN IN THE HEAVY-DUTY CONCRETE PAVEMENT DETAIL.

CONCRETE SIDEWALK NOT TO SCALE

ALTUS ENGINEERING, INC.
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STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
7/26/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 26, 2022

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APPROVED BY: EBS
DRAWING FILE: 4839-SITE.dwg

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APPLICANT:
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PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

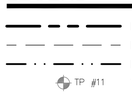
TITLE:
DETAIL SHEET

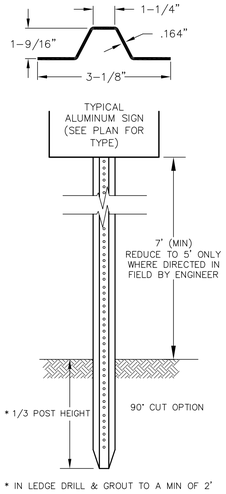
SHEET NUMBER: C - 10

P4839

LEGEND

- PROPERTY LINE
- BUILDING SETBACK
- EDGE OF WETLAND
- TP #11 — TESTPIT OR BORING LOCATION
- EXISTING/PROPOSED GRAVEL
- VGC SGC — EXISTING PAVEMENT/VERTICAL/SLOPED GRANITE CURB
- VGC/SGC/MCC DYL — PROP. PAVEMENT/VERTICAL/SLOPED GRANITE/CONCRETE CURB
- EXISTING/PROPOSED GUARDRAIL
- EXISTING/PROPOSED STOCKADE FENCE
- 60 — EXISTING CONTOUR
- 60 — PROPOSED CONTOUR
- x 100.00 — x 104.00T 100.00B — PROPOSED SPOT GRADE/TOP & BOTTOM OF WALL OR CURB
- PROPOSED RETAINING WALL
- W WV — EXISTING WATER/CURB STOP/VALVE/HYDRANT
- S — EXISTING SEWER/MANHOLE
- G GV — EXISTING GAS/VALVE
- OHW — UGU — EXIST. OVERHEAD/UNDERGROUND UTILITIES/POLE
- D — EXISTING DRAINAGE/CB/DMH
- W — PROPOSED THRUST BLOCK/CURB STOP/VALVE/HYDRANT
- PW — F — PROPOSED DOMESTIC/FIRE WATER SERVICE LINE
- S — PROPOSED SEWER/MANHOLE/CLEANOUT
- G — PROPOSED GAS OR PROPANE
- UGE — PROPOSED UNDERGROUND ELECTRIC
- PROPOSED DRAINAGE (HARD PIPE)/CB/YD/DCB/DMH/FES
- UD — PROPOSED DRAINAGE (PERFORATED PIPE)/CLEANOUT
- RD — PROPOSED DRAINAGE (ROOF DRAIN)
- CPP — FES 4% — HDWL — CORRUGATED PLASTIC PIPE/FLARED END SECTION/HEADWALL
- PROPOSED GROUND SLOPE/APPROX. GRADE/PLUNGE POOL
- SILTFENCE/SEDIMENT BARRIER/CONST. FENCE
- STABILIZED CONSTRUCTION EXIT
- PROPOSED LIMIT OF DISTURBANCE/TREE CLEARING
- 44 — 226 — PARKING COUNT PER ROW/FOR TOTAL SITE
- PROPOSED RIPRAP
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED BIORETENTION/INFILTRATION POND SURFACE





R1-1 (30")

WAYFINDING 1 20" x 30"

R7-8 12" x 18"

WAYFINDING 1 20" x 30"

R7-8P 18" x 9"

CUSTOM-1 18" x 9"

LENGTH: AS REQUIRED

WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)

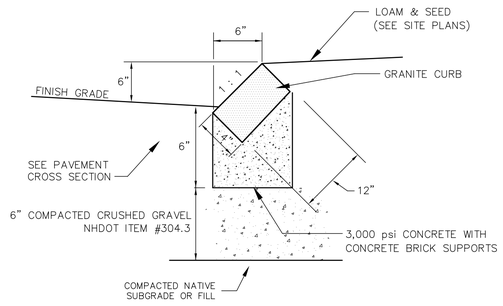
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH

STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)

NOTES

1. ALL SIGNS SHALL MEET THE REQUIREMENTS OF AND BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
2. WHEN PLACED PERPENDICULAR TO A TRAVELLED WAY OR SIDEWALK, SIGN EDGE SHALL BE NO CLOSER THAN 2' TO THE EDGE OF PAVEMENT. GREATER MINIMUM DISTANCE MAY BE REQUIRED IN CERTAIN LOCATIONS.

SIGN DETAILS — NOT TO SCALE

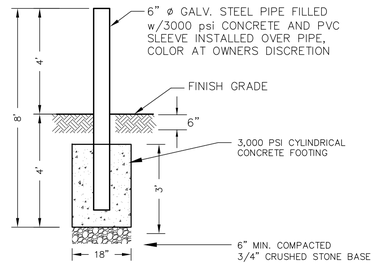


NOTES

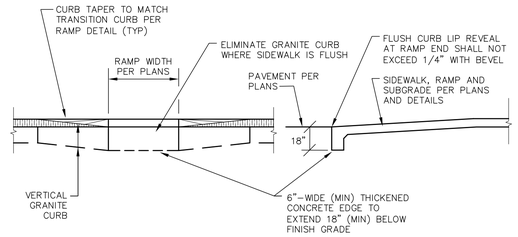
1. SEE SITE PLAN FOR LIMITS OF CURBING
2. ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES - SEE CHART

RADIUS FOR STONES WITH SQUARE JOINTS	MAXIMUM LENGTH
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
OVER 110'	8'

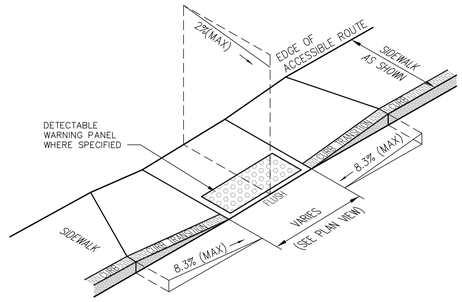
SLOPED GRANITE CURB — NOT TO SCALE



BOLLARD — NOT TO SCALE



FLUSH CURB AT RAMP DETAIL — NOT TO SCALE

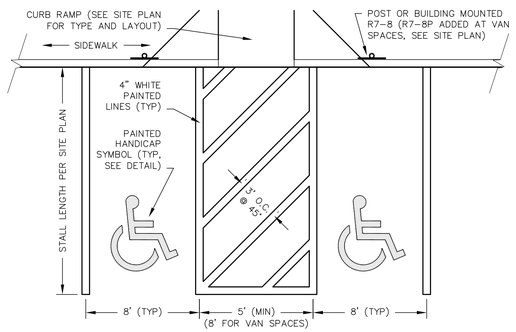


CURB RAMP (TYPE 'A') — NOT TO SCALE

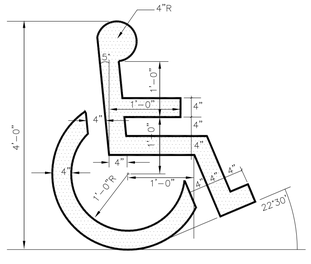
NOTES APPLICABLE TO ALL CURB RAMPS:

1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 2%.
2. THE MAXIMUM ALLOWABLE RUNNING SLOPE OF AN ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE RUNNING SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) CURB RAMP SHALL BE 8.3% FOR A MAXIMUM ELEVATION CHANGE OF 6".
4. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
5. BASE OF RAMP SHALL BE GRADED TO PREVENT THE PONDING OF WATER.
6. SEE CONCRETE SIDEWALK SECTION FOR RAMP CONSTRUCTION.
7. ALL CURB RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AMERICANS WITH DISABILITIES ACT (ADA), PROWAG R305.21 AND ALL APPLICABLE CODES.
8. FLUSH CURB SECTIONS SHALL HAVE A MAXIMUM LIP REVEAL OF 1/4" WITH A BEVEL AT THE EDGE OF PAVEMENT.
9. EDGES OF CONCRETE SIDEWALK FOOTINGS ALONG FLUSH CURBS SHALL BE HAUNCHED SO AS TO EXTEND TO A MINIMUM DEPTH OF 1' BELOW FINISH GRADE.
10. NO RAMP SHALL BE LESS THAN 4' IN WIDTH.
11. CURB RAMPS SHALL HAVE A FLAT 2% MAX LANDING AT THE TOP AND BOTTOM OF THE RAMPS WHEN THERE IS A CHANGE IN DIRECTION.

CURB RAMP NOTES — NOT TO SCALE



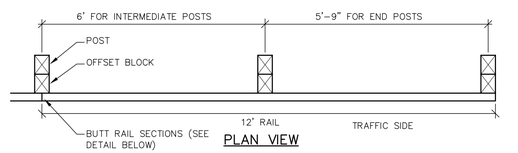
HANDICAP PARKING STALL LAYOUT — NOT TO SCALE



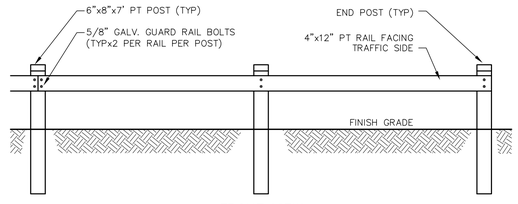
NOTES

1. SYMBOL TO BE PAINTED IN ALL HANDICAPPED ACCESSIBLE SPACES IN WHITE PAINT (BLUE-PAINTED SQUARE BACKGROUND AND WHITE BORDER OPTIONAL).

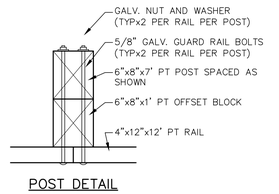
PAINTED HANDICAP SYMBOL — NOT TO SCALE



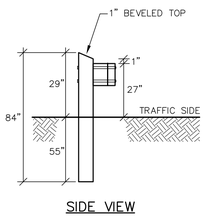
PLAN VIEW



FRONT VIEW



POST DETAIL

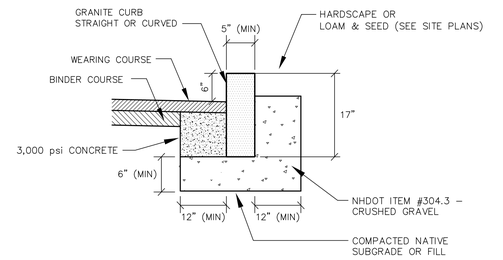


SIDE VIEW

NOTES

1. ALL POST AND RAIL MATERIAL SHALL BE PRESSURE TREATED (PT). PT POSTS SHALL BE RATED FOR GROUND CONTACT.
2. BOLT LENGTH IS DETERMINED BY 8" POST AND RAIL THICKNESS PLUS 1 INCH FOR NUT AND WASHER.
3. ALL MATERIAL TO MEET OR EXCEED NHDOT SECTION 606 - GUARDRAIL.

WOOD BEAM GUARDRAIL — NOT TO SCALE



NOTES:

1. SEE PLANS FOR CURB LOCATION.
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF CURB STONES = 3'
4. MAXIMUM LENGTH OF CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES - SEE CHART.
6. CURB ENDS TO ROUNDED AND BATTERED FACES TO BE CUT WHEN CALLED FOR ON THE PLANS.

RADIUS	MAX. LENGTH
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
OVER 60'	10'

VERTICAL GRANITE CURB — NOT TO SCALE

ALTUS ENGINEERING, INC.
133 Court Street, Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE — ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
7/26/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 26, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EBS	05/31/22
1	PER REVIEW COMMENTS	EBS	07/26/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 4839-SITE.dwg

SCALE: AS SHOWN

OWNER:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

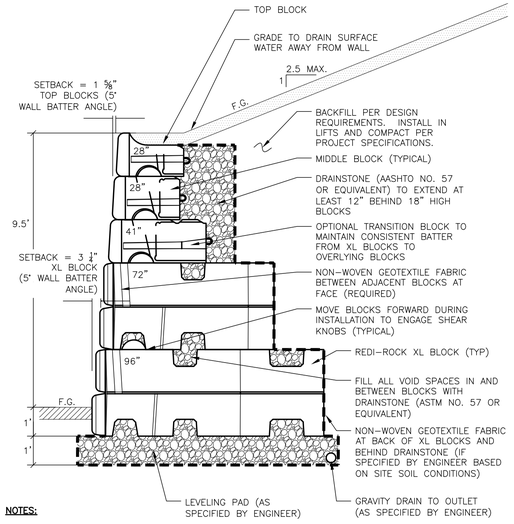
PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
DETAIL SHEET

SHEET NUMBER:
C - 11

P4839

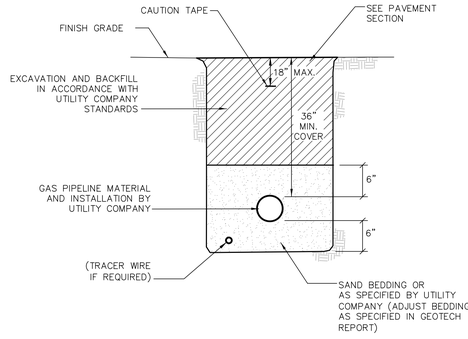
MODULAR BLOCK RETAINING WALL — NOT TO SCALE



NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY TEMPORARY SHORING, SHEETING AND/OR BRACING OF EXCAVATION WALLS AGAINST PROPERTY LINES OR OTHER AREAS THAT ARE NOT TO BE UNDERMINED.
2. WALL SHALL BE REDI-ROCK OR APPROVED EQUAL.
3. NO RETAINING WALL WORK SHALL EXTEND BEYOND THE LIMITS OF THE PROJECT SITE.
4. THIS DRAWING IS FOR REFERENCE ONLY. FINAL PROJECT DESIGNS, INCLUDING ALL CONSTRUCTION DETAILS, SHALL BE PREPARED BY A NH LICENSED PROFESSIONAL STRUCTURAL ENGINEER USING THE ACTUAL CONDITIONS OF THE PROPOSED SITE. FINAL WALL DESIGN MUST ADDRESS BOTH INTERNAL AND EXTERNAL DRAINAGE AND ALL MODES OF WALL STABILITY.
5. FINAL WALL DESIGN PLANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

GAS TRENCH — NOT TO SCALE



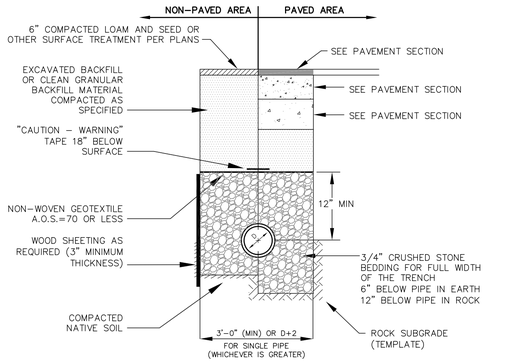
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY AND PROVIDE ALL EXCAVATION, COMPACTION AND BACKFILL REQUIRED FOR PIPE INSTALLATION.
2. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

SEWER TRENCH — NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. INSULATE GRAVITY SEWER AND FORCEMAINS WHERE THERE IS LESS THAN 5'–0" OF COVER WITH 2" THICK CLOSED CELL RIGID BOARD INSULATION, 18" ON EACH SIDE OF PIPE.
3. MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

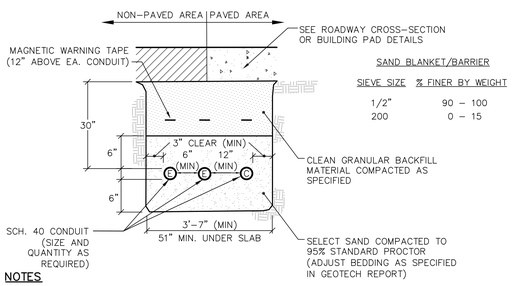
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

STANDARD TRENCH NOTES

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN ON THE DRAWING.
2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1–1/2 INCH TO 1/2 INCH SHALL BE USED.
3. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. BLANKET MAY BE REPLACED WITH BEDDING MATERIAL FOR CAST–IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE AND THE GEOTEXTILE IS RELOCATED ACCORDINGLY.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT, OR CLAY, ALL EXCAVATED LEDGE MATERIAL, ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION, AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION. IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT ONLY IF SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION WILL BE PRESERVED.
5. BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES – DIVISIONS 300 AND 400 RESPECTIVELY.
6. SHEETING, IF REQUIRED: WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID–DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION 1 FOOT ABOVE THE TOP OF PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAT 1 FOOT ABOVE THE TOP OF THE PIPE.
7. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL, FILL AND/OR LOAM SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DOT STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000#) CONCRETE AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG
   CEMENT MAXIMUM SIZE OF AGGREGATE: 1 INCH
   CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
10. CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
11. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO CITY STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.
12. THE CONTRACTOR SHALL INSTALL TRENCH DAMS IN ACCORDANCE WITH NHDES REGULATIONS.
13. SEWER TRENCHES SHALL BE CONSTRUCRTED IN ACCORANCE WITH NHDES STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWAGE AND WASTEWATER FACILITES, LATEST EDITION.

ELECTRIC / COMMUNICATION TRENCH — NOT TO SCALE



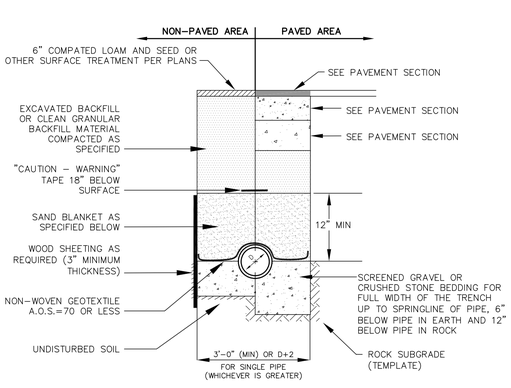
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. ALL CONDUIT IS TO BE SCHEDULE 40 PVC, ELECTRICAL GRADE, GRAY IN COLOR AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. A 10–FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE SERVICE PROVIDER DESIGNER, THE SWEEP–PVC JOINT IS NOT SUBJECT TO FAILURE DURING PULLING OF THE CABLE. ALL JOINTS ARE TO BE WATERTIGHT.
2. ALL 90 DEGREE SWEEPS WILL BE MADE WITH RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES.
3. BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY SERVICE PROVIDER. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE IN 6–INCH LAYERS AND THOROUGHLY COMPACTED.
4. A SUITABLE PULLING STRING, CAPABLE OF 300 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE SERVICE PROVIDER IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT. A MINIMUM OF TWENTY–FOUR (24") INCHES OF ROPE SLACK SHALL REMAIN AT THE END OF EACH DUCT. PULL ROPE SHALL BE INSTALLED IN ALL CONDUIT FOR FUTURE PULLS. PULL ROPE SHALL BE NYLON ROPE HAVING A MINIMUM TENSILE STRENGTH OF THREE HUNDRED (300#) LBS.
5. SERVICE PROVIDER SHALL BE GIVEN THE OPPORTUNITY TO INSPECT ALL CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD SERVICE PROVIDER BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. TYPICAL CONDUIT SIZES ARE 3–INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4–INCH FOR THREE PHASE SECONDARY, AND 5–INCH FOR THREE PHASE PRIMARY. HOWEVER, SERVICE PROVIDERS MAY REQUIRE DIFFERENT NUMBERS, TYPES AND SIZES OF CONDUIT THAN THOSE SHOWN HERE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL CONDUIT SIZES, TYPES AND NUMBERS WITH EACH SERVICE PROVIDER PRIOR TO ORDERING THEM.
7. ROUTING OF CONDUIT, LOCATION OF MANHOLES, TRANSFORMERS, CABINETS, HANDHOLES, ETC., SHALL BE DETERMINED BY SERVICE PROVIDER DESIGN PERSONNEL. THE CONTRACTOR SHALL COORDINATE WITH ALL SERVICE PROVIDERS PRIOR TO THE INSTALLATION OF ANY CONDUIT.
8. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE. WHERE REQUIRED BY UTILITY PROVIDER, CONDUIT SHALL BE SUPPORTED IN PLACE USING PIPE STANCHIONS PLACED EVERY FIVE (5') FEET ALONG THE CONDUIT RUN.
9. UNDER A BUILDING SLAB THE CONDUIT SHALL BE ENCASED IN 8" OF CONCRETE ON ALL SIDES.
10. ALL CONDUIT TERMINATIONS SHALL BE CAPPED TO PREVENT DEBRIS FROM ENTERING CONDUIT.

DRAINAGE TRENCH — NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. INSULATE GRAVITY SEWER AND FORCEMAINS WHERE THERE IS LESS THAN 5'–0" OF COVER WITH 2" THICK CLOSED CELL RIGID BOARD INSULATION, 18" ON EACH SIDE OF PIPE.
3. MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

SAND BLANKET/BARRIER

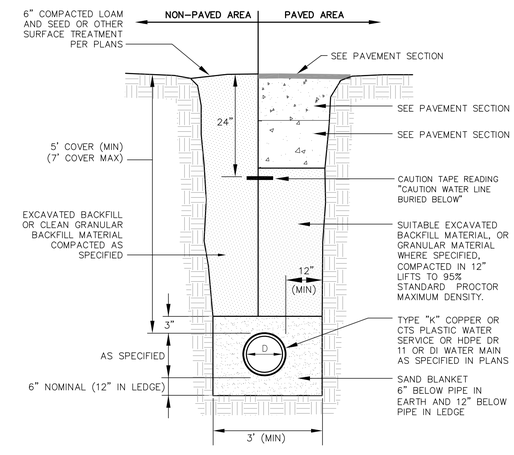
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

WATER MAIN TRENCH — NOT TO SCALE



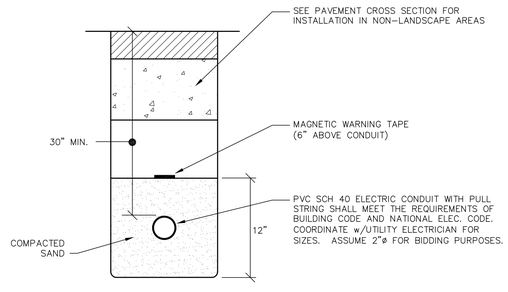
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. ALL TRENCHING AND BACKFILL SHALL CONFORM WITH THE STANDARDS OF EXETER DPW.

LIGHTING TRENCH SECTION — NOT TO SCALE



SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. CONTRACTOR TO COORDINATE WITH MEP PLANS AND ELECTRICIAN AND PROVIDE ALL EXCAVATION, COMPACTION AND BACKFILL REQUIRED FOR CONDUIT INSTALLATION.
2. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL ALL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

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www.altus-eng.com

STATE OF NEW HAMPSHIRE — ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER — 5/31/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: MAY 31, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EBS	05/31/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 4839–SITE.dwg

SCALE: AS SHOWN

OWNER:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

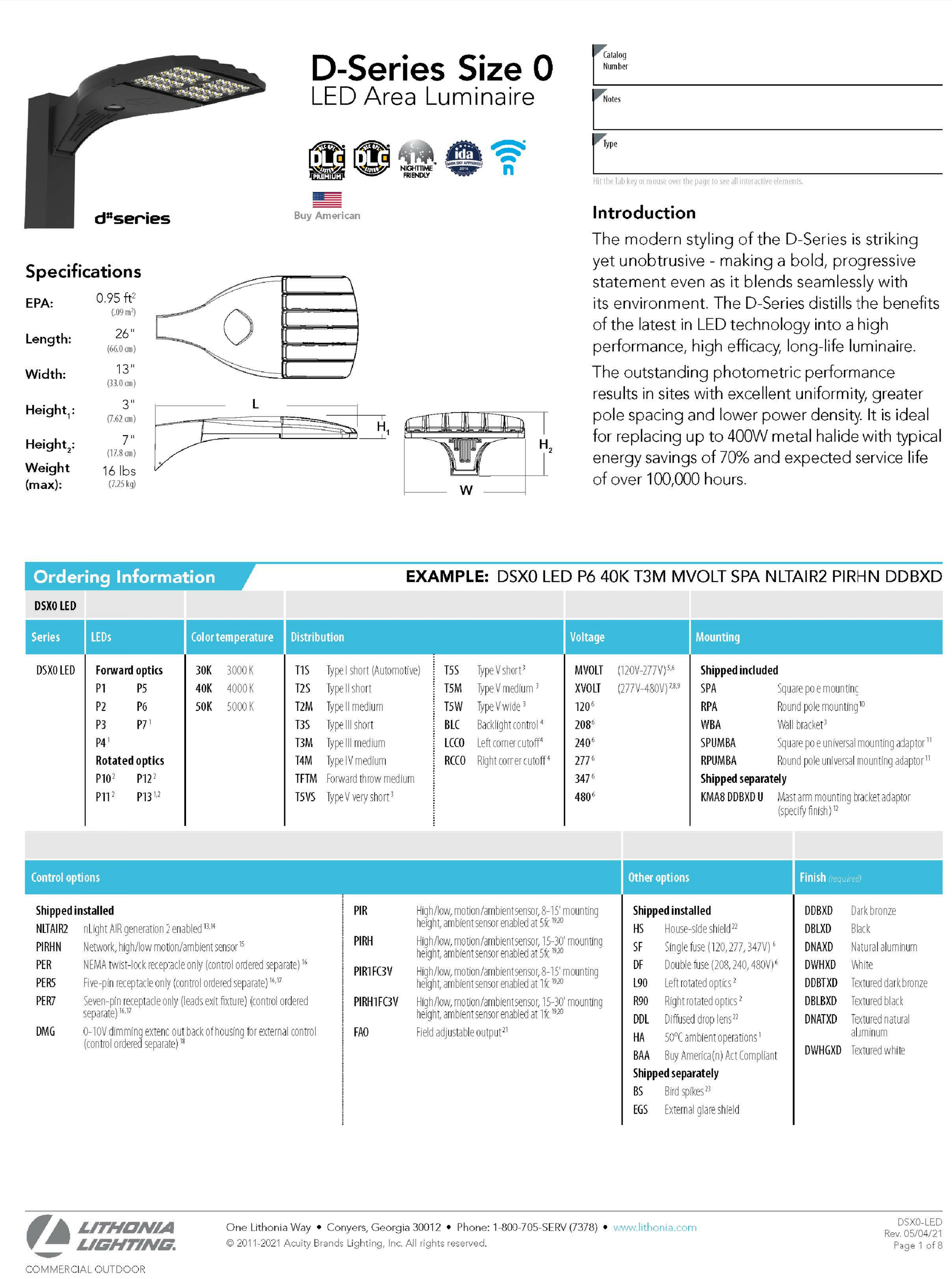
APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

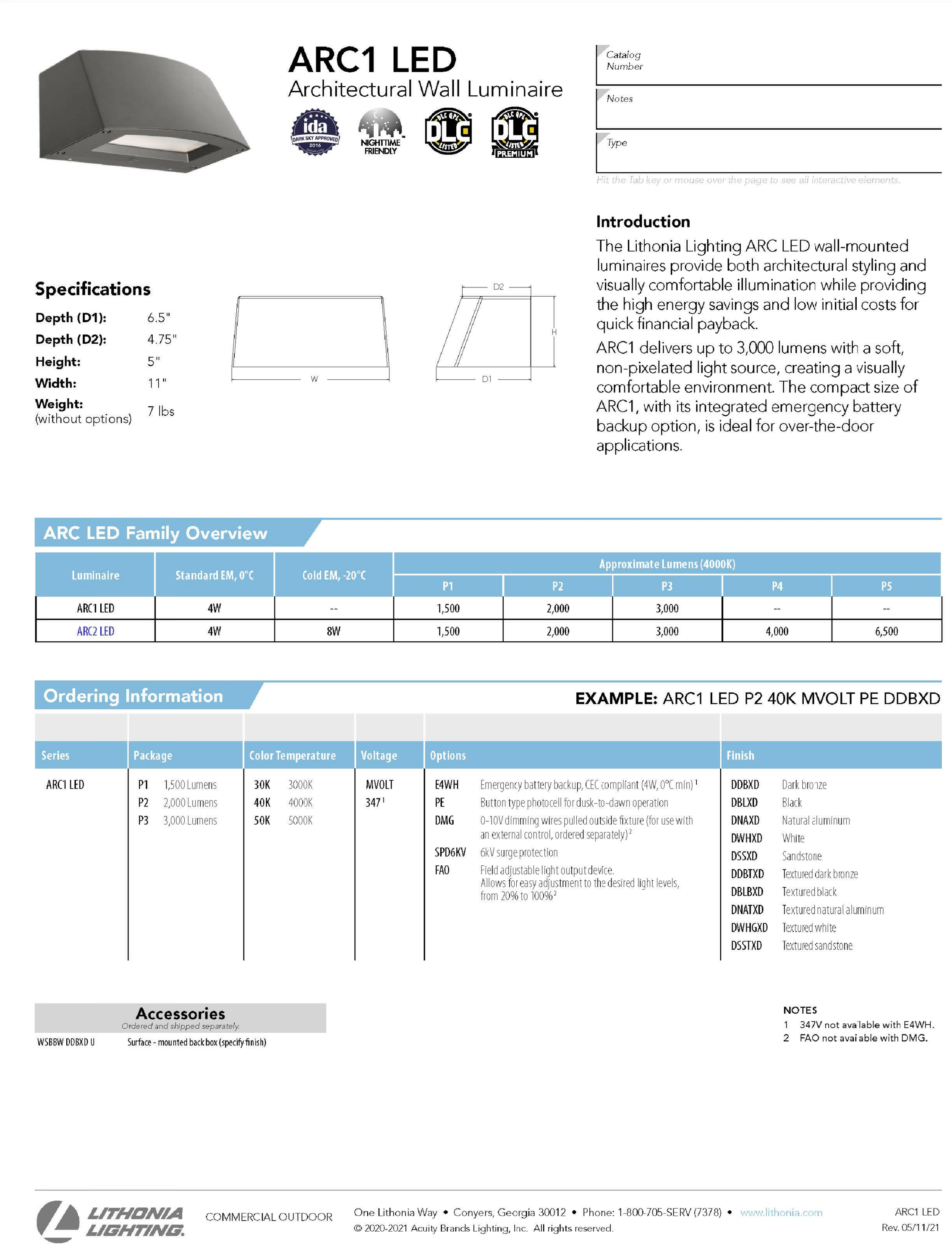
PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
DETAIL SHEET

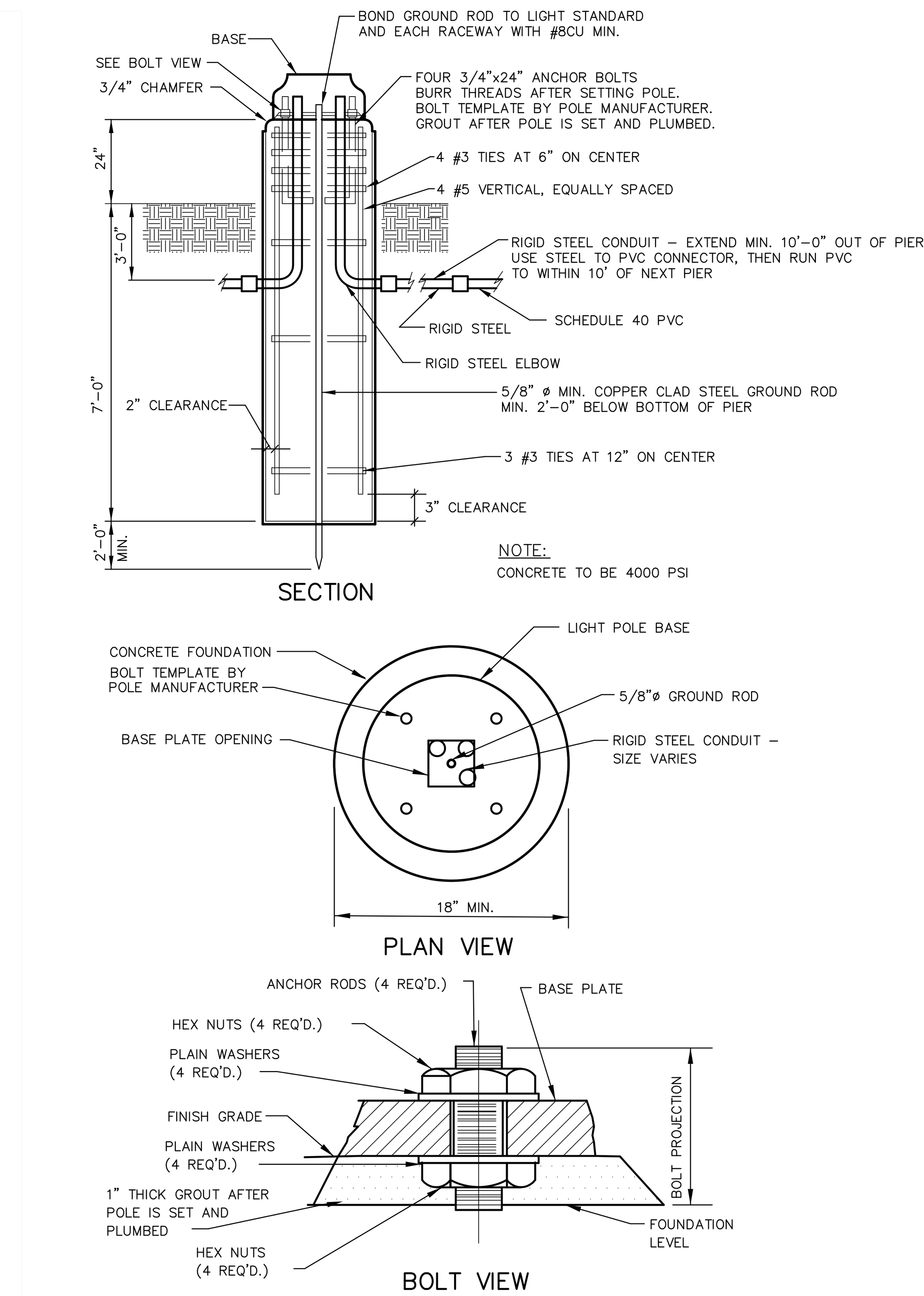
SHEET NUMBER:
C - 12

P4839

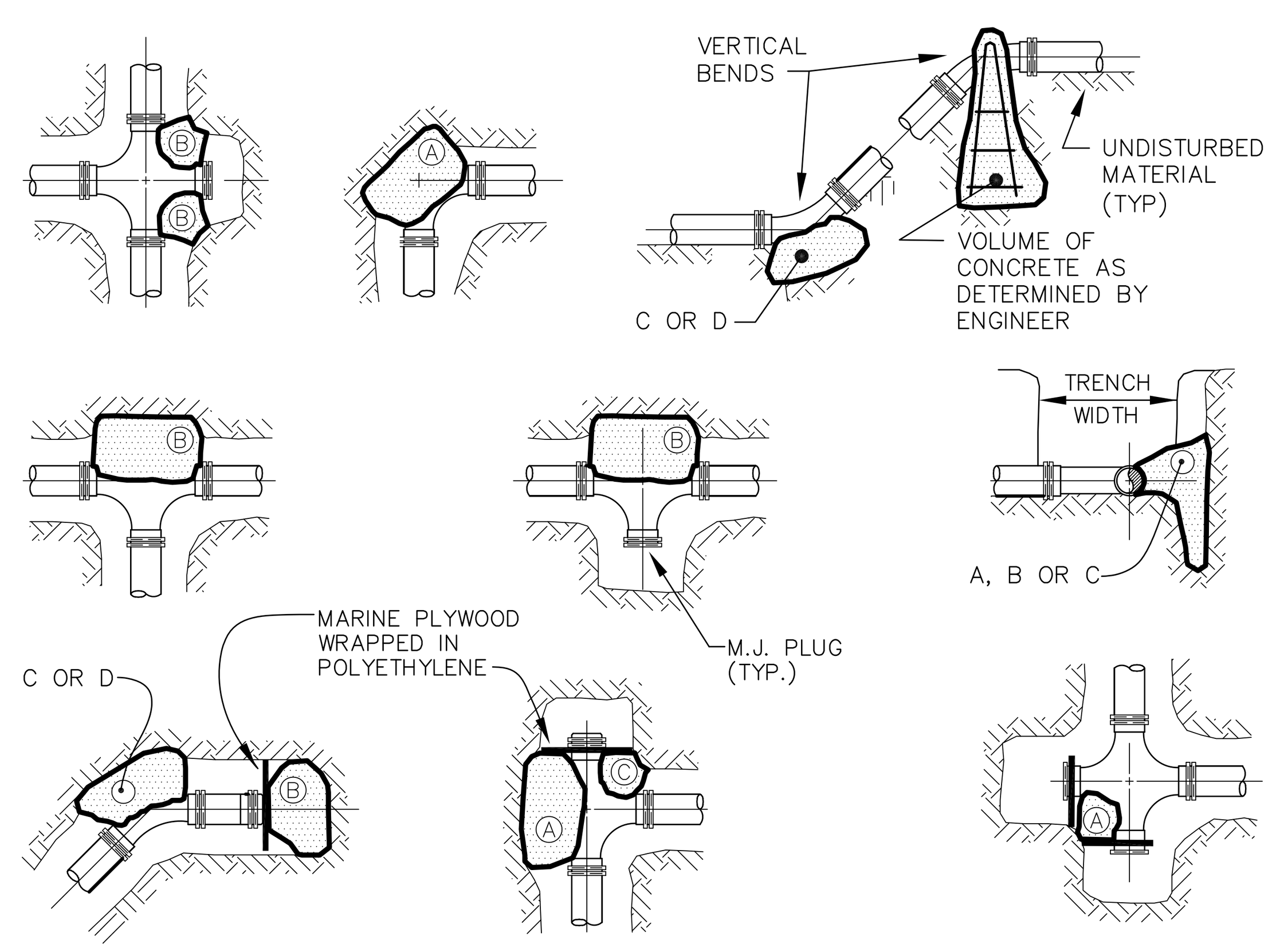




LIGHT FIXTURE CUT SHEETS NOT TO SCALE



LIGHT POLE BASE NOT TO SCALE



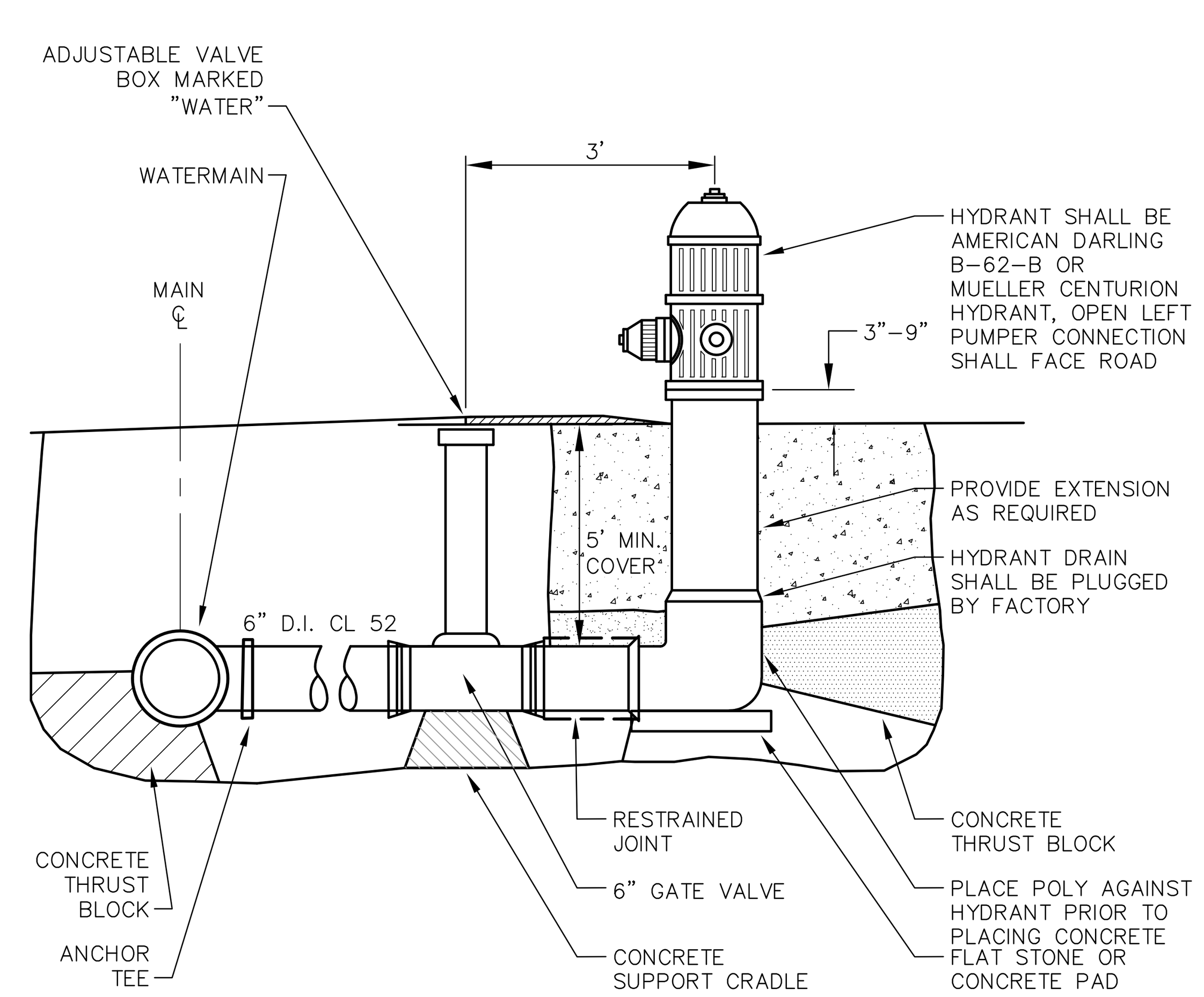
REACTION TYPE		SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL — PIPE SIZE 4"	6"	8"	10"	12"
A	90°	0.89	2.19	3.82	11.14	17.24
B	180°	0.65	1.55	2.78	8.38	12.00
C	45°	0.48	1.19	2.12	6.02	9.32
D	22-1/2°	0.25	0.60	1.06	3.08	4.74
E	11-1/4°	0.13	0.30	0.54	1.54	2.38

TEST PRESSURE = 150 psi

NOTES

1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL.
2. NO JOINTS SHALL BE COVERED WITH CONCRETE. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.
3. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
4. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.

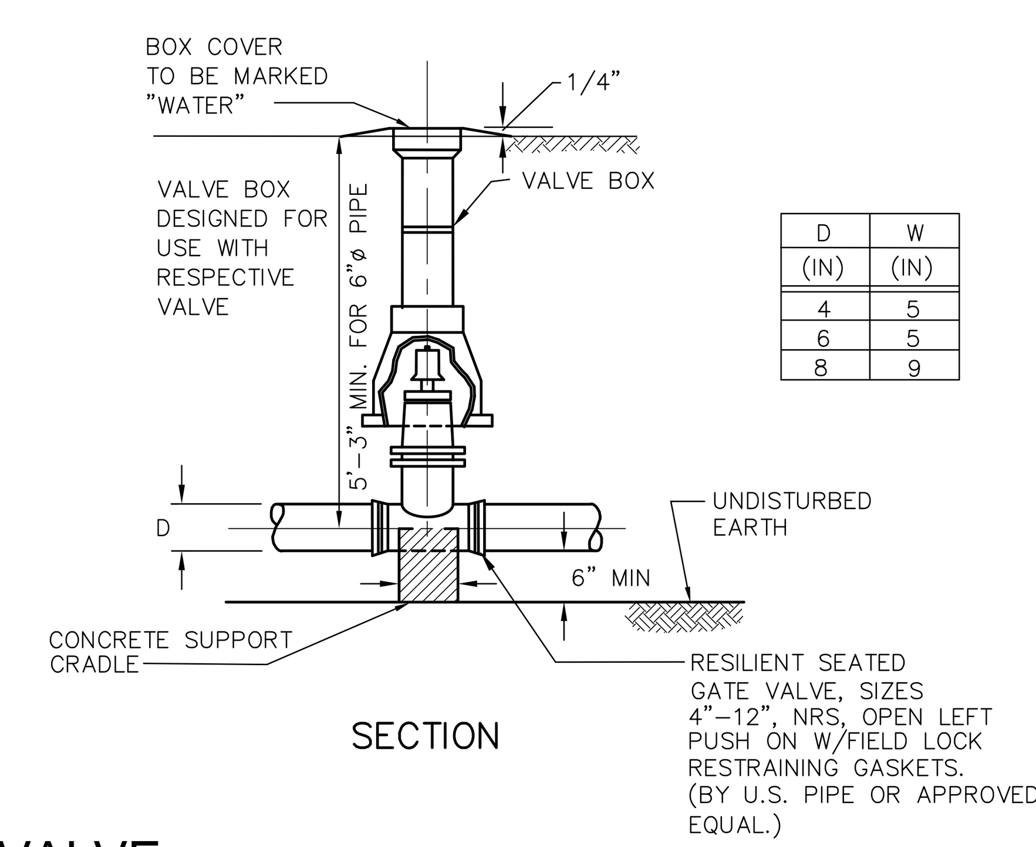
THRUST BLOCKING NOT TO SCALE



NOTES

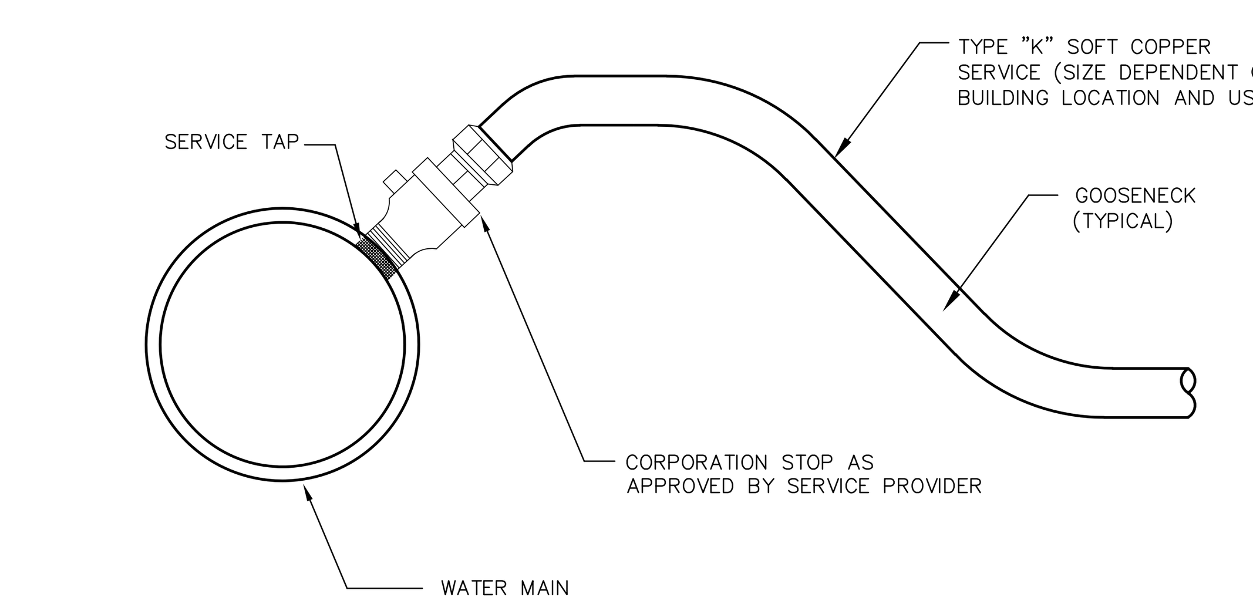
1. HYDRANT INSTALLATION AND OPERATION TO CONFORM TO REGULATIONS OF THE EXETER WATER & FIRE DEPARTMENT.
2. HYDRANT TO BE PAINTED YELLOW.
3. FIRE HYDRANT CONNECTION SHALL USE MEGALUG (RODS NOT ALLOWED).
4. DRAIN PLUG SHALL BE PLUGGED.
5. GATE VALVES SHALL BE 6" M.J. RESILIENT SEAT GATE VALVE, OPEN LEFT, CONFORMING TO EXTER WATER DEPARTMENT REQUIREMENTS.

FIRE HYDRANT NOT TO SCALE

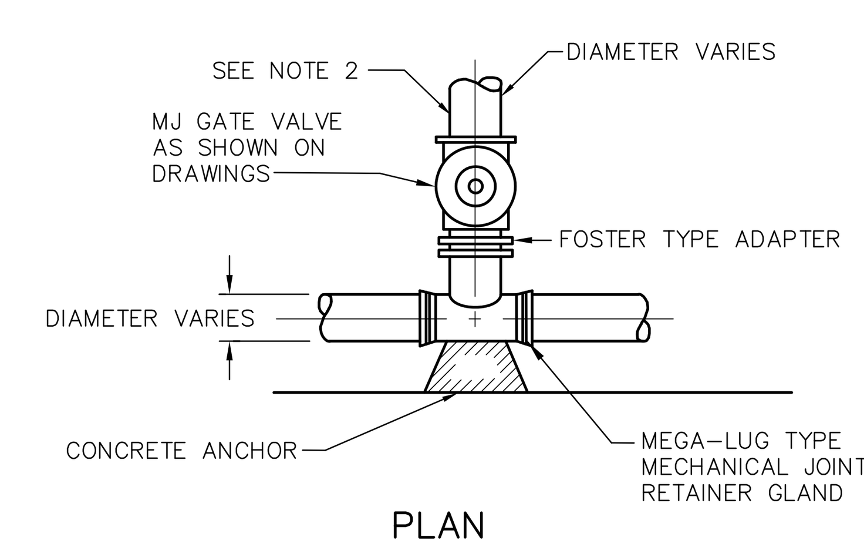


D (IN)	W (IN)
4	5
6	5
8	9

WATER VALVE NOT TO SCALE



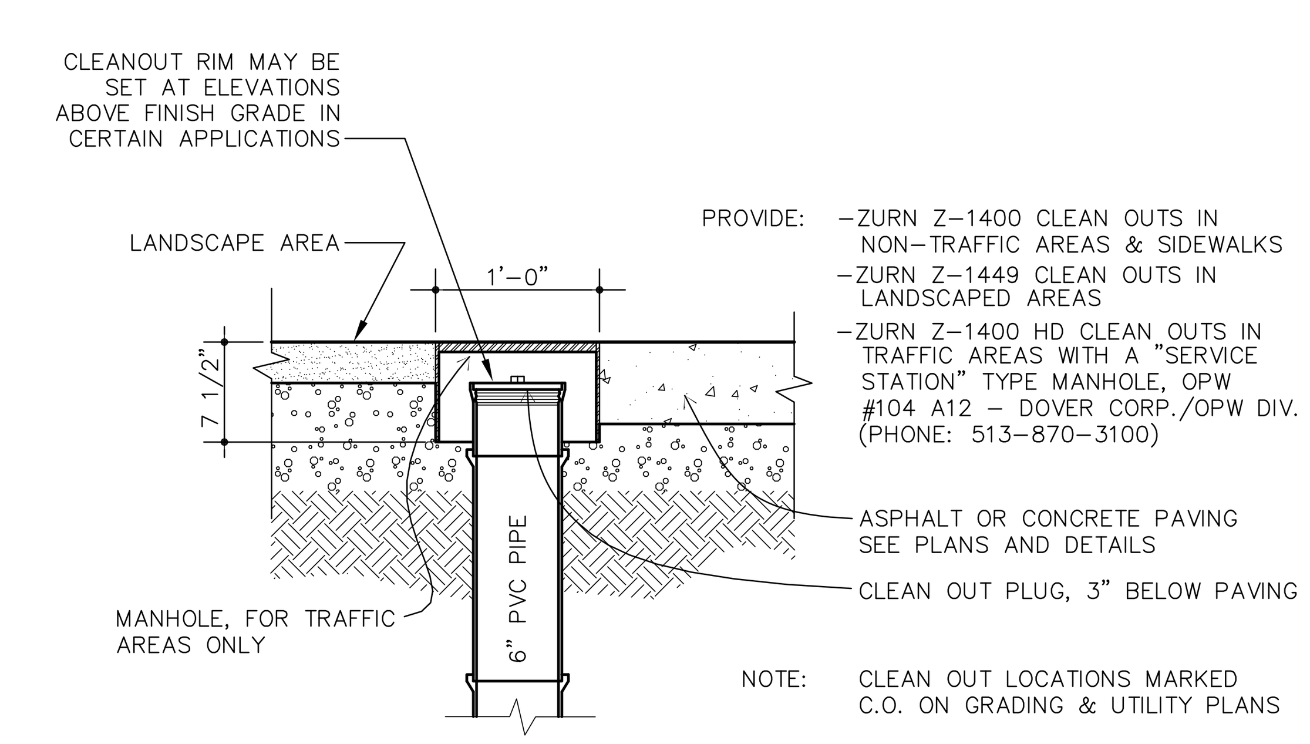
WATER SERVICE CONNECTION NOT TO SCALE



NOTES:

1. GATE VALVES SHALL OPEN RIGHT, PER CITY STANDARDS.
2. BRANCH PIPING SHALL BE MECHANICALLY RESTRAINED AS NOTED UNDER THRUST BLOCK DETAIL REQUIREMENTS.

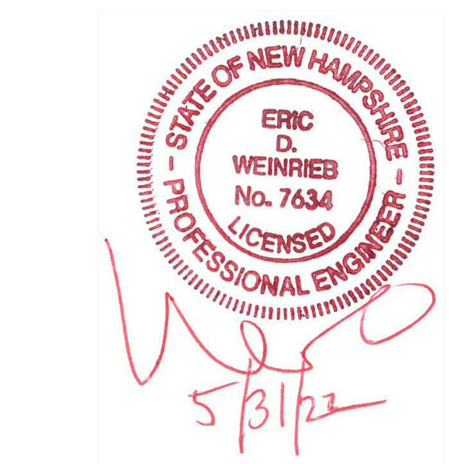
TEE & GATE VALVE ASSEMBLY NOT TO SCALE



SEWER CLEANOUT NOT TO SCALE

ALTUS ENGINEERING, INC.

133 Court Street
(603) 433-2335
Portsmouth, NH 03801
www.altus-eng.com



NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: MAY 31, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EBS	05/31/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 4839-SITE.dwg

SCALE: AS SHOWN

OWNER: GLERUPS, INC. 27 PLEASANT STREET NEWFIELDS, NH 03856

APPLICANT: GLERUPS, INC. 27 PLEASANT STREET NEWFIELDS, NH 03856

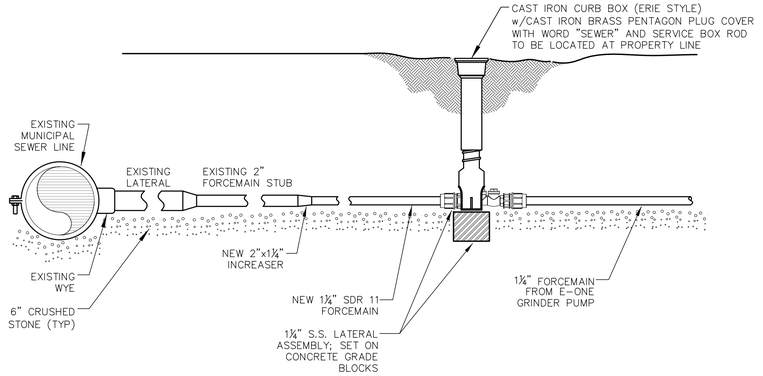
PROJECT: GLERUPS

TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE EXETER, NH

TITLE: DETAIL SHEET

SHEET NUMBER: C - 13

P4839



STUB CONNECTION - LOWER PRESSURE SEWER

NOT TO SCALE

Pumping Station: Furnish and install pump station as shown on the plans. Pump station shall include but not be limited to pump, controller, access cover, piping, fittings, valves, level sensors, electric service, siphon breaker, and level controls. Electrical wiring, circuits and conduit shall be designed by an electrical engineer or licensed electrician. All wiring shall be in compliance with the Town of Exeter, New Hampshire codes. All pump motor grinder units shall be of like type and horsepower. All internal discharge piping shall be 304 stainless steel. Contractor to submit shop drawings for all system components.

Pump Chamber: High density polyethylene tank with melt index of 2.0 grams /10 minutes or lower to dimensions shown. Corrugated sections shall be of double wall construction with a smooth interior wall.

Pumps: Low pressure pumps shall be supplied capable of delivering 15 gpm at 0' TDH and 9 gpm at 138' TDH. Pump must also be capable of operating at negative TDH without overloading motor. Motor shall be one phase, 1 h.p., and 1,725 rpm unless otherwise specified by the manufacturer and approved by the Engineer. Pumps shall be grinder sewage pump designed to operate in low pressure systems such as E\One semi-positive displacement sewer grinder pumps Model DH272 manufactured by Environment One Corporation (www.eone.com) or approved equal.

Piping: Contractor shall provide 1-¼" HDPE SDR 11 discharge pipe and 4" PVC SDR 35 gravity inlet pipe with push on joints and all other fittings necessary to provide a complete working system. Install full ported stainless steel ball valve rated for 200 psi minimum in discharge pipe (see detail). PVC ball valves will not be accepted. The working pressure of all check valves and curb stop shall be 150 psi minimum. Contractor shall provide redundant check valve assembly per manufacturer's recommendation. Piping shall be pressure tested for one hour at 100 psi.

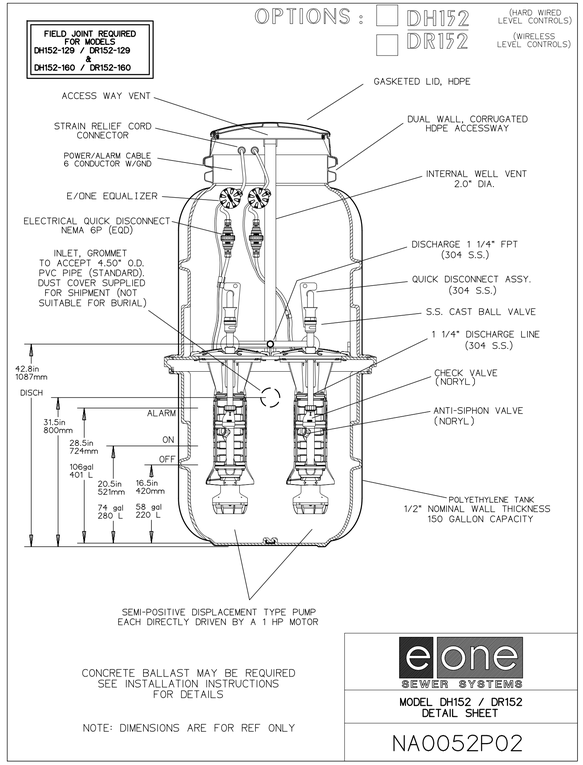
Controls: Non-fouling wastewater level controls for controlling pump operation shall be accomplished by monitoring the pressure changes in an integral air column connected to a pressure switch. Level detection device shall have no moving parts in direct contact with the wastewater. ON/OFF and High-level alarm functions shall not be controlled by the same switch.

Alarm Panel: NEMA 4X, UL listed duplex alternating alarm panel suitable for wall mounting. NEMA 4X enclosure shall include a hinged, lockable cover, padlock, and secured dead front. The alarm panel shall include the following features: run time meters, audio & visual alarm, push-to-run switch, and high level (redundant) pump starting control. Alarm sequence to be per manufacturer's installation instructions. Locate panel on building wall or post according to local codes and Owner's preference.

Ballast: Pump station shall not be installed without installation of ballast. See anchoring system detail.

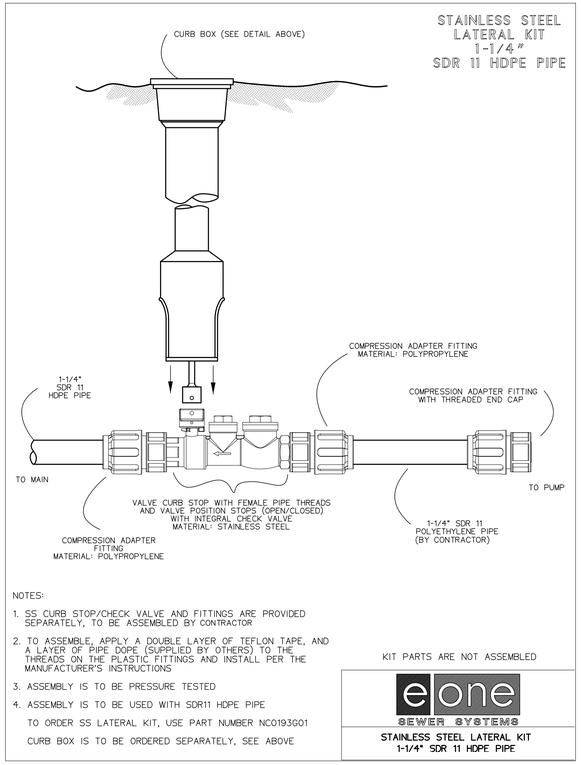
PUMPING STATION SPECIFICATIONS

NOT TO SCALE



DUPLEX PUMPING STATION

NOT TO SCALE



STAINLESS STEEL LATERAL KIT - 1 1/4" SDR 11 HDPE PIPE

NOT TO SCALE

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
7/26/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 26, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EBS	05/31/22
1	PER REVIEW COMMENTS	EBS	07/26/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 4839-SITE.dwg

SCALE: AS SHOWN

OWNER:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
DETAIL SHEET

SHEET NUMBER:
C - 14

P4839

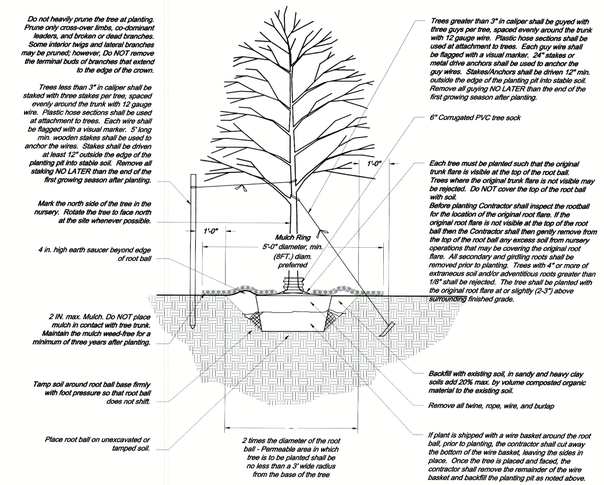
Plant List

TREES

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Af	*Acer freemanii 'Armstrong'*	Armstrong Maple	7	2.5-3" Cal	B&B
Ua	*Ulmus americana 'Princeton'*	Princeton American Elm	15	2.5-3" Cal	B&B

PERENNIALS, GROUNDCOVERS, VINES and ANNUALS

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Cal	*Calamagrostis acutifolia 'Karl Foerster'*	Feather Reed Grass	110	1 gal	



Tree Planting Detail

Landscape Notes

1. Design is based on drawings by Altus Engineering and may require adjustment due to actual field conditions.
2. The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
3. Erosion Control shall be in place prior to construction.
4. Erosion Control to consist of Hay Bales and Erosion Control Fabric shall be staked in place between the work and Water bodies, Wetlands and/or drainage ways prior to any construction.
5. The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
6. It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
7. Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
8. Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
9. The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 1-888-344-7233.
10. The Contractor shall procure any required permits prior to construction.
11. Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
12. Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a contractor is aware of a potential issue, and does not bring it to the attention of the landscape architect or owner's representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
13. The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
14. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
15. All plants shall be legibly tagged with proper botanical name.
16. The Contractor shall guarantee all plants for not less than one year from time of acceptance.
17. Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
18. No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
19. All landscaping shall be provided with the following:
    a. Outside hose attachments spaced a maximum of 150 feet apart, and
    b. An underground irrigation system, or
    c. A temporary irrigation system designed for a two-year period of plant establishment.
20. If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas.
21. The contractor is responsible for all plant material from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, and watering of plants. Plants shall be appropriately watered prior to, during and after planting. It is the contractor's responsibility to provide clean water suitable for plant health from off site, should it not be available on site.
22. All disturbed areas will be dressed with 6" of topsoil and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
23. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be black.
24. In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
25. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy. Within the sight distance triangles at vehicle intersections the canopies shall be raised to 8' min.
26. Snow shall be stored a minimum of 5' from shrubs and trunks of trees.
27. Landscape Architect is not responsible for the means and methods of the contractor.

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

NOT FOR CONSTRUCTION

ISSUED FOR: INITIAL SUBMISSION

ISSUE DATE: MAY 31, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	VM	05/31/22
1	PER REVISED SITE PLAN	VM	07/26/22

DRAWN BY: VM
APPROVED BY: RW
DRAWING FILE: 4839-SITE.dwg

SCALE:
22" x 34" – 1" = 40'
11" x 17" – 1" = 80'

OWNER:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

APPLICANT:
GLERUPS, INC.
27 PLEASANT STREET
NEWFIELDS, NH 03856

PROJECT:
GLERUPS
TAX MAP 46, LOT 7
19 CONTINENTAL DRIVE
EXETER, NH

TITLE:
LANDSCAPE PLAN

SHEET NUMBER:
L - 1

x


glerups


glerups

GOVE ENVIRONMENTAL SERVICES, INC.

NH DES WETLANDS BUREAU
MINOR IMPACT
DREDGE & FILL APPLICATION

For

GLERUPS, INC.

19 Continental Drive

Exeter, NH

June 23, 2022

Prepared By

Gove Environmental Services, Inc.
8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz / www.gesinc.biz

Table of Contents

Figures

Appendicies

STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

Water Division/Land Resources Management
Wetlands Bureau

Check the Status of your Application

RSA/Rule: RSA 482-A/Env-Wt 100-900

APPLICANT'S NAME: Glerups **TOWN NAME:** Exeter

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

A person may request a waiver of the requirements in Rules Env-Wt 100-900 to accommodate situations where strict adherence to the requirements would not be in the best interest of the public or the environment but is still in compliance with RSA 482-A. A person may also request a waiver of the standards for existing dwellings over water pursuant to RSA 482-A:26, III(b). For more information, please consult the Waiver Request Form.

SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2)) Please use the Wetland Permit Planning Tool (WPPT), the Natural Heritage Bureau (NHB) DataCheck Tool, the Aquatic Restoration Mapper, or other sources to assist in identifying key features such as: priority resource areas (PRAs), protected species or habitats, coastal areas, designated rivers, or designated prime wetlands.	
Has the required planning been completed?	☒ Yes ☐ No
Does the property contain a PRA? If yes, provide the following information:	☐ Yes ☒ No
• Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHF&G) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04.	☐ Yes ☐ No
• Protected species or habitat? o If yes, species or habitat name(s): o NHB Project ID #:	☐ Yes ☐ No
• Bog?	☐ Yes ☐ No
• Floodplain wetland contiguous to a tier 3 or higher watercourse?	☐ Yes ☐ No
• Designated prime wetland or duly-established 100-foot buffer?	☐ Yes ☐ No
• Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone?	☐ Yes ☐ No
Is the property within a Designated River corridor? If yes, provide the following information: • Name of Local River Management Advisory Committee (LAC): • A copy of the application was sent to the LAC on Month: Day: Year:	☐ Yes ☒ No

For dredging projects, is the subject property contaminated? • If yes, list contaminant:	☐ Yes ☒ No
Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	☒ Yes ☐ No
For stream crossing projects, provide watershed size (see WPPT or Stream Stats): no stream crossings	

SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))

Provide a **brief** description of the project and the purpose of the project, outlining the scope of work to be performed and whether impacts are temporary or permanent. DO NOT reply "See attached"; please use the space provided below.

The project involves construction of a +/- 95,000 sf industrial warehouse together with associated accessways, parking, stormwater management, and other related site improvements. The development will utilize approximately 11 acres of the 20-acre property situated at the cul-de-sac terminus of Continental Drive. Access will be provided via an easement across the existing driveway for the adjacent property (#15 Continental Drive). The remainder of the property, consisting of a narrow extension to an earlier point on Continental Drive, is largely wetland and will be left undisturbed. A total of 9,452 square feet of wetland fill and 448 square feet of temporary disturbance is proposed in order to construct the project.

SECTION 3 - PROJECT LOCATION

Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.

ADDRESS: 19 Continental Drive

TOWN/CITY: Exeter

TAX MAP/BLOCK/LOT/UNIT: 46-7-2

US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME: Little River
☐ N/A

(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places): 42.99122° North
70.98193° West

SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a)) If the applicant is a trust or a company, then complete with the trust or company information.		
NAME: Glerups, Inc. C/O Kiera Ryan		
MAILING ADDRESS: 27 Pleasant Street		
TOWN/CITY: Newfields	STATE: NH	ZIP CODE: 03856
EMAIL ADDRESS: kiera@glerups.com		
FAX:	PHONE: 6039787683	
ELECTRONIC COMMUNICATION: By initialing here: , I hereby authorize NHDES to communicate all matters relative to this application electronically.		
SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c)) ☐ N/A		
LAST NAME, FIRST NAME, M.I.: Quigley, Brendan		
COMPANY NAME: Gove Environmental Services, Inc (see attached authorization for owner and applicant signatures)		
MAILING ADDRESS: 8 Continental Drive Blg 2 Unit H		
TOWN/CITY: Exeter	STATE: NH	ZIP CODE: 03833
EMAIL ADDRESS: bquigley@gesinc.biz		
FAX:	PHONE: 603-778-0644	
ELECTRONIC COMMUNICATION: By initialing here BQ, I hereby authorize NHDES to communicate all matters relative to this application electronically.		
SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b)) If the owner is a trust or a company, then complete with the trust or company information. ☒ Same as applicant		
NAME:		
MAILING ADDRESS:		
TOWN/CITY:	STATE:	ZIP CODE:
EMAIL ADDRESS:		
FAX:	PHONE:	
ELECTRONIC COMMUNICATION: By initialing here , I hereby authorize NHDES to communicate all matters relative to this application electronically.		

SECTION 7 - RESOURCE-SPECIFIC CRITERIA ESTABLISHED IN Env-Wt 400, Env-Wt 500, Env-Wt 600, Env-Wt 700, OR Env-Wt 900 HAVE BEEN MET (Env-Wt 313.01(a)(3))

Describe how the resource-specific criteria have been met for each chapter listed above (please attach information about stream crossings, coastal resources, prime wetlands, or non-tidal wetlands and surface waters):
The boundary of the wetland was delineated by Gove Environmental Services utilizing the criteria specified in Env-Wt 406.01.

The project meets project specific design requirements for industrial development Env-Wt 524.04 (a) through (f):

a. The project does not involve stream crossings and is not subject to any other resource specific requirements.

b. All proposed stormwater management facilities are located in upland areas, the project does not use wetlands or surface waters to serve as stormwater treatment

c. The proposed project will incorporate stormwater management system in full compliance with State of NH regulations. The project lies outside of aquifers, source water protection areas, and wellhead protection zones.

d. The project does not involve stream or wetland crossing which have the potential to disrupt flows. The proposed edge impacts will not alter the drainage pattern in the wetland or to downstream waterways.

e. The project will not impact surface waters or wetland associated with fish habitat.

f. Since impacts are limited to the wetland edge only, wildlife movement through wetland specific habitat will not be restricted. Impacts to the vernal pool have been avoided. Disturbance in the buffer to the vernal pool has been minimized and the pool will remain connected to other adjacent wetland and and upland habitat.

SECTION 8 - AVOIDANCE AND MINIMIZATION

Impacts within wetland jurisdiction must be avoided to the maximum extent practicable (Env-Wt 313.03(a)).* Any project with unavoidable jurisdictional impacts must then be minimized as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization and the Wetlands Permitting: Avoidance, Minimization and Mitigation Fact Sheet. For minor or major projects, a functional assessment of all wetlands on the project site is required (Env-Wt 311.03(b)(10)).*

Please refer to the application checklist to ensure you have attached all documents related to avoidance and minimization, as well as functional assessment (where applicable). Use the Avoidance and Minimization Checklist, the Avoidance and Minimization Narrative, or your own avoidance and minimization narrative.

**See Env-Wt 311.03(b)(6) and Env-Wt 311.03(b)(10) for shoreline structure exemptions.*

SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)

If unavoidable jurisdictional impacts require mitigation, a mitigation pre-application meeting must occur at least 30 days but not more than 90 days prior to submitting this Standard Dredge and Fill Permit Application.

Mitigation Pre-Application Meeting Date: Month: Day: Year:

(☒ N/A - Mitigation is not required)

SECTION 10 - THE PROJECT MEETS COMPENSATORY MITIGATION REQUIREMENTS (Env-Wt 313.01(a)(1)c)

Confirm that you have submitted a compensatory mitigation proposal that meets the requirements of Env-Wt 800 for all permanent unavoidable impacts that will remain after avoidance and minimization techniques have been exercised to the maximum extent practicable: ☐ I confirm submittal.

(☒ N/A – Compensatory mitigation is not required)

SECTION 11 - IMPACT AREA (Env-Wt 311.04(g))

For each jurisdictional area that will be/has been impacted, provide square feet (SF) and, if applicable, linear feet (LF) of impact, and note whether the impact is after-the-fact (ATF; i.e., work was started or completed without a permit).

For intermittent and ephemeral streams, the linear footage of impact is measured along the thread of the channel. *Please note, installation of a stream crossing in an ephemeral stream may be undertaken without a permit per Rule Env-Wt 309.02(d), however other dredge or fill impacts should be included below.*

For perennial streams/rivers, the linear footage of impact is calculated by summing the lengths of disturbances to the channel and banks.

Permanent impacts are impacts that will remain after the project is complete (e.g., changes in grade or surface materials).

Temporary impacts are impacts not intended to remain (and will be restored to pre-construction conditions) after the project is completed.

JURISDICTIONAL AREA		PERMANENT			TEMPORARY		
		SF	LF	ATF	SF	LF	ATF
Wetlands	Forested Wetland	9452		☐	448		☐
	Scrub-shrub Wetland			☐			☐
	Emergent Wetland			☐			☐
	Wet Meadow			☐			☐
	Vernal Pool			☐			☐
	Designated Prime Wetland			☐			☐
	Duly-established 100-foot Prime Wetland Buffer			☐			☐
Surface Water	Intermittent / Ephemeral Stream			☐			☐
	Perennial Stream or River			☐			☐
	Lake / Pond			☐			☐
	Docking - Lake / Pond			☐			☐
	Docking - River			☐			☐
Banks	Bank - Intermittent Stream			☐			☐
	Bank - Perennial Stream / River			☐			☐
	Bank / Shoreline - Lake / Pond			☐			☐
Tidal	Tidal Waters			☐			☐
	Tidal Marsh			☐			☐
	Sand Dune			☐			☐
	Undeveloped Tidal Buffer Zone (TBZ)			☐			☐
	Previously-developed TBZ			☐			☐
	Docking - Tidal Water			☐			☐
TOTAL		9452			**448**		

SECTION 12 - APPLICATION FEE (RSA 482-A:3, I)

☐ **MINIMUM IMPACT FEE:** Flat fee of $400.

☐ **NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION:** Flat fee of $400 (refer to RSA 482-A:3, 1(c) for restrictions).

☐ **MINOR OR MAJOR IMPACT FEE:** Calculate using the table below:

Permanent and temporary (non-docking):	9900 SF	× $0.40 =	$ 3960
Seasonal docking structure:	SF	× $2.00 =	$
Permanent docking structure:	SF	× $4.00 =	$
Projects proposing shoreline structures (including docks) add $400 =			$
		Total =	$ 3960

The application fee for minor or major impact is the above calculated total or $400, whichever is greater = $ 3960

SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)
Indicate the project classification.

☐ Minimum Impact Project	☐ Minor Project	☒ Major Project

SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)

Initial each box below to certify:

Initials: EBS EBS BQ	To the best of the signer's knowledge and belief, all required notifications have been provided.
Initials: EBS EBS BQ	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.
Initials: EBS EBS BQ	The signer understands that: • The submission of false, incomplete, or misleading information constitutes grounds for NHDES to: 1. Deny the application. 2. Revoke any approval that is granted based on the information. 3. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1. • The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. • The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.
Initials: EBS EBS BQ	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.

SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)

SIGNATURE (OWNER):	PRINT NAME LEGIBLY: Erik Saari, Altus Engineering, Inc.--duly authorized	DATE: 06/23/22
SIGNATURE (APPLICANT, IF NOT OWNER):	PRINT NAME LEGIBLY: Erik Saari, Altus Engineering, Inc.--duly authorized	DATE: 06/23/22
SIGNATURE (AGENT, IF APPLICABLE):	PRINT NAME LEGIBLY: Brendan Quigley Conservation Svcs.	DATE: 6-23-22

SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))

As required by RSA 482-A:3, I(a)(1), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

TOWN/CITY CLERK SIGNATURE:	PRINT NAME LEGIBLY:
TOWN/CITY:	DATE:

Letter of Authorization

Glerups, Inc., hereby authorizes Altus Engineering, Inc. of Portsmouth, NH to represent us the as the Owner and Applicant in all matters concerning the engineering and related permitting of a site plan on Exeter Tax Map 47, Lot 7-2 located at 19 Continental Drive in Exeter, New Hampshire. This authorization shall include representation at public hearings and other project-related meetings in addition to any signatures required for Federal, State and Municipal permit applications.

Kiera Ryan	Kiera Manahan Ryan	5-18-22
Signature	Print Name	Date
Barry ryan	Barry T. Ryan	5-18-22
Witness	Print Name	Date

STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION ATTACHMENT A: MINOR AND MAJOR PROJECTS

Water Division/Land Resources Management

Wetlands Bureau

Check the Status of your Application

RSA/ Rule: RSA 482-A/ Env-Wt 311.10; Env-Wt 313.01(a)(1); Env-Wt 313.03

APPLICANT'S NAME: Glerups, Inc **TOWN NAME:** Exeter

Attachment A is required for *all minor and major projects*, and must be completed *in addition* to the Avoidance and Minimization Narrative or Checklist that is required by Env-Wt 307.11.

For projects involving construction or modification of non-tidal shoreline structures over areas of surface waters having an absence of wetland vegetation, only Sections I.X through I.XV are required to be completed.

PART I: AVOIDANCE AND MINIMIZATION

In accordance with Env-Wt 313.03(a), the Department shall not approve any alteration of any jurisdictional area unless the applicant demonstrates that the potential impacts to jurisdictional areas have been avoided to the maximum extent practicable and that any unavoidable impacts have been minimized, as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization.

SECTION I.I - ALTERNATIVES (Env-Wt 313.03(b)(1))

Describe how there is no practicable alternative that would have a less adverse impact on the area and environments under the Department's jurisdiction.

WAREHOUSE FACILITIES ARE DESIGNED FOR EFFICIENT MANAGEMENT OF INTERNAL SPACE, DOCKING FACILITIES, AND EXTERNAL CIRCULATION OF TRUCK TRAFFIC. THIS TRANSLATES TO A RELATIVELY INFLEXIBLE, BOXY DESIGN THAT REQUIRES A LARGE CONTIGUOUS AREA. THE PROPOSED FACILITY IS ALSO BEING CONSTRUCTED TO MEET THE SPACE REQUIREMENTS OF A SPECIFIC TENANT.

THE PROPERTY IS CONSTRAINED BY WETLAND ON ALL SIDES, INCLUDING TWO FINGERS EXTENDING FROM THE SOUTHERN PROPERTY LINES TOWARD THE MIDDLE OF THE SITE. ACCESS IS ALSO DICTATED VIA AN EASEMENT FROM THE DRIVEWAY OF THE ADJACENT PROPERTY WITH A LARGE VERNAL POOL EXISTING ADJACENT TO THIS AREA. ACCESSING THE PROPERTY IN ANY OTHER LOCATION WOULD INVOLVE SIGNIFICANTLY MORE WETLAND IMPACT.

THE DEVELOPMENT HAS BEEN LOCATED TO UTILIZE THE CONTIGUOUS UPLAND ROUGHLY IN THE MIDDLE OF THE SITE AND LIMIT WETLAND IMPACTS TO TWO FINGERS OF WETLAND EXTENDING INTO THE MIDDLE OF THE SITE AND SEVERAL SMALLER AT THE EDGES OF THE SURROUNDING WETLAND. DIRECT IMPACT TO THE VERNAL POOL HAS BEEN AVOIDED AND IMPACT TO THE UPLAND SURROUNDING THE POOL HAS BEEN MINIMIZED TO THE MAXIMUM EXTENT POSSIBLE GIVEN THE LOCATION OF THE ACCESS AND NEED FOR TRAFFIC CIRCULATION AROUND THE BUILDING. IMPACTS OVERALL HAVE ALSO BEEN MINIMIZED BY UTILIZING RETAINING WALLS AND STEEP GRADING AND THE EDGES OF THE DEVELOPMENT.

GIVEN THE DESIGN CRITERIA, THE SITE CONSTRAINTS, AND IMPACT MINIMIZATION MEASURES ALREADY EMPLOYED, THERE IS NO OTHER FEASIBLE ALTERNATIVE WITH LESS IMPACT TO WETLANDS.

SECTION I.II - MARSHES (Env-Wt 313.03(b)(2))

Describe how the project avoids and minimizes impacts to tidal marshes and non-tidal marshes where documented to provide sources of nutrients for finfish, crustacean, shellfish, and wildlife of significant value.

There is no freshwater marsh on the site nor is there any tidal marsh in this area.

SECTION I.III - HYDROLOGIC CONNECTION (Env-Wt 313.03(b)(3))

Describe how the project maintains hydrologic connections between adjacent wetland or stream systems.

The proposed impacts are located at the edges of a large, forested wetland system that ultimately drains to the Little River approximately 1,000 feet southwest of the site. The project does not involve wetland crossings or other impacts that would segment or disrupt flow into, within, or out of the larger wetland complex. Hydrologic connections will not therefore be affected.

SECTION I.IV - JURISDICTIONAL IMPACTS (Env-Wt 313.03(b)(4))

Describe how the project avoids and minimizes impacts to wetlands and other areas of jurisdiction under RSA 482-A, especially those in which there are exemplary natural communities, vernal pools, protected species and habitat, documented fisheries, and habitat and reproduction areas for species of concern, or any combination thereof.

The development has been clustered in the contiguous upland in the middle of the site. Wetland crossings or segmentation has been avoided and wetland impacts are limited to the edges of the surrounding wetland. Edge impacts have been minimized by utilizing retaining walls and steep slopes. Direct impact to the vernal pool has been avoided and impact to the supporting upland habitat surrounding the pool has been minimized to the maximum extent possible given the location of the access and need for traffic circulation around the building. The development also utilizes bioretention stormwater treatment which will not only provide effective stormwater treatment but will also provide a softer vegetated edge in proximity to wetlands.

SECTION I.V - PUBLIC COMMERCE, NAVIGATION, OR RECREATION (Env-Wt 313.03(b)(5))

Describe how the project avoids and minimizes impacts that eliminate, depreciate or obstruct public commerce, navigation, or recreation.

The project will not impact navigable waters, nor will it directly involve elements of public commerce or recreation as they relate to wetland resource areas.

SECTION I.VI - FLOODPLAIN WETLANDS (Env-Wt 313.03(b)(6))

Describe how the project avoids and minimizes impacts to floodplain wetlands that provide flood storage.

The project will not impact the floodplain or floodplain wetlands

SECTION I.VII - RIVERINE FORESTED WETLAND SYSTEMS AND SCRUB-SHRUB – MARSH COMPLEXES (Env-Wt 313.03(b)(7))

Describe how the project avoids and minimizes impacts to natural riverine forested wetland systems and scrub-shrub – marsh complexes of high ecological integrity.

There are no such resources in the project area.

SECTION I.VIII - DRINKING WATER SUPPLY AND GROUNDWATER AQUIFER LEVELS (Env-Wt 313.03(b)(8))

Describe how the project avoids and minimizes impacts to wetlands that would be detrimental to adjacent drinking water supply and groundwater aquifer levels.

The proposed wetland impacts will not segment wetlands or disrupt flow paths such that groundwater may be affected and will infiltrate treated stormwater in accordance with AOT regulations. Also. the project does not lie in an aqufer area.

SECTION I.IX - STREAM CHANNELS (Env-Wt 313.03(b)(9))

Describe how the project avoids and minimizes adverse impacts to stream channels and the ability of such channels to handle runoff of waters.

The project does not impact streams directly nor does it propose wetland crossings which could negatively affect stream channels outside the impact area. The stormwater management system will ensure that runoff from the development does not adversely affect downstream flows.

SECTION I.X - SHORELINE STRUCTURES - CONSTRUCTION SURFACE AREA (Env-Wt 313.03(c)(1))

Describe how the project has been designed to use the minimum construction surface area over surface waters necessary to meet the stated purpose of the structures.

N/A, the project does not involve surface water or shoreline structures

SECTION I.XI - SHORELINE STRUCTURES - LEAST INTRUSIVE UPON PUBLIC TRUST (Env-Wt 313.03(c)(2))

Describe how the type of construction proposed is the least intrusive upon the public trust that will ensure safe docking on the frontage.

N/A, the project does not involve surface water or shoreline structures

SECTION I.XII - SHORELINE STRUCTURES – ABUTTING PROPERTIES (Env-Wt 313.03(c)(3))

Describe how the structures have been designed to avoid and minimize impacts on ability of abutting owners to use and enjoy their properties.

N/A, the project does not involve surface water or shoreline structures

SECTION I.XIII - SHORELINE STRUCTURES – COMMERCE AND RECREATION (Env-Wt 313.03(c)(4))

Describe how the structures have been designed to avoid and minimize impacts to the public's right to navigation, passage, and use of the resource for commerce and recreation.

N/A, the project does not involve surface water or shoreline structures

SECTION I.XIV - SHORELINE STRUCTURES – WATER QUALITY, AQUATIC VEGETATION, WILDLIFE AND FINFISH HABITAT (Env-Wt 313.03(c)(5))

Describe how the structures have been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.

N/A, the project does not involve surface water or shoreline structures

SECTION I.XV - SHORELINE STRUCTURES – VEGETATION REMOVAL, ACCESS POINTS, AND SHORELINE STABILITY (Env-Wt 313.03(c)(6))

Describe how the structures have been designed to avoid and minimize the removal of vegetation, the number of access points through wetlands or over the bank, and activities that may have an adverse effect on shoreline stability.

N/A, the project does not involve surface water or shoreline structures

PART II: FUNCTIONAL ASSESSMENT
REQUIREMENTS Ensure that project meets the requirements of Env-Wt 311.10 regarding functional assessment (Env-Wt 311.04(j); Env-Wt 311.10).
FUNCTIONAL ASSESSMENT METHOD USED: ACOE Highway Metholodology
NAME OF CERTIFIED WETLAND SCIENTIST (FOR NON-TIDAL PROJECTS) OR QUALIFIED COASTAL PROFESSIONAL (FOR TIDAL PROJECTS) WHO COMPLETED THE ASSESSMENT: BRENDAN QUIGLEY
DATE OF ASSESSMENT: 1/10/22
Check this box to confirm that the application includes a NARRATIVE ON FUNCTIONAL ASSESSMENT: ☒
For minor or major projects requiring a standard permit without mitigation, the applicant shall submit a wetland evaluation report that includes completed checklists and information demonstrating the RELATIVE FUNCTIONS AND VALUES OF EACH WETLAND EVALUATED. Check this box to confirm that the application includes this information, if applicable: ☒ Note: The Wetlands Functional Assessment worksheet can be used to compile the information needed to meet functional assessment requirements.

AVOIDANCE AND MINIMIZATION WRITTEN NARRATIVE

Water Division/Land Resources Management

Wetlands Bureau

Check the Status of your Application

RSA/ Rule: RSA 482-A/ Env-Wt 311.04(j); Env-Wt 311.07; Env-Wt 313.01(a)(1)b; Env-Wt 313.01(c)

APPLICANT'S NAME: Glerups, Inc **TOWN NAME: Exeter**

An applicant for a standard permit shall submit with the permit application a written narrative that explains how all impacts to functions and values of all jurisdictional areas have been avoided and minimized to the maximum extent practicable. This attachment can be used to guide the narrative (attach additional pages if needed). Alternatively, the applicant may attach a completed Avoidance and Minimization Checklist (NHDES-W-06-050) to the permit application.

SECTION 1 - WATER ACCESS STRUCTURES (Env-Wt 311.07(b)(1)) Is the primary purpose of the proposed project to construct a water access structure?
No
SECTION 2 - BUILDABLE LOT (Env-Wt 311.07(b)(1)) Does the proposed project require access through wetlands to reach a buildable lot or portion thereof?
A portion of the impacts are required for access due to the presence of wetlands surrounding the upland and limited access locations
SECTION 3 - AVAILABLE PROPERTY (Env-Wt 311.07(b)(2))* For any project that proposes permanent impacts of more than one acre, or that proposes permanent impacts to a PRA, or both, are any other properties reasonably available to the applicant, whether already owned or controlled by the applicant or not, that could be used to achieve the project's purpose without altering the functions and values of any jurisdictional area, in particular wetlands, streams, and PRAs? **Except as provided in any project-specific criteria and except for NH Department of Transportation projects that qualify for a categorical exclusion under the National Environmental Policy Act.*
The project proposes 9,452 SF of permanent impact and there are no PRAs on the site. Offsite alternatives analysis is not required

SECTION 4 - ALTERNATIVES (Env-Wt 311.07(b)(3))

Could alternative designs or techniques, such as different layouts, different construction sequencing, or alternative technologies be used to avoid impacts to jurisdictional areas or their functions and values as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization?

The project clusters development in the central upland area, avoids wetland crossings, and limits impacts to the edges of the wetland. Retaining walls and steep stabilized slopes are used to limit impacts due to grading. Stormwater management will make use of vegetated bio-retention and infiltration basins. (also see Section 4 of the narrative)

SECTION 5 - CONFORMANCE WITH Env-Wt 311.10(c) (Env-Wt 311.07(b)(4))**

How does the project conform to Env-Wt 311.10(c)?

***Except for projects solely limited to construction or modification of non-tidal shoreline structures only need to complete relevant sections of Attachment A.*

The primary functions of the resource areas were determined to be wildlife habitat, production export for wildlife food sources, and water quality. While water quality and production export function are supported uniformly in all the wetlands on the site. Wildlife habitat is concentrated in the vernal pool and the interior portions of the larger wetland, particularly closer to the Little River conservation land. Impact to the vernal pool, which has the most prominent wetland habitat function, has been avoided. Wetland specific wildlife habitat elsewhere on the site has been preserved by avoiding impacts which segment the wetland and limiting impact to the edges of the wetland with comparatively less function. Water quality function has been preserved by avoiding crossings or other impacts that may disrupt flow. (also see section 2.3 and 4.4 of the narrative)

1.0 Introduction

This Major Impact Dredge and Fill Application is being submitted by Gove Environmental Services, Inc. on behalf of Glerups, Inc. for the construction of a warehouse building at 19 Continental Drive in Exeter, NH. The 20-acre property is identified as Map 46 Lot 7-2 on the Exeter tax maps and is comprised of undeveloped land located within the Garrison Glen Industrial Park near the end of Continental Drive. The proposed project will utilize approximately 11 acres located at the cul-de-sac terminus of Continental Drive with access through an existing driveway and easement on the adjacent lot. A total of 9,900 square feet of wetland impact is proposed to accommodate the proposed development, 448 square feet of which is temporary. The wetlands, proposed impacts, and project are discussed in more detail in the following sections.

2.0 Wetland Resources

2.1 Wetland Delineation

Wetlands were delineated by Brendan Quigley of Gove Environmental Services, Inc. in early December of 2021 utilizing the following standards:

1. *US Army Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1 (Jan 1987) **AND** *Regional Supplement to Corps of Engineers Wetland Delineation Manual; Northcentral and Northeast Region,* Version 2.0, January 2012.
2. *Field Indicators for Identifying Hydric Soils in New England, Version 4,* April 2019, New England Interstate Water Pollution Control Commission, Lowell, MA.
3. *US Army Corps of Engineers National Wetland Plant List*, 2018

Flagging in the project area was surveyed by Hayner Swanson. The dominant wetland type on the property is saturated and seasonally flooded forested wetland dominated by red maple and highbush blueberry (PFO1E). These wetlands have developed in predominantly poorly drained soil amongst a landscape of small hills, boulders, and exposed ledge that is common in this area and present on all the adjacent properties. Portions of the site, including portions of the wetland, were logged roughly seven years ago. These areas have an earlier successional character with denser shrub cover and fewer trees. These wetlands represent the upper reaches of the broader network of wetland associated with the Little River, which itself lies off-site approximately 1,000 feet southwest of the site

2.2 Vernal Pools

A vernal pool investigation was conducted in the spring of 2022. A single vernal pool was identified in the northern corner of the property. The pool occupies a shallow depression east of the discontinued path of Garrison Lane. Water in this pool appears to be at least partially impounded by grade differences and lack of proper drainage within this historical road. The limit of this pool appears on the project plans.

2.3 Wetland Function and Value Assessment

A wetland function and value assessment was conducted using the US Army Corps Highway Methodology guidelines. Functions are self-sustaining properties of wetlands, which exist in the absence of human involvement. Values refers to the benefits gained by society from a given wetland or ecosystem and their inherit functions. Functions and values identified as "primary" have been determined to be significant features of the wetland being evaluated. An important distinction is that the primary functions and values of a particular wetland does not necessarily indicating the wetland supports them at a significant *level* in comparison to other wetlands in the region or even near the site.

The Highway Methodology considers 13 functions and values:

1. **Groundwater recharge/discharge:** This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. Recharge should relate to the potential for the wetland to contribute water to an aquifer. Discharge should relate to the potential for the wetland to serve as an area where ground water can be discharged to the surface.
2. **Floodflow Alteration:** This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events.
3. **Fish and Shellfish Habitat:** This function considers the effectiveness of seasonal or permanent water bodies associated with the wetland in question for fish and shellfish habitat.
4. **Sediment/Toxicant/Pathogen Retention:** This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens.
5. **Nutrient Removal/Retention/Transformation:** This function relates to the effectiveness of the wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.
6. **Production Export:** This function relates to the effectiveness of the wetland to produce food or usable products for human, or other living organisms.
7. **Sediment/Shoreline Stabilization:** This function relates to the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.

8. **Wildlife Habitat:** This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and or migrating species must be considered.
9. **Recreation:** This value considers the effectiveness of the wetland and associated watercourses to provide recreational opportunities such as canoeing, boating, fishing, hunting and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals or other resources that are intrinsic to the wetland, whereas non-consumptive opportunities do not.
10. **Educational/Scientific Value:** This value considers the effectiveness of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.
11. **Uniqueness/Heritage:** This value relates to the effectiveness of the wetland or its associated water bodies to produce certain special values. Special values may include such things as archeological sites, unusual aesthetic quality, historical events, or unique plants, animals, or geological features.
12. **Visual Quality/Aesthetics:** This value relates to the visual and aesthetic qualities of the wetland.
13. **Threatened or Endangered Species Habitat:** This value relates to the effectiveness of the wetland or associated water bodies to support threatened or endangered species.

Several of the functions and values listed above are either not supported or supported in a very limited way by the wetlands on this site. The primary limiting characteristic is the lack of closer association with surface water. Most obviously these wetlands do not support fish habitat or shoreline stabilization, both of which are directly related to the interaction of vegetated wetland and waterbody. Direct interaction between a water body and a wetland, such as takes place in the floodplain, is also a large part of flood attenuation function. The wetlands on this site do not support this type of flood attenuation but are able to intercept and attenuate runoff in the watershed. Since storage potential is limited however, their flood attenuation role is likely minor. Wetland supported recreation is also strongly linked with surface water for activities such as boating and fishing which are not supported in these wetlands. Lack of surface water combined with their relatively uniform and common character also limits their relevance to values that are typically associated with more diverse, unique, or accessible wetlands. This would include scientific and educational pursuits, general aesthetics, and heritage. Lastly, the low permeability of the soils on the site may produce some discharge of shallow groundwater on slopes but does not allow significant interaction with the groundwater. These wetlands are not characteristic of groundwater discharge or recharge areas.

Based on the characteristics of the wetlands and their location in the landscape it was determined that Wildlife Habitat, Production-Export, and Sediment/Toxicant Retention & Nutrient Removal are the principal functions of the wetlands on the site. These functions

are described in greater detail in the following sections. The assessment forms are included in the Appendix C.

Wildlife Habitat— Wildlife habitat is clearly the principal function of the portion of wetland that supports vernal pool breeding habitat. This type of habitat is highly specific and not supported in the other areas of wetland on the property. The remainder of the wetland supports general wildlife habitat, the value of which is elevated by the large block of unfragmented forest and waterway within the Little River Conservation land which lies directly adjacent to the property.

Production Export –In this case, Production Export function is closely related to wildlife habitat by way of production of wildlife food sources. The early successional species currently present in recently logged areas of the wetland combined with mast producing trees (principally oaks) produce an abundant source of berries, nuts, seeds, and pollen bearing flowers. This likely provides a substantial source of food for wildlife. It is notable that function is supported across much of the site, including upland areas which contain more of the mast producing oak.

Sediment/Toxicant Retention & Nutrient Removal – Due to their location upstream of the Little River conservation land and considering the significant development pressure in this area, the wetlands likely play an important role in protecting the water quality within Little River and other high value wetlands in the conservation land. The wetlands on the property lack significant streams or other defined drainage paths. This diffuse drainage pattern provides the opportunity for treatment long before reaching more defined flow paths downstream.

3.0 Proposed Project

The project involves construction of a +/- 95,000 square foot industrial warehouse together with associated accessways, parking, stormwater management, and other related site improvements. The project has been designed for and will be occupied by Glerups, Inc. who also owns the property. The development will utilize approximately 11 acres of the 20-acre property situated at the cul-de-sac terminus of Continental Drive. Access will be provided via an easement across the existing driveway for the adjacent property (#15 Continental Drive). The remainder of the property, consisting of a narrow extension to an earlier point on Continental Drive, is largely wetland and will be left undisturbed. A total of 9,452 square feet of wetland fill is proposed to construct the project. An additional 448 square feet of temporary disturbance is also proposed in order to construct the two retaining walls being used to minimize impacts.

4.0 Alternatives Analysis

4.1 Project Purpose

The proposed facility is being constructed to meet the location, space, and operational requirements of Glerups, Inc. to support the distribution and sale of their products (specialty shoes) in the U.S.

4.2 Site Constraints

The property is constrained by wetland on all sides, including two fingers extending from the southern property lines toward the middle of the site. The fingers make it nearly impossible to site an industrial use on the site, a use which has been specifically envisioned for the property and for which the property is zoned. Access is also dictated via an easement from the driveway of the adjacent property with a large vernal pool existing adjacent to this area. The narrow "arm" of the property extending around the back of the adjacent properties to Continental Dive has extensive wetland, including 100-year floodplain, and cannot be utilized for access or any other aspect of the project. Accessing the property in any other location would therefore involve significantly more wetland impact and more valuable resource areas.

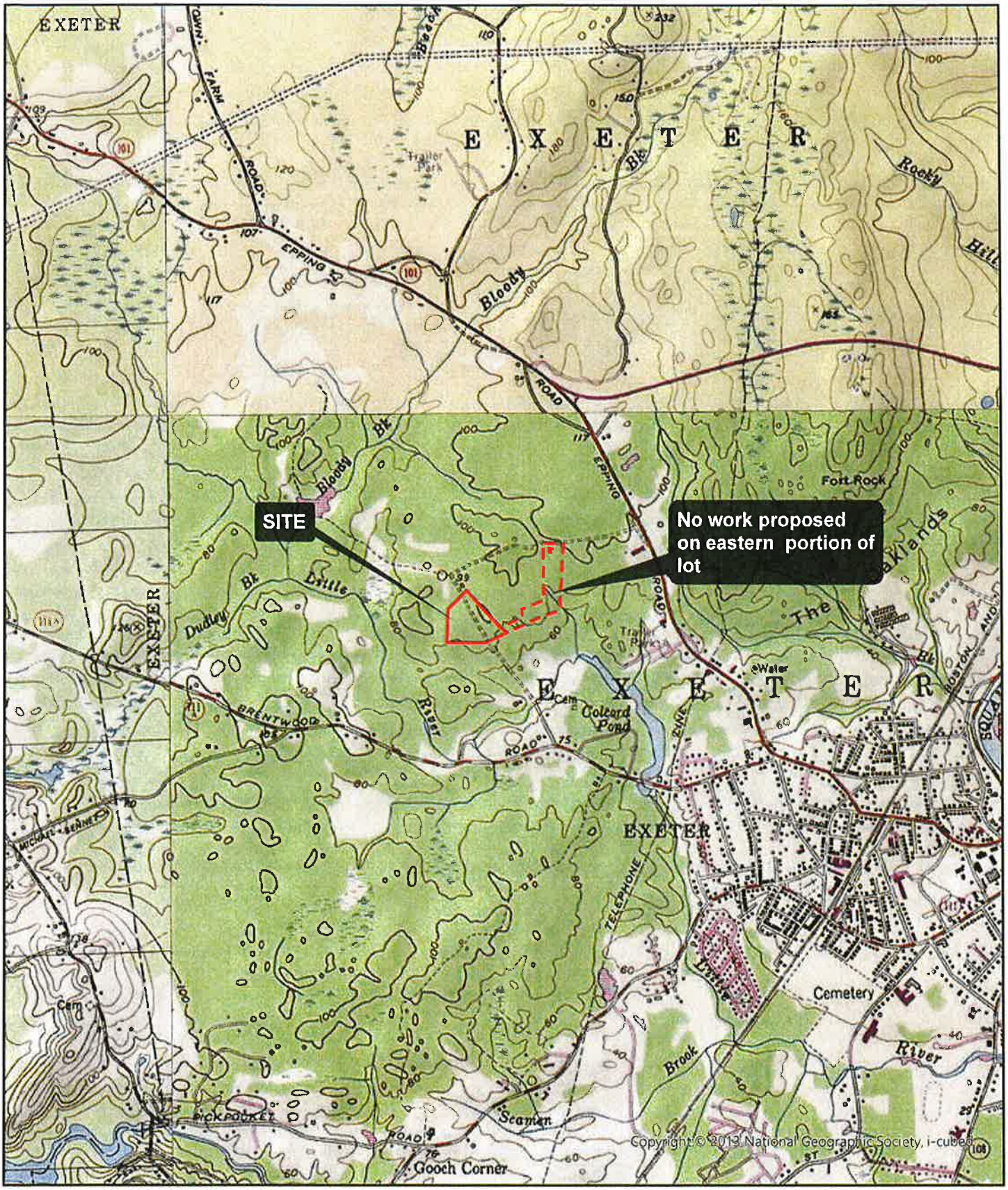
4.3 Avoidance & Minimization

Warehouse facilities such as this are designed for efficient management of internal space, docking facilities, and external circulation of truck traffic. This translates to a relatively inflexible, boxy design that requires a large contiguous area. The development has been located to utilize the contiguous upland roughly in the middle of the site and limit wetland impacts to the two fingers of wetland extending into the middle of the site and several smaller areas at the edges of the surrounding wetland. Direct impact to the vernal pool has been avoided and impact to the upland surrounding the pool has been minimized to the maximum extent possible given the location of the access and need for traffic circulation around the building. Impacts overall have also been minimized by utilizing retaining walls and steep grading and the edges of the development. Given the design criteria, the site constraints, and impact minimization measures already employed, there is no other feasible alternative with less impact to wetlands.

4.4 Conformance With Env-Wt 311.10

In addition to avoiding and minimizing impacts overall, the project has been designed to avoid the most valuable areas of wetland and preserve wetland functions and values to the maximum extent practicable. The primary functions of the resource areas were determined to be related to wildlife habitat, production export for wildlife food sources,

and water quality. While water quality and production export function are supported rather uniformly in all the wetlands on the site, wildlife habitat is concentrated in the vernal pool and the interior portions of the larger wetland, particularly closer to the Little River conservation land. Impacts to the vernal pool, which is the single most valuable resource areas on the site have been avoided. Additionally, by limiting wetland impact elsewhere to the edges and narrow extensions of the wetland, the more valuable wetland specific wildlife habitat on the interior has been preserved. The project also avoids crossings or larger incursions into the body of the wetland to so that habitat continuity is maintained within the wetland and between other habitat located off the site. Avoidance of segmentation and crossings also preserves water quality function by maintain existing flow patterns.



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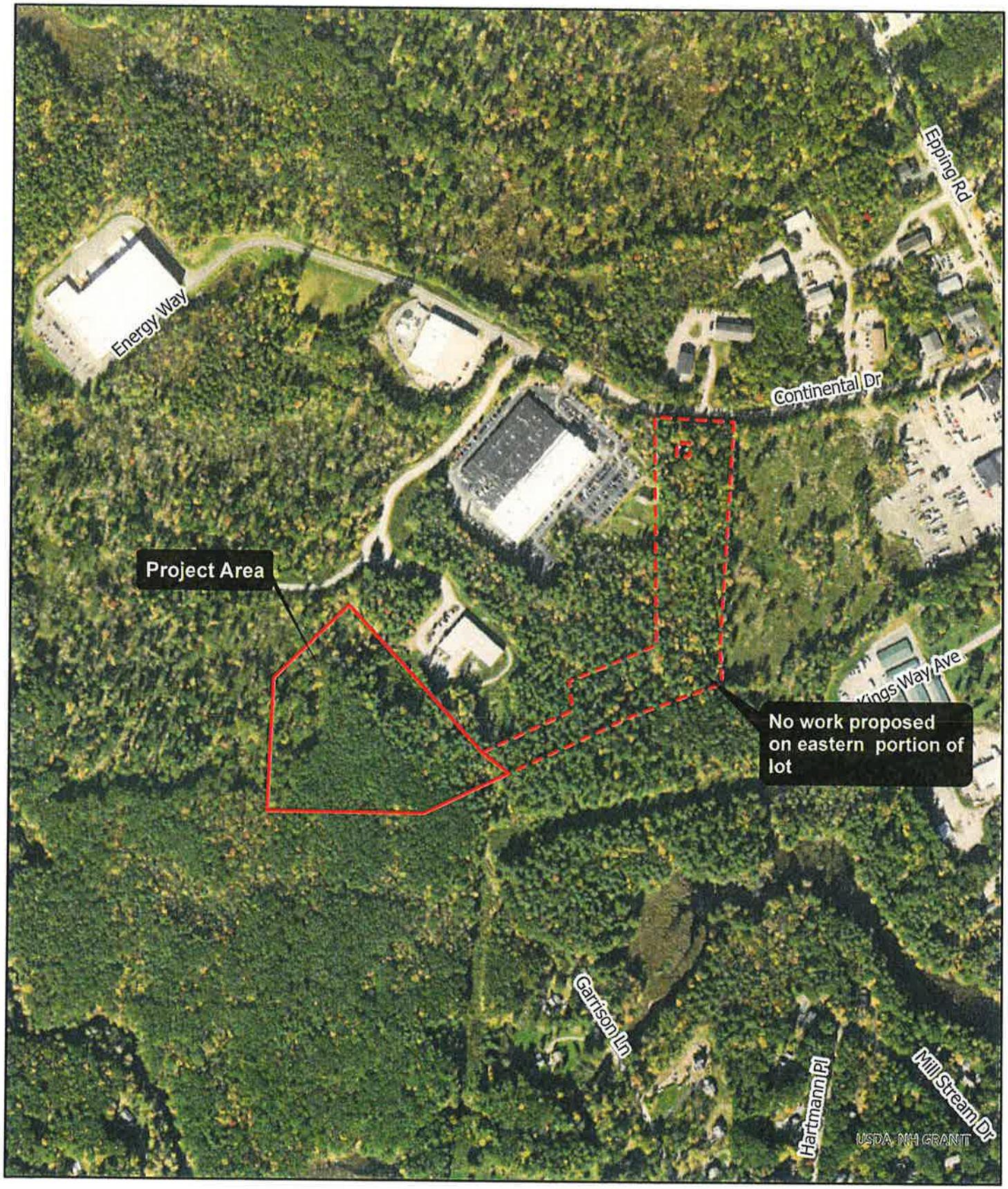
Locus Map

19 Continental Drive
Exeter, NH

Gove Environmental Services, Inc.
8 Continental Drive Bldg 2 Unit H Exeter NH 03833 603-778-0644



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2018 Aerial Photo

19 Continental Drive
Exeter, NH

Gove Environmental Services, Inc.
8 Continental Drive Bldg 2 Unit H Exeter NH 03833 603.778.0644

Your Organization

Legend

- Parcel Polygons
  - Parcel Polygons
  - Attributes for Additional Lines
- Parcel Lines
- Flood Plain Wetlands Adjacent
- Prime Wetlands with 100 ft Buf
- Prime Wetlands
- Designated Rivers
  - Subject to SWQPA
  - Not Subject to SWQPA
- Sand Dunes
  - backdune
  - foredune
  - interdune
  - other
- Tidal Waters / Tidal Wetlands
  - Tidal wetland
  - Transitional salt marsh
  - Salt marsh
  - Mud flat
  - Tidal water
- World Imagery
- Low Resolution 15m Imagery
- High Resolution 60cm Imagery
- High Resolution 30cm Imagery
- Citations

Notes

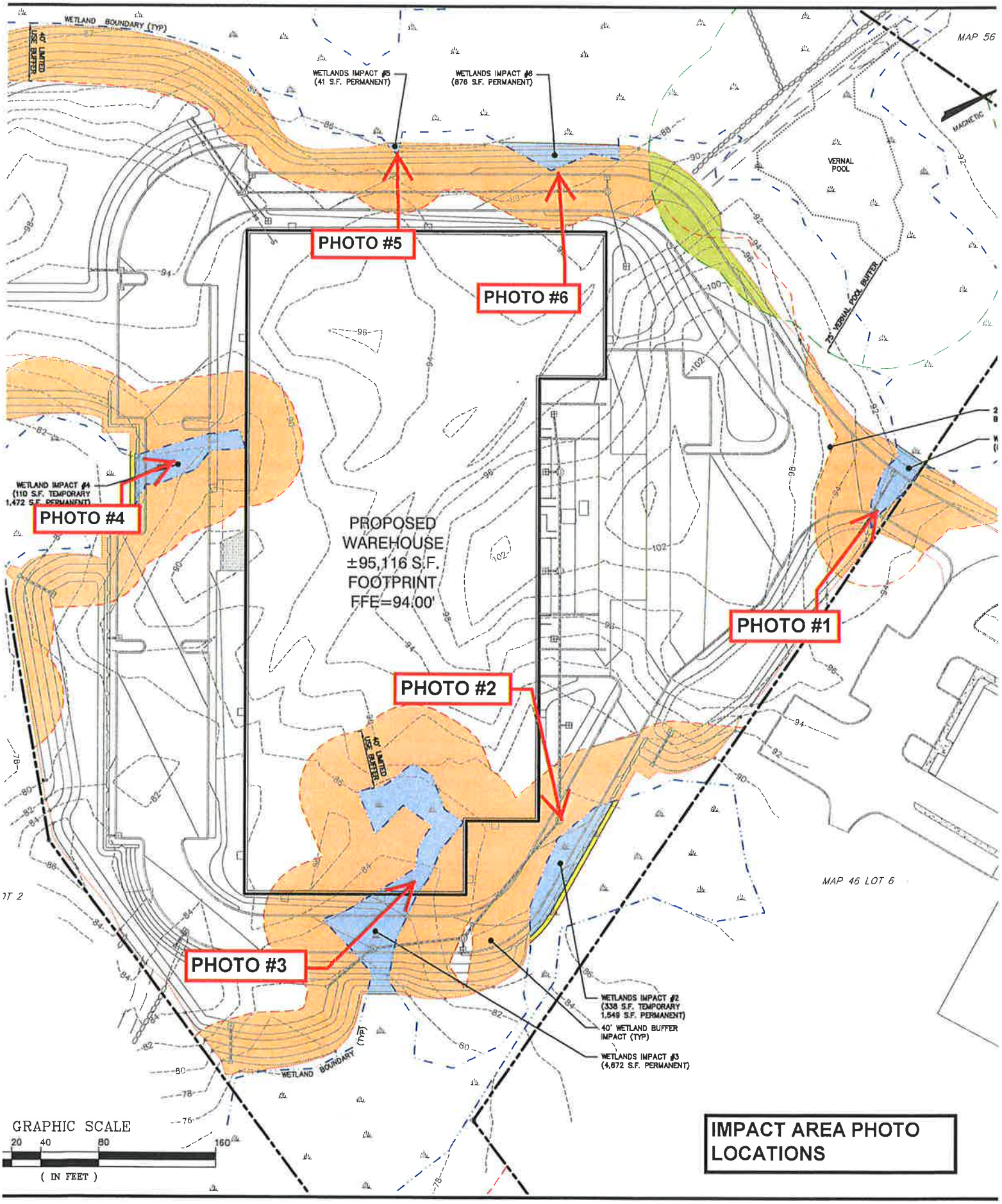
0.4 0 0.22 0.4 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Wetland Impact Overview


WETLAND BOUNDARY (TYP)
40' LIMITED USE BUFFER
WETLANDS IMPACT #5
(41 S.F. PERMANENT)
WETLANDS IMPACT #6
(876 S.F. PERMANENT)
MAP 56
MAGNETIC
VERNAL POOL
75' VERNAL POOL BUFFER
PHOTO #5
PHOTO #6
WETLAND IMPACT #4
(110 S.F. TEMPORARY
1,472 S.F. PERMANENT)
PHOTO #4
PROPOSED
WAREHOUSE
±95,116 S.F.
FOOTPRINT
FFE=94.00'
PHOTO #1
PHOTO #2
PHOTO #3
MAP 46 LOT 6
WETLANDS IMPACT #2
(338 S.F. TEMPORARY
1,549 S.F. PERMANENT)
40' WETLAND BUFFER
IMPACT (TYP)
WETLANDS IMPACT #3
(4,672 S.F. PERMANENT)
WETLAND BOUNDARY (TYP)
GRAPHIC SCALE
20 40 80 160
(IN FEET)
IMPACT AREA PHOTO
LOCATIONS

Impact Area 1

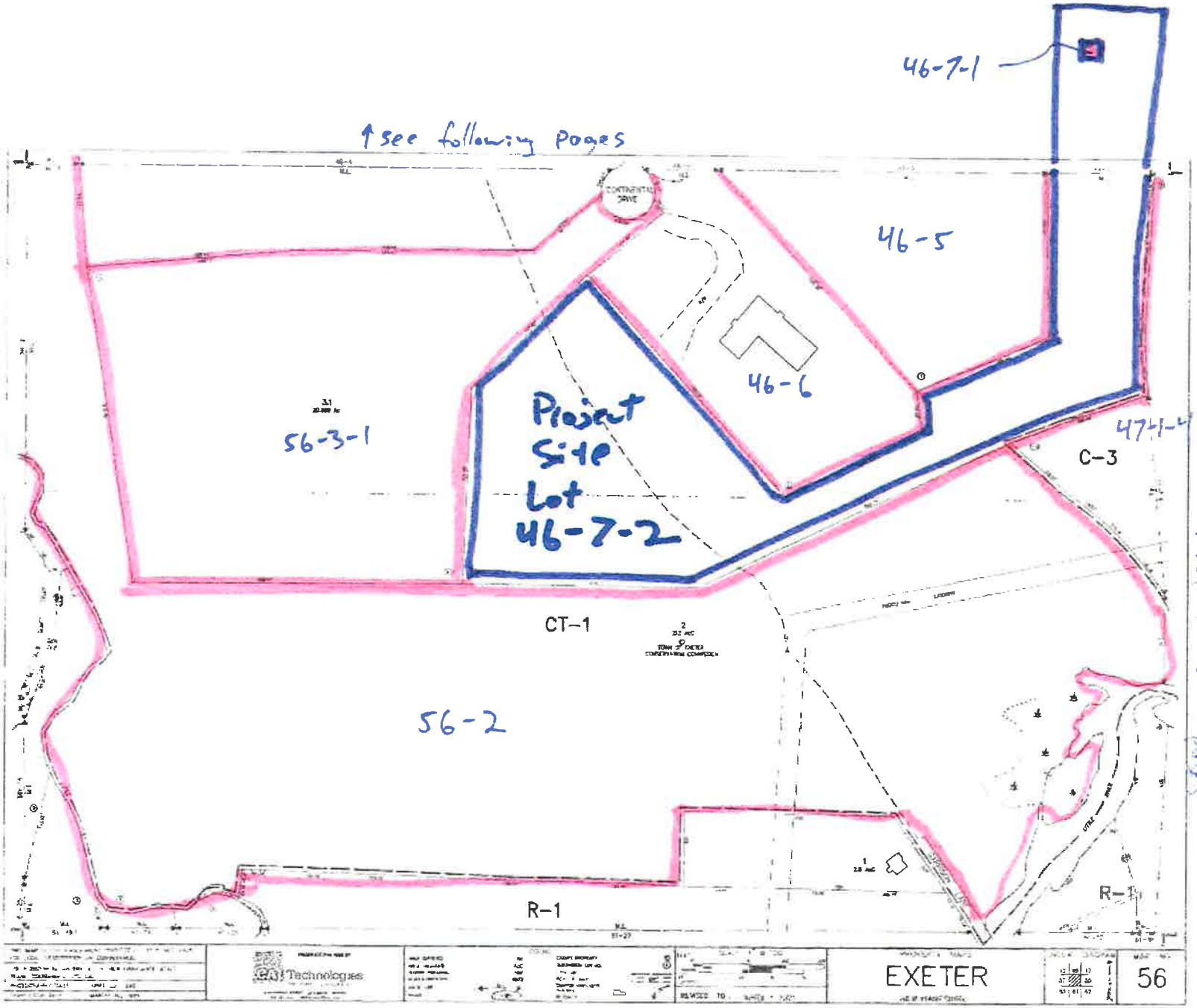
Impact Area 2

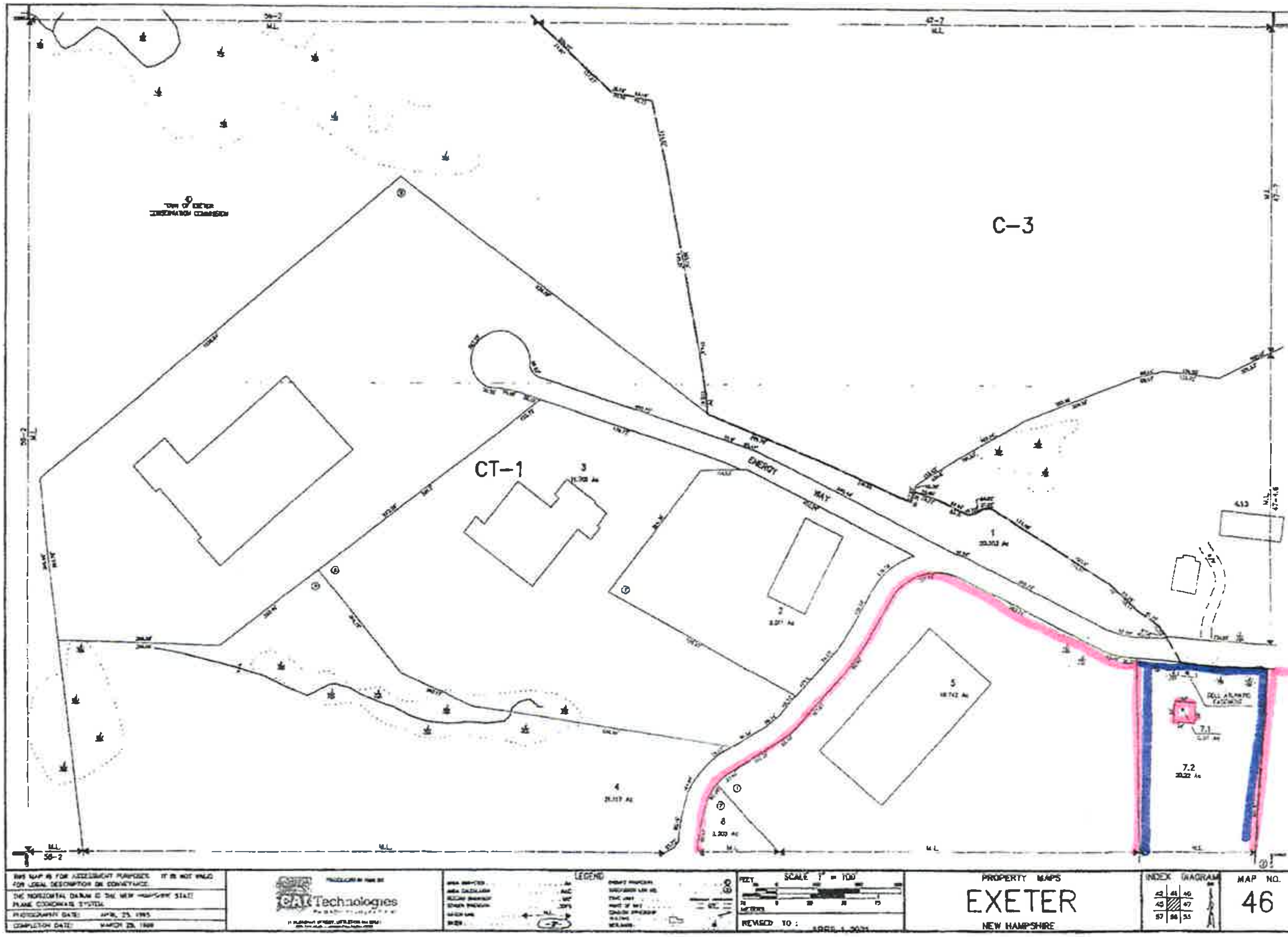
Impact Area 3

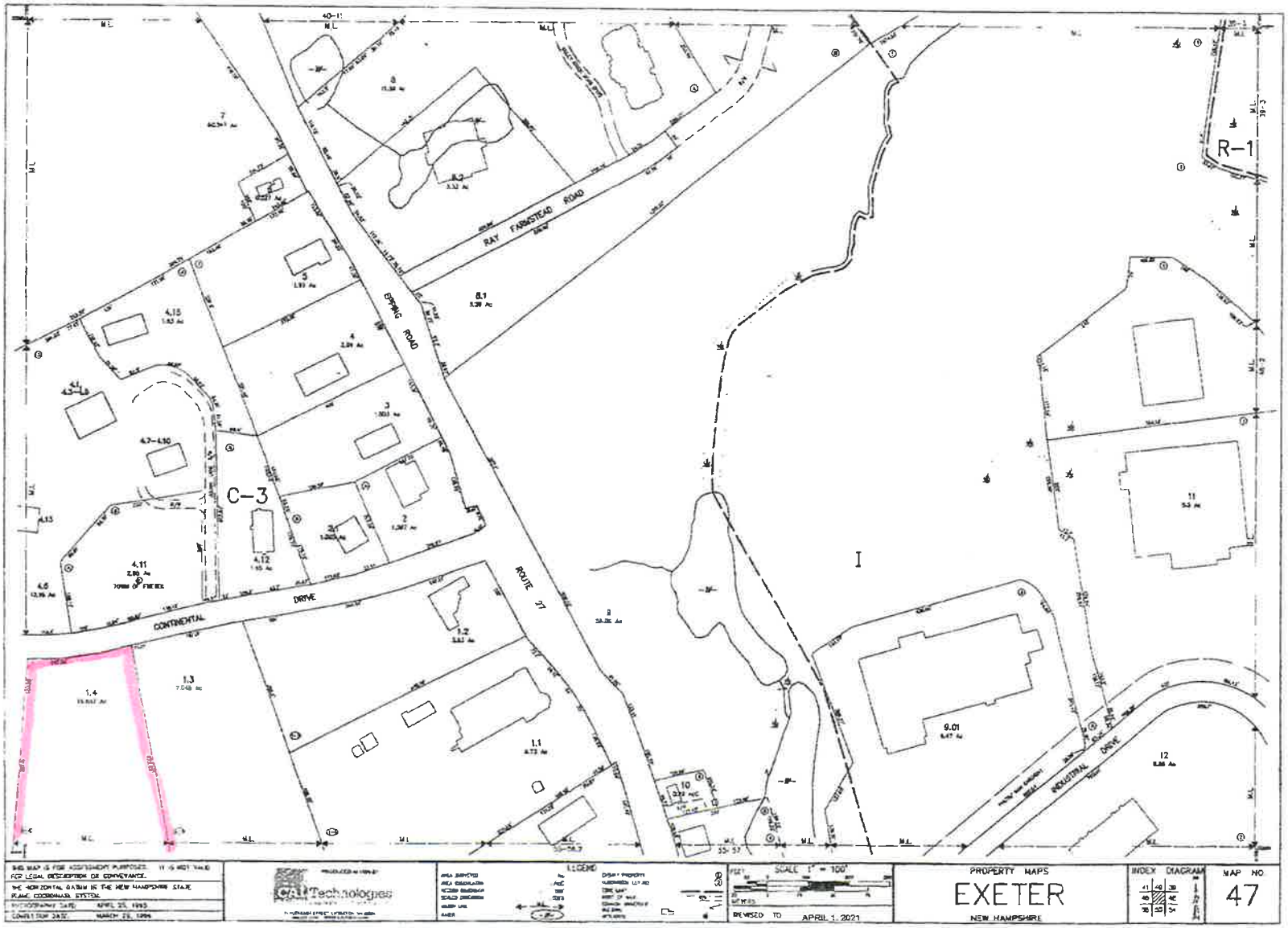
Impact Area 4

Impact Area 5

Impact Area 6


46-7-1
↑ see following pages
46-5
46-6
Project Site Lot 46-7-2
56-3-1
47-1-4
C-3
CT-1
56-2
R-1
R-1
↑ See following pages
Technologies
EXETER
56


C-3
CT-1
ENERGY
WAY
7.2
LEGEND
SCALE 1" = 100'
REVISED TO :
PROPERTY MAPS
EXETER
NEW HAMPSHIRE
INDEX DIAGRAM
MAP NO.
46


C-3
R-1
I
RAY FARMSTEAD ROAD
EPPING ROAD
ROUTE 27
CONTINENTAL DRIVE
INDUSTRIAL DRIVE
THIS MAP IS FOR ASSESSMENT PURPOSES. IT IS NOT VALID FOR LEGAL DESCRIPTION OR CONVEYANCE.
THE HORIZONTAL DATUM IS THE NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM.
PHOTOGRAPHY DATE: APRIL 25, 1995
CONSTRUCTION DATE: MARCH 25, 1996
LEGEND
SCALE 1" = 100'
REVISED TO APRIL 1, 2021
PROPERTY MAPS
EXETER
NEW HAMPSHIRE
INDEX DIAGRAM
MAP NO
47


I
C-3
R-4
75,200
CT-1
R-1
MS
C-2
R-4
EPPING ROAD
INDUSTRIAL DRIVE
ALLARD STREET
MICHAEL ANDRUS DRIVE
POND
COLCORD
COLCORD POND
LITTLE RIVER
HARTMANN PLACE
MILLSTREAM DRIVE
TOWN OF EXETER CONSERVATION LAND
LEGEND
SCALE 1" = 100
PROPERTY MAPS
EXETER
NEW HAMPSHIRE
INDEX DIAGRAM
MAP NO.
55

DIRECT ABUTTER LIST

SITE:

46-7-2	GLERUPS INC 27 Pleasant Street Newfields, NH 03856

ABUTTERS:

46-5	Continental Microwave, Inc. 11 Continental Drive Exeter, NH 03833
46-6	Perry Corporate Center 2094 Townline Road Madison, OH 44057
46-7-1	Holding Court, LLC C/O American Tower Corp 900 Circle 75 PKWY Suite 300 Atlanta, GA 30339
47-1-4	3-5 Continental Drive 156 Epping Road Exeter NH 03833
56-2	Town of Exeter 10 Front Street Exeter, NH 03833
56-3-1	Garrison Glen, LLC 20 Trafalga Sq, Suite 610 Nashua, NH

June 23, 2022

«Name»
«Street»
«TownStateZip»

Re: 19 Continental Drive
Map 46 Lot 7.2
Exeter, NH

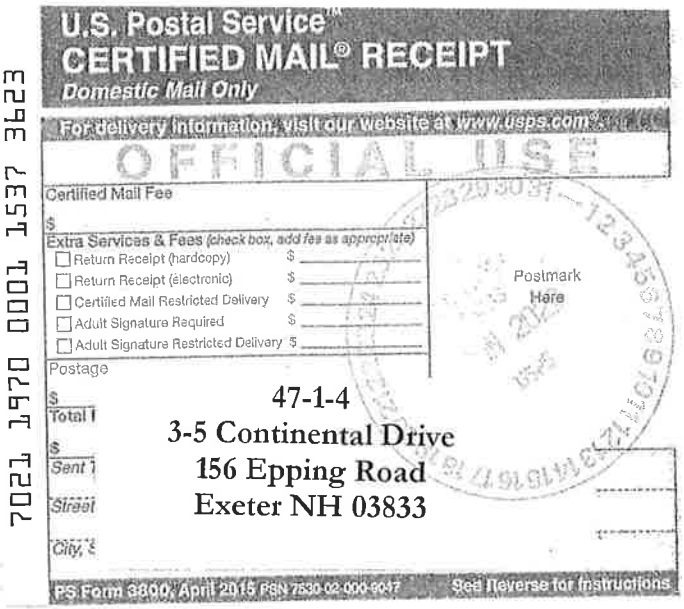
Dear Abutter:

The purpose of this letter is to inform you that GLERUPS, Inc has submitted a Dredge and Fill Application to the NH Department of Environmental Services for construction of a warehouse building located at 19 Continental Drive in Exeter, NH, Tax Map 46 Lot 7.2. DES requires this notice for work within a wetland area. After filing, a copy of the final Application, including plans, will be made available for your review at the Exeter Town Hall and at the NH Department of Environmental Services Wetlands Bureau, 29 Hazen Drive, in Concord.

If you have any questions that we might be able to answer, please feel free to contact our office.

Sincerely,

Brendan Quigley, CWS
Gove Environmental Services, Inc.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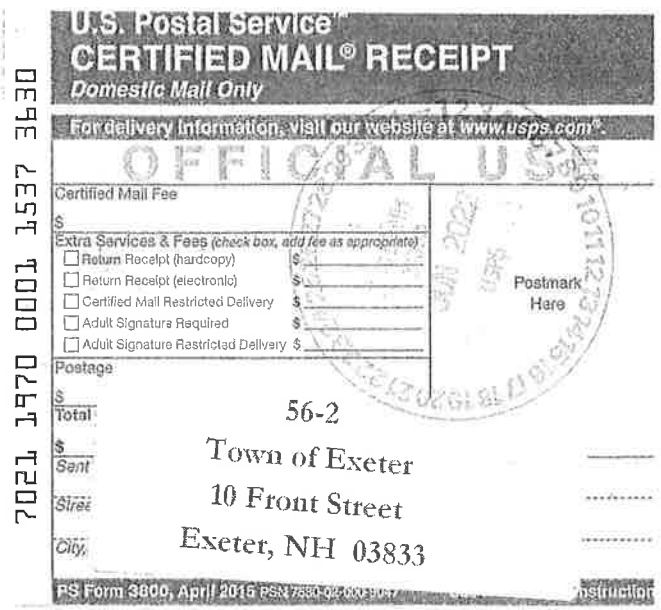
Adult Signature Restricted Delivery
Postage
Postmark Here
47-1-4
3-5 Continental Drive
156 Epping Road
Exeter NH 03833
PS Form 3800, April 2015 PSN 7530-02-000-9047
See Reverse for Instructions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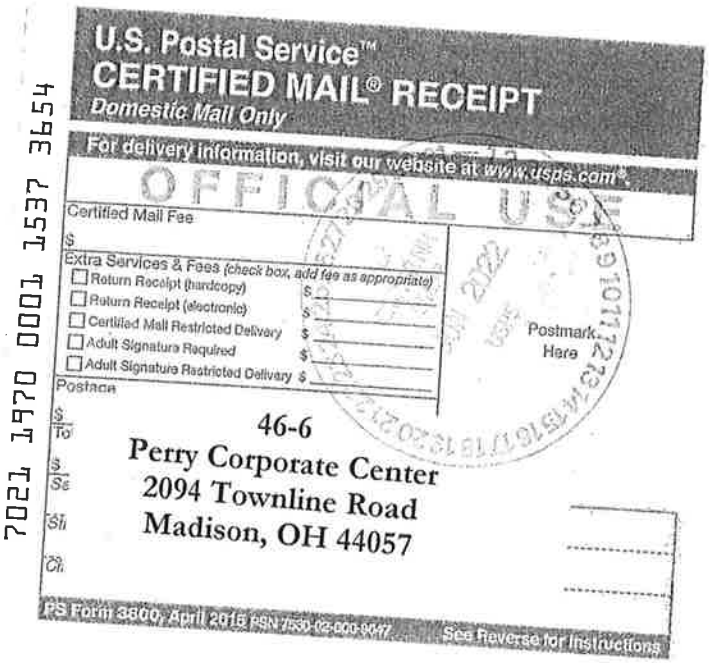
56-2
Town of Exeter
10 Front Street
Exeter, NH 03833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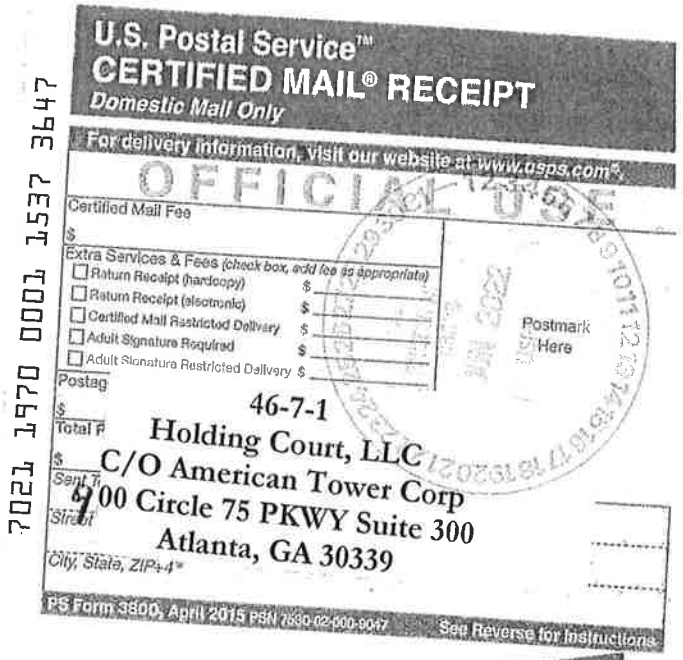
Adult Signature Restricted Delivery
Postmark Here
46-6
Perry Corporate Center
2094 Townline Road
Madison, OH 44057
PS Form 3800, April 2015 PSN 7530-02-000-9047
See Reverse for Instructions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Adult Signature Restricted Delivery
Postmark Here
46-7-1
Holding Court, LLC
C/O American Tower Corp
700 Circle 75 PKWY Suite 300
Atlanta, GA 30339
City, State, ZIP+4®
PS Form 3800, April 2015 PSN 7530-02-000-9047
See Reverse for Instructions


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Return Receipt (electronic)
Certified Mail Restricted Delivery
Adult Signature Required
Adult Signature Restricted Delivery
Postmark Here
56-5
Continental Microwave, Inc.
11 Continental Drive
Exeter, NH 03833
PS Form 3800, April 2015 PSN 7530-02-000-9047
See Reverse for Instructions


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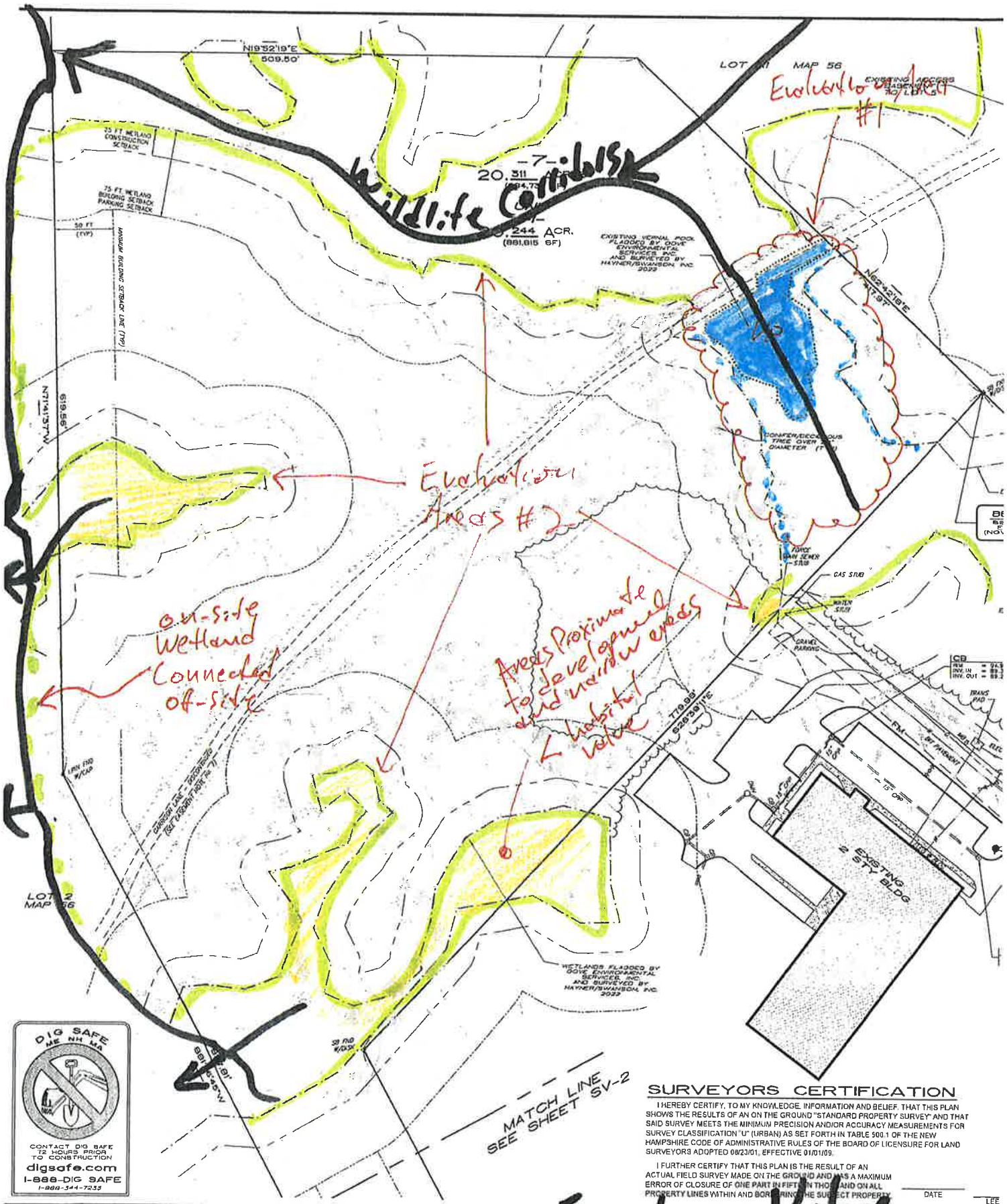
Return Receipt (electronic)
Certified Mail Restricted Delivery
Adult Signature Required
Postmark Here
56-3-1
Garrison Glen, LLC
20 Trafalga Sq, Suite 610
Nashua, NH
City, State, ZIP+4®
PS Form 3800, April 2015 PSN 7530-02-000-9047
See Reverse for Instructions



SURVEYORS CERTIFICATION

I HEREBY CERTIFY, TO MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THIS PLAN SHOWS THE RESULTS OF AN ON THE GROUND "STANDARD PROPERTY SURVEY" AND THAT SAID SURVEY MEETS THE MINIMUM PRECISION AND/OR ACCURACY MEASUREMENTS FOR SURVEY CLASSIFICATION "U" (URBAN) AS SET FORTH IN TABLE 500.1 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS ADOPTED 08/23/01, EFFECTIVE 01/01/09.

I FURTHER CERTIFY THAT THIS PLAN IS THE RESULT OF AN ACTUAL FIELD SURVEY MADE ON THE GROUND AND HAS A MAXIMUM ERROR OF CLOSURE OF ONE PART IN FIFTEEN THOUSAND ON ALL PROPERTY LINES WITHIN AND BORDERING THE SUBJECT PROPERTY.

DATE

LEE

Function + Value Sketch

Wetland Function-Value Evaluation Form

Total area of wetland ~26,000 SF Human made? no Is wetland part of a wildlife corridor? YES or a "habitat island"? NO

Adjacent land use Industrial Development and Roadway Distance to nearest roadway or other development <10'

Dominant wetland systems present PFO1E/PSS1 Contiguous undeveloped buffer zone present NO

Is the wetland a separate hydraulic system? NO If not, where does the wetland lie in the drainage basin? HIGH

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Eval Area 1 (Vernal Pool)

Latitude see sketch Longitude and plans

Prepared by: BJQ Date 4/5/22

Wetland Impact:
Type buffer Area

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N	6		signs of bedrock and low permeability soils
Floodflow Alteration	Y	2,3,7,9,15		basin shape of VP provides some storage, minimal in overall wetland
Fish and Shellfish Habitat	N			ephemeral surface water
Sediment/Toxicant Retention	Y	1,3,4,7		receives runoff from surrounding devel. difuse flow to little river
Nutrient Removal	Y	3,4,7,8,9		receives runoff from surrounding devel. difuse flow to little river
Production Export	Y	1,4,7,12	X	wildlife food sources,dense berry prod. shrubs
Sediment/Shoreline Stabilization	N			not associated with surface water
Wildlife Habitat	Y	7,8,13,16,17,18,20	X	confirmed vernal pool
Recreation	N	4		low aesthetic value and diversity, lacks surface water, rec. largely unrelated to wetland
Educational/Scientific Value	Y	5		limited value for VP study, private, limited diversity
Uniqueness/Heritage	N			adj developed areas, forested wetland only
Visual Quality/Aesthetics	N			adj developed areas, forested wetland only
ES Endangered Species Habitat	N			none identified
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland ~ 3 ac Human made? no Is wetland part of a wildlife corridor? YES or a "habitat island"? NO

Adjacent land use Industrial Development and Roadway Distance to nearest roadway or other development <10'

Dominant wetland systems present PFO1E Contiguous undeveloped buffer zone present NO

Is the wetland a separate hydraulic system? NO If not, where does the wetland lie in the drainage basin? HIGH

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Eval Area 2 (other wetland on site)

Latitude see sketch Longitude and plans

Prepared by: BJQ Date 4/5/22

Wetland Impact:
Type Fill Area 9,452

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N	6		signs of bedrock and low permeability soils
Floodflow Alteration	Y	2,3,7,9,15		not directly assoc. with waterway (floodplain), minimal storage overall in wetland
Fish and Shellfish Habitat	N			no surface water
Sediment/Toxicant Retention	Y	1,3,4,7	X	receives runoff from surrounding devel. difuse flow to little river
Nutrient Removal	Y	3,4,7,8,9	X	receives runoff from surrounding devel. difuse flow to little river
Production Export	Y	1,4,7,12	X	wildlife food sources,berry prod. shrubs, oak
Sediment/Shoreline Stabilization	N			not associated with surface water
Wildlife Habitat	Y	4,8,10,11		concentrated in wildlife passage areas (see sketch) and interior of wetland
Recreation	N	4		low aesthetic value and diversity, lacks surface water, rec. largely unrelated to wetland
Educational/Scientific Value	Y			private, limited diversity
Uniqueness/Heritage	N			adj developed areas, forested wetland only
Visual Quality/Aesthetics	N			adj developed areas, forested wetland only
ES Endangered Species Habitat	N			none identified
Other				

Notes:

* Refer to backup list of numbered considerations.

US Army Corps of Engineers
New England District

New Hampshire General Permits (GPs)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to "work" include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 5, regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*	X	
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?		X
2.2 Are there proposed impacts to SAS, special wetlands. Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www2.des.state.nh.us/nhb_datacheck/. The book Natural Community Systems of New Hampshire also contains specific information about the natural communities found in NH.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	NO Crossings	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)		X
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?	0	
2.7 What is the area of the proposed fill in wetlands?	9,452 SF	
2.8 What is the % of previously and proposed fill in wetlands to the overall project site?	approx 1%	
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www2.des.state.nh.us/nhb_datacheck/ USFWS IPAC website: https://ecos.fws.gov/ipac/location/index NLEB, SWP	X	

3.2 Would work occur in any area identified as either "Highest Ranked Habitat in N.H." or "Highest Ranked Habitat in Ecological Region"? (These areas are colored magenta and green, respectively, on NH Fish and Game's map, "2010 Highest Ranked Wildlife Habitat by Ecological Condition.") Map information can be found at: • PDF: https://wildlife.state.nh.us/wildlife/wap-high-rank.html. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html.	X	
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?	X	
3.5 Are stream crossings designed in accordance with the GC 21?		
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?		X
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?	N/A	
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document**	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.
** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

Please mail the completed form and required material to:

New Hampshire Division of Historical Resources
State Historic Preservation Office
Attention: Review & Compliance
19 Pillsbury Street, Concord, NH 03301-3570

RECEIVED FEB 28 2022

DHR Use Only	
R&C #	13561
Log In Date	2/28/22
Response Date	4/26/22
Sent Date	4/29/22

Request for Project Review by the New Hampshire Division of Historical Resources

☒ This is a new submittal
☐ This is additional information relating to DHR Review & Compliance (R&C) #:

GENERAL PROJECT INFORMATION

Project Title 19 Continental Drive

Project Location 19 Continental Drive

City/Town Exeter Tax Map 46 Lot # 7.2

NH State Plane - Feet Geographic Coordinates: Easting 1167491 Northing 179743
(See RPR Instructions and R&C FAQs for guidance.)

Lead Federal Agency and Contact *(if applicable)* ACOE
(Agency providing funds, licenses, or permits)
Permit Type and Permit or Job Reference # GP

State Agency and Contact *(if applicable)* NHDES

Permit Type and Permit or Job Reference # Dredge & Fill

APPLICANT INFORMATION

Applicant Name GLERUPS INC

Mailing Address PO BOX 884 Phone Number

City Durham State NH Zip 038924 Email

CONTACT PERSON TO RECEIVE RESPONSE

Name/Company Brendan Quigley

Mailing Address 8 Continental Drive Bldg2 Unit H Phone Number 6036860086

City Exeter State NH Zip 03833 Email bquigley@gesinc.biz

This form is updated periodically. Please download the current form at www.nh.gov/nhdhr/review. *Please refer to the Request for Project Review Instructions for direction on completing this form.* Submit one copy of this project review form for each project for which review is requested. **Please include a self-addressed stamped envelope. Project submissions will not be accepted via facsimile or e-mail.** This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and supporting documentation submitted with a review request, including photographs and publications, will be retained by the DHR as part of its review records. Items to be kept confidential should be clearly identified. For questions regarding the DHR review process and the DHR's role in it, please visit our website at: www.nh.gov/nhdhr/review or contact the R&C Specialist at marika.s.labash@dncr.nh.gov or 603.271.3558.

PROJECTS CANNOT BE PROCESSED WITHOUT THIS INFORMATION 13561

Project Boundaries and Description

- ☐ Attach the Project Mapping ***using EMMIT or relevant portion of a 7.5' USGS Map.*** *(See RPR Instructions and R&C FAQs for guidance.)*
- ☐ Attach a detailed narrative description of the proposed project.
- ☐ Attach a site plan. The site plan should include the project boundaries and areas of proposed excavation.
- ☐ Attach photos of the project area (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) *(Informative photo captions are requested.)*
- ☐ A DHR records search must be conducted to identify properties within or adjacent to the project area. Provide records search results via EMMIT or in **Table 1**. *(Blank table forms are available on the DHR website.)*
  EMMIT or in-house records search conducted on / / .

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts or landscapes within the project area? ☐ Yes ☐ No
If no, skip to Archaeology section. If yes, submit all of the following information:

Approximate age(s):

- ☐ Photographs of ***each*** resource or streetscape located within the project area, with captions, along with a mapped photo key. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)
- ☐ If the project involves rehabilitation, demolition, additions, or alterations to existing buildings or structures, provide additional photographs showing detailed project work locations. (i.e. Detail photo of windows if window replacement is proposed.)

Archaeology

Does the proposed undertaking involve ground-disturbing activity? ☐ Yes ☐ No
If yes, submit all of the following information:

- ☐ Description of current and previous land use and disturbances.
- ☐ Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

Please note that for many projects an architectural and/or archaeological survey or other additional information may be needed to complete the Section 106 process.

DHR Comment/Finding Recommendation *This Space for Division of Historical Resources Use Only*

☐ Insufficient information to initiate review. ☐ Additional information is needed in order to complete review.

☐ No Potential to cause Effects ☑ No Historic Properties Affected ☐ No Adverse Effect ☐ Adverse Effect

Comments: PROJECT AREA SURVEYED AT I-A LEVEL IN 2016 UNDER RAP # 7181. CONCUR WITH RESULTS AND RECOMMENDATION OF NO FURTHER STUDY.

If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation.

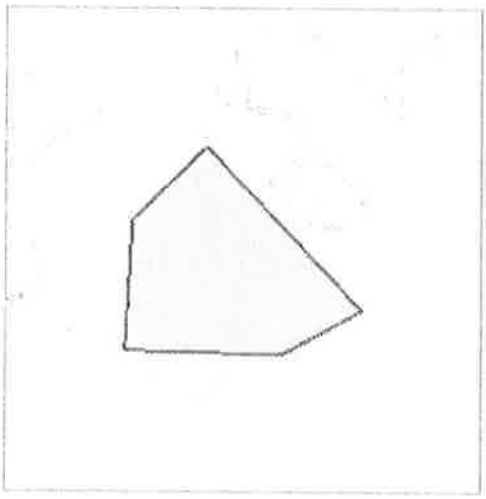
Authorized Signature: Nadine Miller, DSHPO Date: 4/26/22

Project Summary

Project Code: 2022-0035405
Event Code: None
Project Name: 19 Continental Dr. Warehouse
Project Type: Commercial Development
Project Description: The project involves construction of a 41,000 SF, multi tenant warehouse and light manufacturing building on a currently vacant lot within the Garrison Glen Industrial Park.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.99118489999999,-70.98161178893633,14z



Counties: Rockingham County, New Hampshire

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency:	Gove Environmental Services Inc
Name:	Brendan Quigley
Address:	8 Contintental Drive
Address Line 2:	Bldg 2 Unit H
City:	Exeter
State:	NH
Zip:	03833
Email	bquigley@gesinc.biz
Phone:	6037780644

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Project code: 2022-0035405
Project Name: 19 Continental Dr. Warehouse

April 25, 2022

Subject: Verification letter for the '19 Continental Dr. Warehouse' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Brendan Quigley:

The U.S. Fish and Wildlife Service (Service) received on April 25, 2022 your effects determination for the '19 Continental Dr. Warehouse' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

This IPaC-assisted determination allows you to rely on the PBO for compliance with ESA Section 7(a)(2) only for the northern long-eared bat. It **does not** apply to the following ESA-protected species that also may occur in the Action area:

- Monarch Butterfly *Danaus plexippus* Candidate
- Small Whorled Pogonia *Isotria medeoloides* Threatened

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

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[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

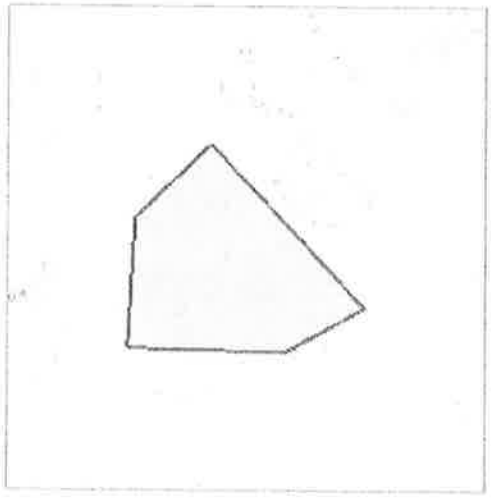
19 Continental Dr. Warehouse

2. Description

The following description was provided for the project '19 Continental Dr. Warehouse':

> The project involves construction of a 41,000 SF, multi tenant warehouse and light manufacturing building on a currently vacant lot within the Garrison Glen Industrial Park.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.99118489999999,-70.98161178893633,14z



Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require

ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

6. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

7. Will the action involve Tree Removal?

   Yes

8. Will the action only remove hazardous trees for the protection of human life or property?

   No

9. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

10. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

    No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

5

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

IPaC User Contact Information

Agency:	Gove Environmental Services Inc
Name:	Brendan Quigley
Address:	8 Contintental Drive
Address Line 2:	Bldg 2 Unit H
City:	Exeter
State:	NH
Zip:	03833
Email	bquigley@gesinc.biz
Phone:	6037780644

Lead Agency Contact Information

Lead Agency: Army Corps of Engineers

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

To: Luke Hurley, Gove Environmental Services, Inc.
8 Continental Drive
Exeter, NH 03833

From: NHB Review, NH Natural Heritage Bureau
Date: 2/24/2022 (valid until 02/24/2023)
Re: Review by NH Natural Heritage Bureau
Permits: MUNICIPAL POR - exeter, NHDES - Alteration of Terrain Permit, NHDES - Wetland Standard Dredge & Fill - Major, USACE - General Permit, USEPA - Stormwater Pollution Prevention

NHB ID: **NHB22-0691** Town: exetetr Location: 19 continental dr
Description: Industrial/Commercial development involving approximately 10,000 SF of wetland impact.
cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments **NHB: No Comments At This Time**
F&G: As of February 3, 2022, New Hampshire Fish and Game requirements for environmental review consultation have changed. To review the new rules, please go to https://www.wildlife.state.nh.us/legislative/proposed-rules.html. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail. The NHB datacheck results letter number needs to be included in the email subject line.

The requirements for consultation (Fis 1004) shall not apply to the following: statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule. Consultation requests for these projects can be sent directly to kim.tuttle@wildlife.nh.gov.

Vertebrate species	State[1]	Federal	Notes
Northern Black Racer (*Coluber constrictor constrictor*)	T	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle (*Glyptemys insculpta*)	SC	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

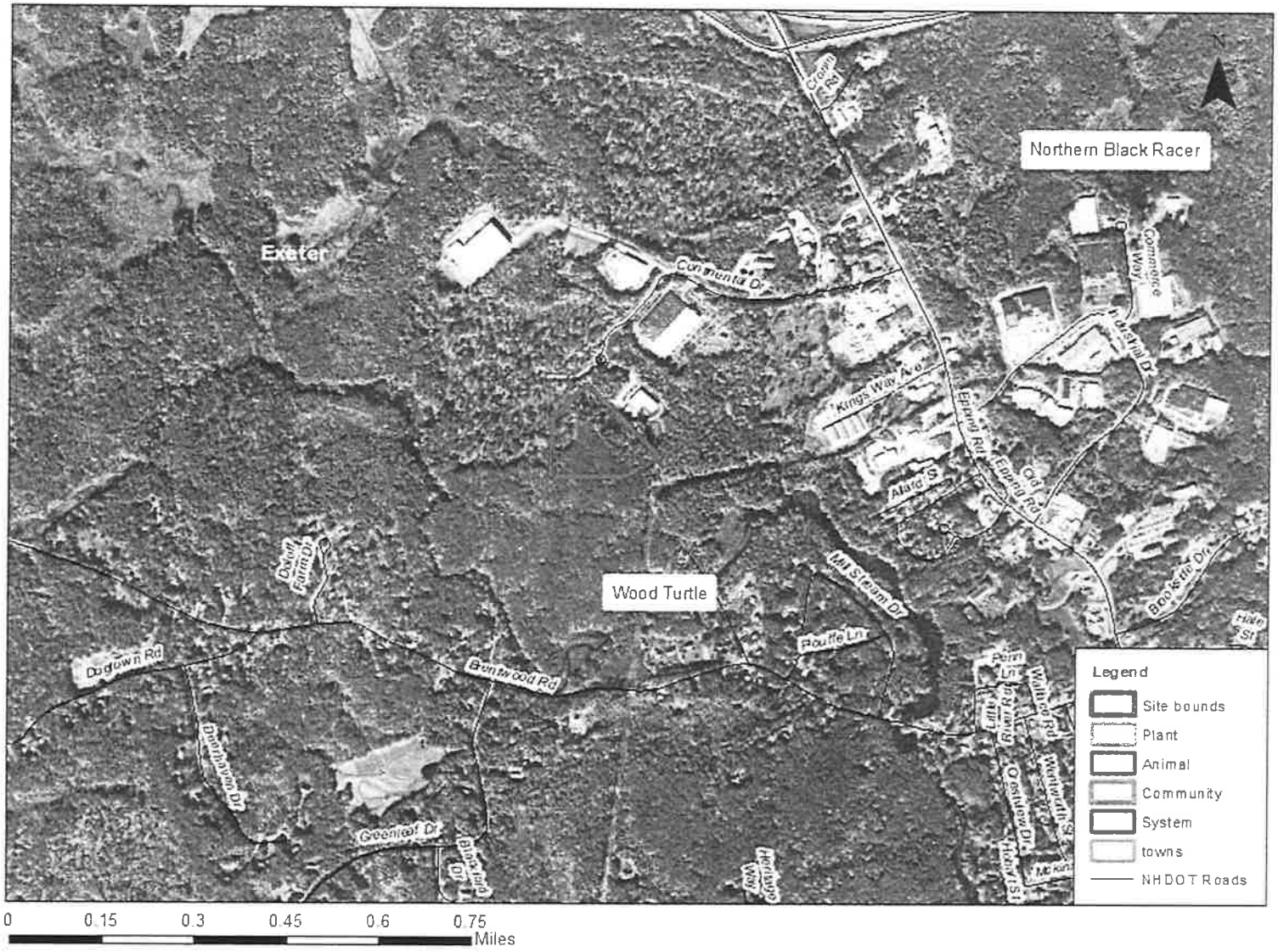
A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

NHB22-0691



TOWN OF EXETER

Planning and Building Department

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709

www.exeternh.gov

Date: **August 31, 2022**

To: **Planning Board**

From: **Dave Sharples, Town Planner**

Re: **Phillips Exeter Academy** **PB Case #22-12**

The Applicant is seeking site plan approval for the proposed reconstruction of the Wetherell Dining Hall on Spring Street, the renovation of the attached Langdell and Merrill dormitories and associated site improvements. The subject property is located in the R-2, Single Family Residential zoning district and is identified as Tax Map Parcel #72-208.

The Applicant has submitted a site plan review application, plans and supporting documents, dated July 12, 2022 for review. A Technical Review Committee (TRC) meeting was conducted on August 4, 2022. A copy of the TRC comment letter, dated August 11, 2022 and UEI comment letter, dated August 11, 2022 are also enclosed for your review.

Revised plans and supporting documents were received on August 30th, 2022 and are enclosed for your review. Staff is in the process of reviewing this submission to determine if all the TRC comments have been addressed and I will update the board at the meeting.

The Applicant is requesting a waiver from the requirement to provide a High Intensity Soils Survey as the entire site is a previously disturbed area and there is limited site work outside the building footprint.

In the event the board chooses to hold a site walk, I will ask the applicant to mark out the important features of the site. I will be prepared with suggested conditions of approval at the meeting in the event the board decides to act on the request and forego a site walk.

Waiver Motion:

High Intensity Soils Survey (HISS) waiver motion: After reviewing the criteria for granting waivers, I move that the request of Phillip Exeter Academy (PB Case#22-12) for a waiver from Section 7.4.10 of the Site Plan Review and Subdivision Regulations to provide High Intensity Soil Survey information be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Planning Board Motion:

Site Plan Motion: I move that the request of Phillips Exeter Academy (PB Case #22-12) for Site Plan approval be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Thank You.

Enclosures

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

July 11, 2022

Town of Exeter
Planning Board / Technical Review Committee
10 Front Street
Exeter, NH 03833

RE: Application for Site Plan Review (Case #2022-12)
Wetherell, Merrill, & Langdell Replacement and Renovation
Tax Map 72, Lot 208
Altus Project P5146

Dear Board and Committee Members,

On behalf of Phillips Exeter Academy (Academy), Altus Engineering, Inc. (Altus) is pleased to submit the attached Application for Site Plan Review to replace Wetherell Dining Hall and renovate Merrill and Langdell Hall. The Academy is proposing to raze the existing Wetherell Dining Hall to construct a new dining hall to meet the campus needs and renovate both Merrill Hall and Langdell Hall to provide updated student and faculty housing that meets current building codes. Wetherell Dining Hall is located between and connected to Merrill and Langdell Halls, which are located at corner of Spring Street and Main Street. The property is identified on the Exeter Assessors Map as Tax Map 72-Lot 208 in the Residential (R-2) zoning district and is approximately 11.4 acres in size. There fifteen institutional buildings located on the lot including the Academy Building, Jeremiah Smith Hall (Administration Building), and multiple academic and dormitory buildings. The property is bound by Front Street to the south, Tan Lane to the west, Main Street to the north, and Spring Street to the east.

Included in the application materials, please find the following: Five (5) copies of the full size plans and supporting material for the Technical Review Committee review on August 4, 2022.

1. Site Review Application, Checklists, and Fee
2. Abutter List and Mailing labels
3. Letter of Explanation
4. Site Cost Estimate
5. Waiver Request
6. USGS, Aerial, and FEMA Site Maps
7. Drainage Report
8. Stormwater Inspection and Maintenance Manual
9. Vehicle Turning Templates
10. Project Plans (24” x 36”)

If you have any questions, please do not hesitate to contact us.

Sincerely,

Cory D. Belden, PE

ECopy: Mark Leighton / Heather Taylor, Phillips Exeter Academy
George De Brigard, Robert A.M. Architects, LLP
Enclosures

TOWN OF EXETER, NH
APPLICATION FOR SITE PLAN REVIEW

THIS IS AN APPLICATION FOR:

( ) COMMERCIAL SITE PLAN REVIEW
( ) INDUSTRIAL SITE PLAN REVIEW
( ) MULTI-FAMILY SITE PLAN REVIEW
( ) MINOR SITE PLAN REVIEW
(X) INSTITUTIONAL/NON-PROFIT SPR

OFFICE USE ONLY

_____ APPLICATION #
_____ DATE RECEIVED
_____ APPLICATION FEE
_____ PLAN REVIEW FEE
_____ ABUTTERS FEE
_____ LEGAL NOTICE FEE
_____ TOTAL FEES

_____ INSPECTION FEE
_____ INSPECTION COST
_____ REFUND (IF ANY)

1. **NAME OF LEGAL OWNER OF RECORD:** Phillips Exeter Academy

TELEPHONE: ( ) 603 777-3292

ADDRESS: 20 Main Street, Exeter, NH 03833

2. **NAME OF APPLICANT:** Same as above

ADDRESS: _____

TELEPHONE: ( ) _____

3. **RELATIONSHIP OF APPLICANT TO PROPERTY IF OTHER THAN OWNER:** _____

(Written permission from Owner is required, please attach.)

4. **DESCRIPTION OF PROPERTY:** Private Institution - Educational Facility

ADDRESS: 20-24 Spring Street,Exeter, NH 03833

TAX MAP: 72 **PARCEL #:** 208 **ZONING DISTRICT:** R-2

AREA OF ENTIRE TRACT: 11.4 acres **PORTION BEING DEVELOPED:** 0.7acres

5. **ESTIMATED TOTAL SITE DEVELOPMENT COST $** $324,000 (Site Work Only)

6. **EXPLANATION OF PROPOSAL:** The project will construct a new dining hall in the location of the existing Wetherell Dining Hall and renovate the attached Langdell and Merrill Dormitories. See #11 below

7. **ARE MUNICIPAL SERVICES AVAILABLE?** (YES/NO) Yes. Municipal service are available

If yes, Water and Sewer Superintendent must grant written approval for connection.
If no, septic system must comply with W.S.P.C.C. requirements.

8. **LIST ALL MAPS, PLANS AND OTHER ACCOMPANYING MATERIAL SUBMITTED WITH THIS APPLICATION:**

ITEM:	NUMBER OF COPIES
A. Application, Checklists, & Fee	5 copies
B. Abutter List and Mailing Labels	5 copies
C. Site Cost Estimate	5 copies
D. Waiver Request	5 copies
E. Drainage Report /Stormwater Manual	5 Copies
F. Truck Turning Templates	5 copies
Site Review Plans	5 Full Size

9. **ANY DEED RESTRICTIONS AND COVENANTS THAT APPLY OR ARE CONTEMPLATED** (YES/NO) No IF YES, ATTACH COPY.

10. **NAME AND PROFESSION OF PERSON DESIGNING PLAN:**

NAME: Cory D. Belden, PE

ADDRESS: 133 Court Street, Portsmouth, NH 03801

PROFESSION: Civil Engineer **TELEPHONE:** (603) 433-2335

11. **LIST ALL IMPROVEMENTS AND UTILITIES TO BE INSTALLED:**

The proposed project will raze the existing Wetherell Dining Hall, located between and connected to the Langdell and Merrill Dormitories. A new dining hall will be constructed in its place and the two dormitories will be renovated to current standards. Associated site improvements will be provided for access, truck loading, and utilities. A new sub-surface stormwater gallery will be installed in Ford Quad to provide stormwater treatment. Existing sewer and water service connections will be maintained. The Building will be serviced by geo-thermal wells located in the Academy Lawn to the southwest.

12. **HAVE ANY SPECIAL EXCEPTIONS OR VARIANCES BEEN GRANTED BY THE ZONING BOARD OF ADJUSTMENT TO THIS PROPERTY PREVIOUSLY?**

IF YES, DESCRIBE BELOW. (Please check with the Planning Department Office to verify)

None known.

13. **WILL THE PROPOSED PROJECT INVOLVE DEMOLITION OF ANY EXISTING BUILDINGS OR APPURTENANCES?** IF YES, DESCRIBE BELOW.
(Please note that any proposed demolition may require review by the Exeter Heritage Commission in accordance with Article 5, Section 5.3.5 of the Exeter Zoning Ordinance).

Yes. The proposed project will demolish the existing Wetherell Dining Hall building. The existing Merrill and Langdell Dormitories will be renovated, but will maintain the existing building.

14. **WILL THE PROPOSED PROJECT REQUIRE A "NOTICE OF INTENT TO EXCAVATE" (State of NH Form PA-38)? IF YES, DESCRIBE BELOW.**

No.

NOTICE: I CERTIFY THAT THIS APPLICATION AND THE ACCOMPANYING PLANS AND SUPPORTING INFORMATION HAVE BEEN PREPARED IN CONFORMANCE WITH ALL APPLICABLE REGULATIONS; INCLUDING BUT NOT LIMITED TO THE "SITE PLAN REVIEW AND SUBDIVISION REGULATIONS" AND THE ZONING ORDINANCE. FURTHERMORE, IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 15.2 OF THE "SITE PLAN REVIEW AND SUBDIVISION REGULATIONS", I AGREE TO PAY ALL COSTS ASSOCIATED WITH THE REVIEW OF THIS APPLICATION.

DATE 07/11/2022 OWNER'S SIGNATURE

ACCORDING TO RSA 676.4.I (c), THE PLANNING BOARD MUST DETERMINE WHETHER THE APPLICATION IS COMPLETE WITHIN 30 DAYS OF SUBMISSION. THE PLANNING BOARD MUST ACT TO APPROVE, CONDITIONALLY APPROVE, OR DENY AN APPLICATION WITHIN SIXTY FIVE (65) DAYS OF ITS ACCEPTANCE BY THE BOARD AS A COMPLETE APPLICATION. A SEPARATE FORM ALLOWING AN EXTENSION OR WAIVER TO THIS REQUIREMENT MAY BE SUBMITTED BY THE APPLICANT.

SITE PLAN REVIEW APPLICATION CHECKLIST

A COMPLETED APPLICATION FOR SITE PLAN REVIEW MUST CONTAIN THE FOLLOWING

1. Application for Hearing (X)

2. Abutter's List Keyed to Tax Map (X)
   (including the name and business address of every engineer, architect, land surveyor, or soils scientist whose professional seal appears on any plan submitted to the Board)

3. Completed- " Checklist for Site Plan Review" (X)

4. Letter of Explanation (X)

5. Written Request for Waiver (s) from " Site Plan Review and Subdivision Regulations" (if applicable) (X)

6. Completed "Preliminary Application to Connect and /or Discharge to Town of Exeter- Sewer, Water or Storm Water Drainage System(s)"(if applicable) (NA)

7. Planning Board Fees (X)

8. Seven (7) full-sized copies of Site Plan 5 Copies provided for TRC review (X)

9. Fifteen (15) 11"x17" copies of the final plan to be submitted **TEN DAYS PRIOR** to the public hearing date. (X)

10. Three (3) pre-printed 1"x 2 5/8" labels for each abutter, the applicant and all consultants. (X)

NOTES: All required submittals must be presented to the Planning Department office for distribution to other Town departments. Any material submitted directly to other departments will not be considered.

SITE PLAN REQUIREMENTS

7.4 Existing Site Conditions Plan

Submission of this plan will not be applicable in all cases. The applicability of such a plan will be considered by the TRC during its review process as outlined in Section 6.5 Technical Review Committee (TRC) of these regulations. The purpose of this plan is to provide general information on the site, its existing conditions, and to provide the base data from which the site plan or subdivision will be designed. The plan shall show the following:

APPLICANT	TRC	REQUIRED EXHIBITS
X	☐	7.4.1 Names, addresses, and telephone numbers of the owner, applicant, and person(s) or firm(s) preparing the plan.
X	☐	7.4.2 Location of the site under consideration, together with the current names and addresses of owners of record, of abutting properties and their existing land use.
X	☐	7.4.3 Title, date, north arrow, scale, and Planning Board Case Number.
X	☐	7.4.4 Tax map reference for the site under consideration, together with those of abutting properties.
X	☐	7.4.5 Zoning (including overlay) district references.
X	☐	7.4.6 A vicinity sketch or aerial photo showing the location of the land/site in relation to the surrounding public street system and other pertinent location features within a distance of 2,000-feet, or larger area if deemed necessary by the Town Planner.
X	☐	7.4.7 Natural features including watercourses and water bodies, tree lines, significant trees (20-inches or greater in diameter at breast height) and other significant vegetative cover, topographic features, and any other environmental features that are important to the site design process.
X	☐	7.4.8 Man-made features such as, but not limited to, existing roads, structures, and stonewalls. The plan shall also indicate which features are to be retained and which are to be removed or altered.
X	☐	7.4.9 Existing contours at intervals not to exceed 2-feet with spot elevations provided when the grade is less than 5%. All datum provided shall reference the latest applicable US Coast and Geodetic Survey datum and should be noted on the plan.
Waiver ☐ Requested	☐	7.4.10 A High Intensity Soil Survey (HISS) of the entire site, or appropriate portion thereof. Such soil surveys shall be prepared by a certified soil scientist in accordance with the standards established by the Rockingham County Conservation District. Any cover letters or explanatory data provided by the certified soil scientist shall also be submitted.

X	☐	7.4.11 State and Federally designated wetlands, setback information, total wetlands proposed to be filled, other pertinent information and the following wetlands note: “The landowner is responsible for complying with all applicable local, state, and federal wetlands regulations, including any permitting and setback requirements required under these regulations.”
X	☐	7.4.12 Surveyed property lines including angles and bearings, distances, monument locations, and size of the entire parcel. A professional land surveyor licensed in New Hampshire must attest to said plan.
X	☐	7.4.13 The lines of existing abutting streets and driveway locations within 200-feet of the site.
X	☐	7.4.14 The location, elevation, and layout of existing catch basins and other surface drainage features.
X	☐	7.4.15 The shape, size, height, location, and use of all existing structures on the site and approximate location of structures within 200-feet of the site.
X	☐	7.4.16 The size and location of all existing public and private utilities, including off-site utilities to which connection is planned.
X	☐	7.4.17 The location of all existing easements, rights-of-way, and other encumbrances.
X	☐	7.4.18 All floodplain information, including the contours of the 100-year flood elevation, based upon the Flood Insurance Rate Map for Exeter, as prepared by the Federal Emergency Management Agency, dated May 17, 1982.
X	☐	7.4.19 All other features which would fully explain the existing conditions of the site.
X	☐	7.4.20 Name of the site plan or subdivision.

7.5 Proposed Site Conditions Plan (Pertains to Site Plans Only)

The purpose of this plan is to illustrate and fully explain the proposed changes taking place within the site. The proposed site conditions plan shall depict the following:

APPLICANT	TRC	REQUIRED EXHIBITS
X	☐	7.5.1 Proposed grades and topographic contours at intervals not to exceed 2-feet with spot elevations where grade is less than 5%. All datum provided shall reference the latest applicable US Coast and Geodetic Survey datum and should be noted on the plan.
X	☐	7.5.2 The location and layout of proposed drainage systems and structures including elevations for catch basins.
X	☐	7.5.3 The shape, size, height, and location of all proposed structures, including expansion of existing structures on the site and first floor elevation(s). Building elevation(s) and a rendering of the proposed structure(s).
X	☐	7.5.4 High Intensity Soil Survey (HISS) information for the site, including the total area of wetlands proposed to be filled.
X	☐	7.5.5 State and Federally designated wetlands, setback information, total wetlands proposed to be filled, other pertinent information and the following wetlands note: "The landowner is responsible for complying with all applicable local, state, and federal wetlands regulations, including any permitting and setback requirements required under these regulations."
X	☐	7.5.6 Location and timing patterns of proposed traffic control devices.
X	☐	7.5.7 The location, width, curbing and paving of all existing and proposed streets, street rights-of-way, easements, alleys, driveways, sidewalks and other public ways. The plan shall indicate the direction of travel for one-way streets. See Section 9.14 – Roadways, Access Points, and Fire Lanes for further guidance.
X	☐	7.5.8 The location, size and layout of off-street parking, including loading zones. The plan shall indicate the calculations used to determine the number of parking spaces required and provided. See Section 9.13 – Parking Areas for further guidance.
X	☐	7.5.9 The size and location of all proposed public and private utilities, including but not limited to: water lines, sewage disposal facilities, gas lines, power lines, telephone lines, cable lines, fire alarm connection, and other utilities.
X	☐	7.5.10 The location, type, and size of all proposed landscaping, screening, green space, and open space areas.
X	☐	7.5.11 The location and type of all site lighting, including the cone(s) of illumination to a measurement of 0.5-foot-candle.
X	☐	7.5.12 The location, size, and exterior design of all proposed signs to be located on the site.
X	☐	7.5.13 The type and location of all solid waste disposal facilities and accompanying screening.

X	☐	7.5.14 Location of proposed on-site snow storage.
X	☐	7.5.15 Location and description of all existing and proposed easement(s) and/or right-of-way.
X	☐	7.5.16 A note indicating that: “All water, sewer, road (including parking lot), and drainage work shall be constructed in accordance with Section 9.5 Grading, Drainage, and Erosion & Sediment Control and the Standard Specifications for Construction of Public Utilities in Exeter, New Hampshire”. See Section 9.14 Roadways, Access Points, and Fire Lanes and Section 9.13 Parking Areas for exceptions.
X	☐	7.5.17 Signature block for Board approval

OTHER PLAN REQUIREMENTS (See Section indicated)

- ☒ 7.7 Construction plan
- ☒ 7.8 Utilities plan
- ☒ 7.9 Grading, drainage and erosion & sediment control plan
- ☒ 7.10 Landscape plan
- ☐ 7.11 Drainage Improvements and Storm Water Management Plan
- ☐ 7.12 Natural Resources Plan
- ☐ 7.13 Yield Plan

Application Fee Worksheet

PHILLIPS EXETER ACADEMY

Wetherell, Merrill, and Langdell Replacement and Renovation
ASSESSORS' MAP 72, LOT 208

Site Plan Review (Major)	=	$250
Total New Building Floor Area = 31,188 s.f.		
31,188 sf/ 1000 X $60.00	=	$1,871.28
Abutter Notices - $10 / ea (14, Including Professionals)	=	$140
Public Notice	=	to be billed separately
TOTAL DUE	**=**	**$2,261.28**

PHILLIPS EXETER ACADEMY

20 Main Street, Exeter, NH 03833

Wetherell, Merrill, Langdell Replacement and Renovation
Tax Map 72 Lot 208

Planning Board – Site Plan Review/LLA/Conditional Use Permit Abutter's List

Owner / Professionals:

Owner/Applicant:
Tax Map 72, Lot 208 Phillips Exeter Academy 20 Main Street Exeter, NH 03833 Attn: Mark Leighton
Architect
Robert A.M. Stern Architects, LLP. 1 Park Avenue New York, NY 10016 Attn: George de Brigard
Civil Engineer
Altus Engineering, Inc. 133 Court Street Portsmouth, NH 03801 Attn: Cory D. Belden
Land Surveyor
Nitsch Engineering 360 Merrimack Street, Suite 49 Building #5, Second Floor Lawrence, MA 01843 Attn: Jamie Gayton
Landscape Architect
Kyle Zick Landscape Inc. 36 Broomfield Street, Suite 202 Boston, MA 02108 Attn: Kyle Zick

Property Abutters List Attached.

Abutters List -Wetherell, Merrill, Langdell Replacement and Renovation (Abutters to PEA owned Parcel 72-208)						
Direct Abutters:						
Parcel ID	**Owner**	**Property Address**	**Mailing Address**	**City**	**State**	**Zip Code**
64-41	Phillips Exeter Academy	231-237 Water St	20 Main St	Exeter	NH	03833
64-42	Phillips Exeter Academy	255 Water St	20 Main St	Exeter	NH	03833
72-162	Phillips Exeter Academy	40 Front St	20 Main St	Exeter	NH	03833
72-169	Phillips Exeter Academy	Elm, Eliot, Court St	20 Main St	Exeter	NH	03833
72-197	Town of Exeter	45 Front St	10 Front St	Exeter	NH	03833
72-198	Exonian Properties LLC	43 Front St	185 Water St	Exeter	NH	03833
72-199	Christine E Spencer	41 Front Street #1	41 Front Street #1	Exeter	NH	03833
72-199	Susan Adams Loyd	41 Front Street #2	7140 Mark Terrace Dr	Edina	MN	55439
72-199	Godse Trivikram V Rev Trust	41 Front Street #3	41 Front Street #3	Exeter	NH	03833
72-199	J Smith Rentals LLC	41 Front Street #4	PO Box 265	Danvers	MA	01923
72-201	Northern New England	15 Center St	770 Elm St	Manchester	NH	03101
72-203	Phillips Exeter Academy	11-13 Spring St	20 Main St	Exeter	NH	03833
72-204-1	Phillips Exeter Academy	17 Spring St	20 Main St	Exeter	NH	03833
72-204-2	Phillips Exeter Academy	Spring St	20 Main St	Exeter	NH	03833
72-206	Society of the Cincinnati C/O American Independence Museum	164 Water St	1 Governors Ln	Exeter	NH	03833
72-207	Phillips Exeter Academy	Spring St	20 Main St	Exeter	NH	03833
72-209	Phillips Exeter Academy	Main/Front/Tan Ln	20 Main St	Exeter	NH	03833
72-211	Phillips Exeter Academy	13 Main St	20 Main St	Exeter	NH	03833
72-212	Phillips Exeter Academy	7 Main St	20 Main St	Exeter	NH	03833
72-213	Phillips Exeter Academy	3 Main St	20 Main St	Exeter	NH	03833
72-214	Phillips Exeter Academy	239 Water St	20 Main St	Exeter	NH	03833
** Note - 1 notification will be sent to PEA - with for all abutting parcels - including: 64-41, 64-42, 72-162, 72-169, 72-203, 72-204-1,72-204-2, 72-207, 72-209, 72-211, 72-212, 72-213, 72-712						
Confirmed through VGSI.com database						
9 Letters (1 for PEA, 8 for all others)						

Wetherell Dining Hall

Spring Street

Exeter, New Hampshire

Engineer's Opinion of Costs - Site Work

BASIS: Site Plans dated July 11, 2022

DATE: 08-Jul-22
PROJECT: 5146

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL COST
SITE PREPARATION	1.00	LS	$50,000.00	$50,000
TEMPORARY EROSION CONTROL				
SILT BARRIER	480	LF	$4.00	$1,920
ALLOWANCE FOR E&SC INSPECTIONS	1	LS	$2,000.00	$2,000
AGGREGATE BASE COURSES				
12" BANK RUN GRAVEL	320	CY	$16.00	$5,120
6" CRUSHED GRAVEL	400	CY	$22.00	$8,800
RETAINING WALLS				
SITE RETAINING WALLS	1	LS	$40,000.00	$40,000
HOT BITUMINOUS PAVEMENT				
CONCRETE PAVEMENT	1,230	SF	$15.00	$18,450
BITUMINOUS PAVEMENT	1,160	SF	$12.00	$13,920
BITUMINOUS WALKWAYS	4,200	SF	$6.00	$25,200
STORM DRAINAGE				
CATCH BASINS/DMH	4	LS	$4,000.00	$16,000
YARD DRAINS	7	LS	$500.00	$3,500
DRAIN PIPE 0-15"	485	LF	$50.00	$24,250
STORMWATER GALLERY	1	EA	$15,000.00	$15,000
SANITARY SEWER				
2,000 GAL GREASE TRAP	1	LS	$8,000.00	$8,000
SEWER MANHOLE	2	LS	$4,000.00	$8,000
SEWER PIPE 6-8"	170	LF	$50.00	$8,500
CURBING				
VERTICAL GRANITE CURB	230	LF	$35.00	$8,050
LANDSCAPING				
PLANTING ALLOWANCE	1	LS	$20,000.00	$20,000
SITE LIGHTING	2	EA	$2,500.00	$5,000

SUBTOTAL:	**$281,710**
Contingency (15%):	**$42,290**
USE:	**$324,000**

LETTER OF EXPLANATION

Phillips Exeter Academy
Wetherell, Merrill, and Langdell Replacement and Renovation

20-24 Spring Street
Exeter, NH
Tax Map 72 Lot 208

July 2022

Phillips Exeter Academy is proposing to raze the existing Wetherell Dining Hall and renovate both Merrill Hall and Langdell Hall to provide updated student and faculty housing that meets current building codes. Wetherell Dining Hall is located between and connected to Merrill and Langdell Halls which are located at corner of Spring Street and Main Street. The property is identified on the Exeter Assessors Map as Tax Map 72-Lot 208 in the Residential (R-2) zoning district and is approximately 11.4 acres in size. The property is bound by Front Street to the south, Tan Lane to the west, Main Street to the north, and Spring Street to the east. There fifteen institutional buildings located on the property including the Academy Building, Jeremiah Smith Hall (Administration Building), and multiple academic and dormitory buildings.

Wetherell Hall, one of the Academy's two dining halls, was built in the 1930's, updated in 1967, and in need of replacement to meet the current needs of the campus. The existing 21,194 square foot dining hall will be demolished, and a new 31,188 square foot dining hall will be constructed in its place. The existing building is setback 6.8 feet from the property line along Spring Street. The proposed building will be set back 18.3 feet to allow for delivery and waste removal vehicles to park on site and not impact Spring Steet. There is no on-site parking for the building, but PEA owns a parking lot across Spring Street with twelve available parking spaces (Tax Map 72, Lot 207).

The dormitory renovations will be interior to the existing buildings with only minor modifications to the entrances. The existing total bed count will be slightly increased from 82 beds to 86 beds and the six faculty apartments will be maintained as part of the renovation.

The site was developed prior to regulations requiring treatment of stormwater. As such, there is no stormwater treatment on the current site. The proposed project will have minimal impact outside of the building footprint, but stormwater treatment will be provided to collect, retain, and treat the roof runoff from the new building and portions of the existing buildings. The proposed project will provide treatment using deep sump catch basins and a sub-surface chamber system and peak runoff rates from the site area will be reduced for all of the storm events analyzed.

Site Plan Review - Waiver Request

Phillips Exeter Academy
Wetherell, Merrill, and Langdell Replacement and Renovation
Spring Street

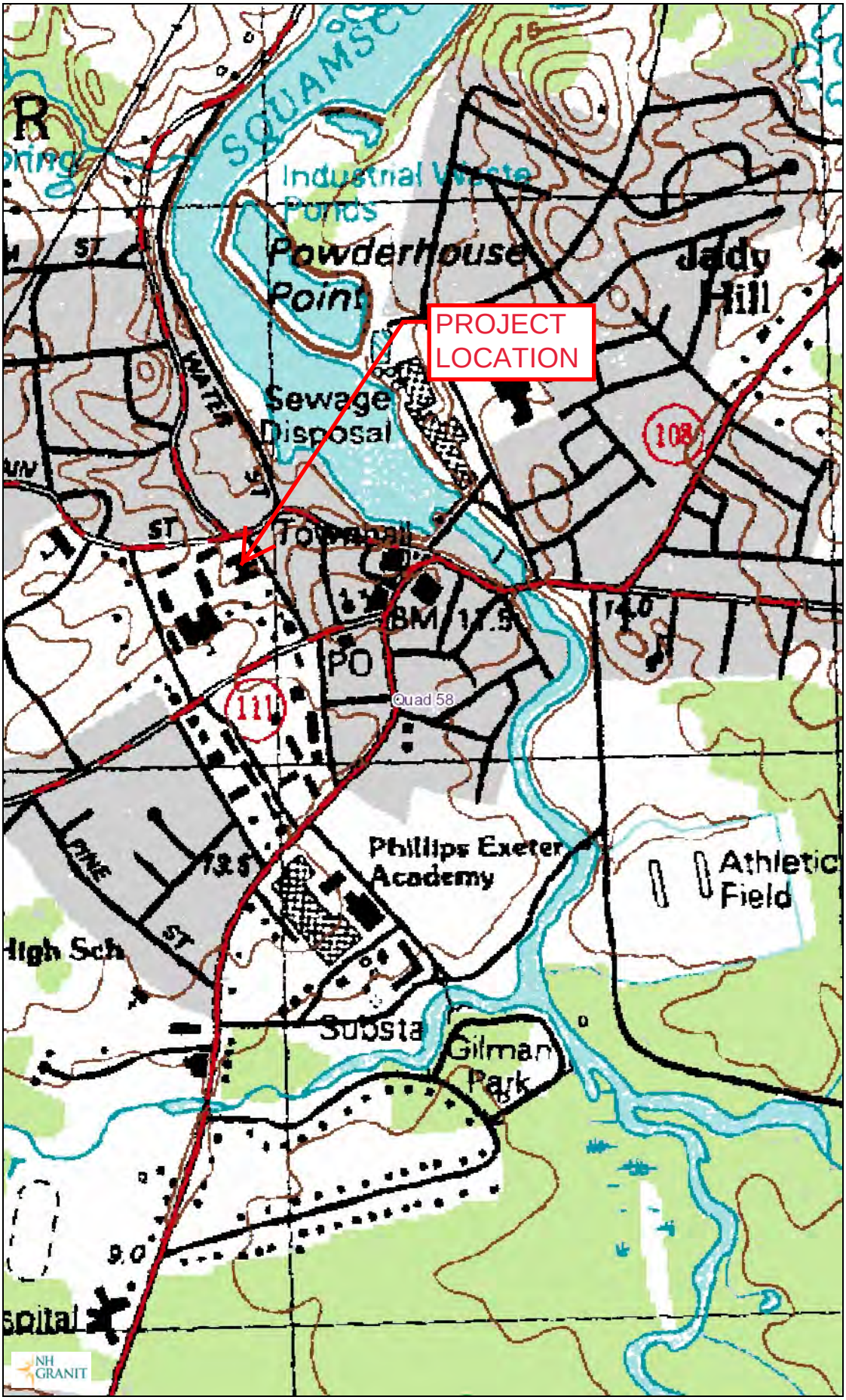
July 11, 2022

Waiver Request #1: 7.4.10 – High Intensity Soil Survey (HISS)

A waiver is requested from the requirement to provide a High Intensity soil Survey because the entire site is a previously disturbed area and there is limited site work outside of the building footprint. The National Resource Conservation Service (NRCS) web soils survey was used to identify the underlying soils for the project site, as well as geotechnical borings for the soil descriptions and groundwater elevations. The NRCS soils survey indicates Hoosic soils, a very well drained soil (HSG A), in the project area. S.W.Cole, the geotechnical engineer, completed borings and infiltration testing for the project, which were used in the stormwater design. This information provides the needed information to adequate design the stormwater system and is not contrary to the spirit of regulations. Therefore;

- Granting of the waiver will not be detrimental to the public,
- Because the site is unique and is already completely disturbed, it would be a hardship to the owner to if the strict letter of the regulations were carried out, as the existing soils do not represent a soil series and the relevant information was obtained with infiltration testing and borings,
- It is not contrary to the spirit of the ordinance, and
- It will not very the provisions of the Zoning Ordinance or Master Plan.

Exeter, NH



Legend

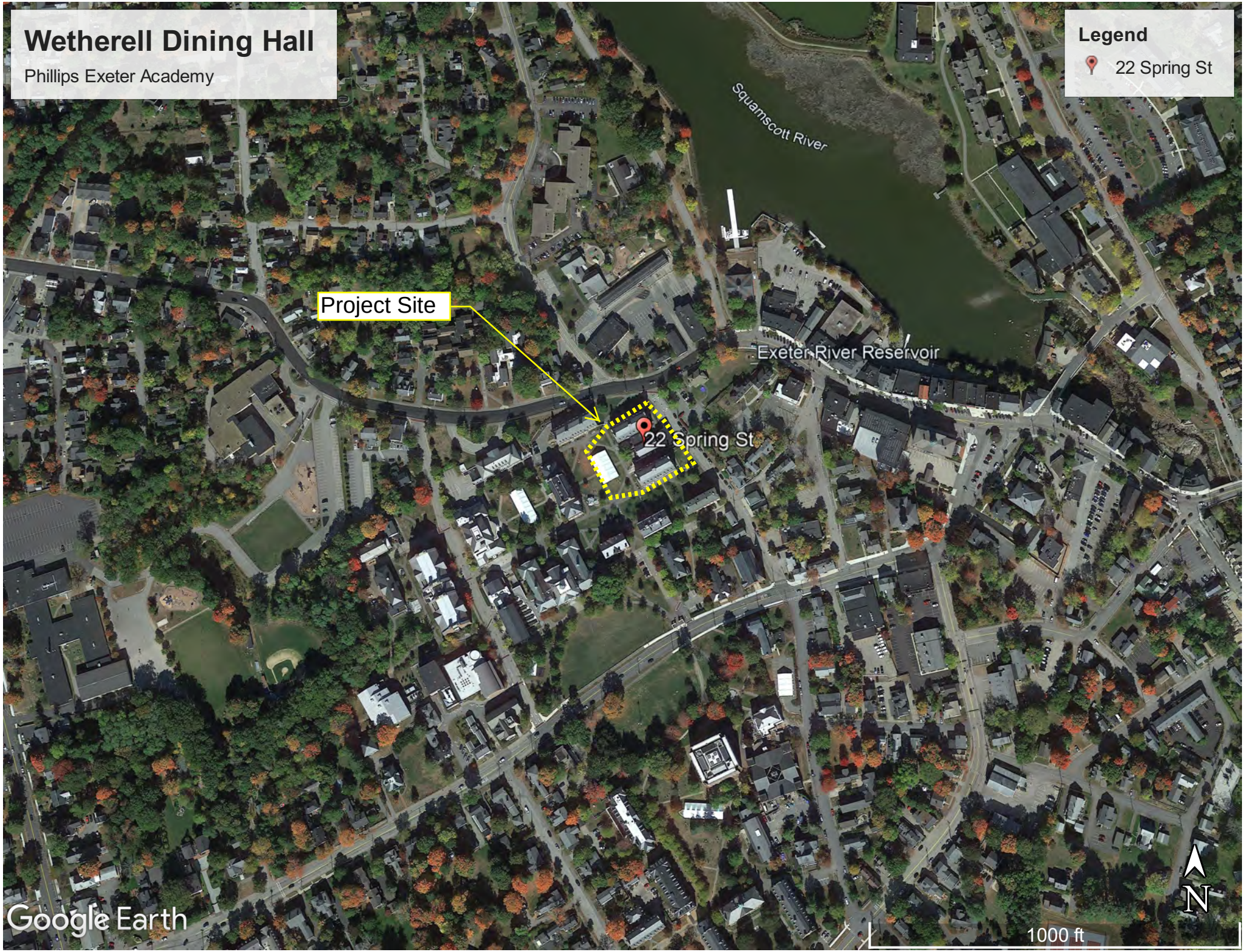
- State
- County
- City/Town
- 15-Minute Quadrangle Boun

Map Scale

1: 10,000

Map Generated: 6/21/2022

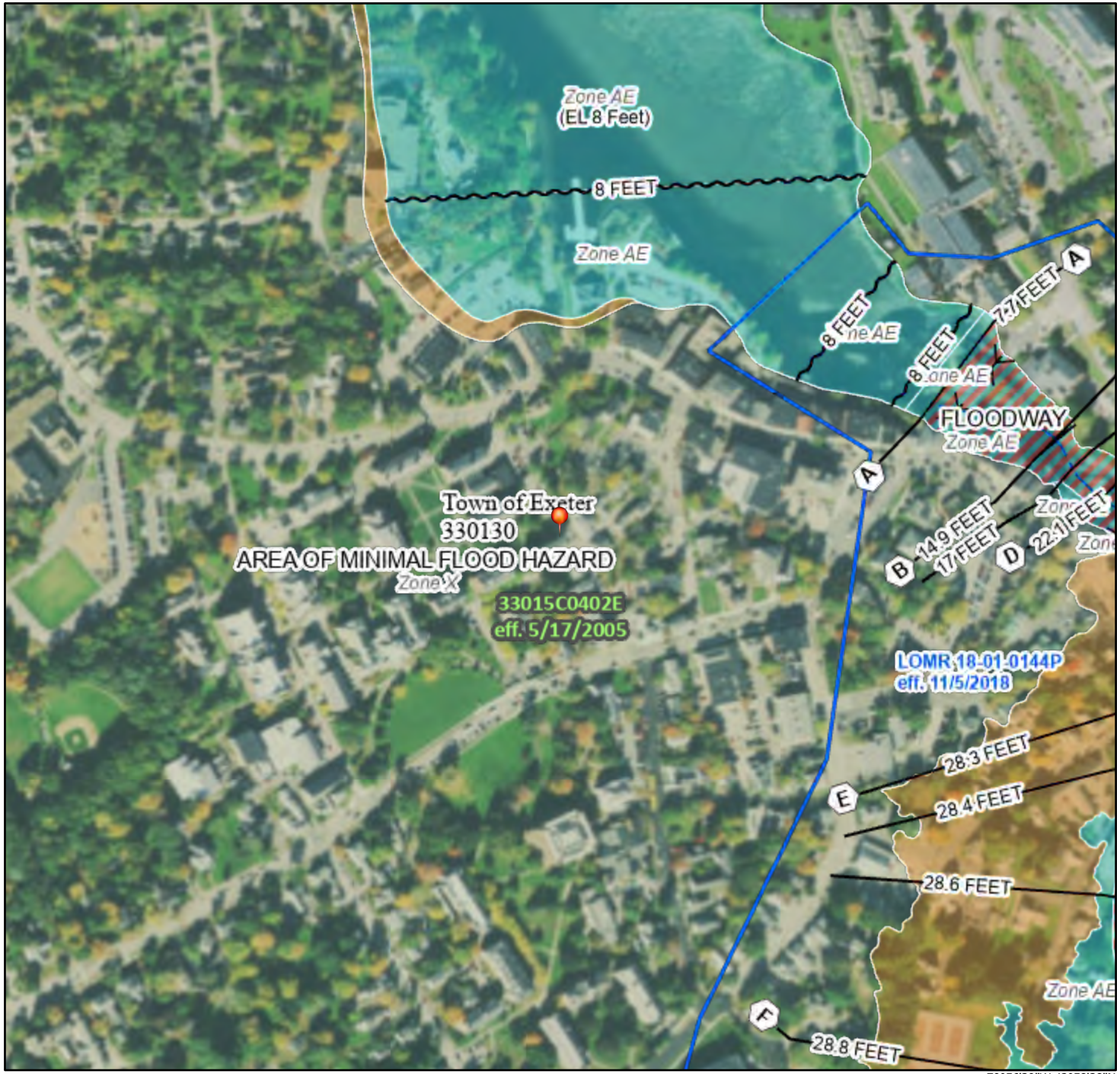
Notes


Wetherell Dining Hall
Phillips Exeter Academy
Legend
22 Spring St
Squamscott River
Project Site
Exeter River Reservoir
22 Spring St
Google Earth
N
1000 ft

National Flood Hazard Layer FIRMette

FEMA

70°57'17"W 42°59'4"N



70°56'39"W 42°58'38"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

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

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/11/2022 at 8:54 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

TOWN OF EXETER

Planning and Building Department

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709
www.exeternh.gov

Date: August 11, 2022
To: Cory Belden, P.E., Altus Engineering Inc.
Mark Leighton, Facilities Director, Phillips Exeter Academy

From: Dave Sharples, Town Planner

Re: Site Plan Review TRC Comments
Phillips Exeter Academy – Wetherell Dining Hall - PB Case #22-12
Tax Map Parcels #72-208

The following comments are provided as a follow-up for technical review of the site plans and supporting documents submitted on July 12th, 2022 for the above-captioned project. The TRC meeting was held on Thursday, August 4, 2022 and materials were reviewed by Town departments.

TOWN PLANNER COMMENTS

- UEI will conduct a third party review;
- Are there any known environmental hazards on the site? Have any environmental studies/assessments been performed? If so, please provide copies;
- Add note per Section 7.5.16; and,
- In accordance with Section E.III.B.2 & 3 of the Specifications for the Construction of Roads, Sidewalks, Bridges and Street Signs, commercial driveway widths can only exceed 30' with approval from the Town Engineer. As discussed at the TRC, please reduce the curb cut and add mountable granite curbing with the goal of making the width as short as possible while still maintaining accessibility. Please work with the Town Engineer to address this comment.

PUBLIC WORKS COMMENTS

E-mail received from Town Engineer Paul Vlasich, dated 8/11/22, indicating that the larger drainage issues was just a discussion – he has no specific request for changes.

FIRE DEPARTMENT COMMENTS

Received telephone call from Deputy Fire Chief Jason Fritz on 7/28/22 noting he would be on vacation the following week and would not be attending the TRC meeting. He indicated that he had spoken with the Applicant and their representatives and confirmed he had no Fire Dept. comments.

NATURAL RESOURCE PLANNER COMMENTS

No review necessary – no comments.

In order to be heard at the **September 8th, 2022** Planning Board meeting, please submit any revised plans along with a letter responding to these comments (and other review comments, if applicable) **no later than August 25th,** but sooner if possible, to allow staff adequate time to review the revisions and responses prior to the planning board hearing.

civil &
environmental
engineering

UNDERWOOD
engineers

2833.00

August 11, 2022

David Sharples, Town Planner
Town Planning Office, Town of Exeter
10 Front Street
Exeter, NH 03833

Re: ***PEA Wetherell Dining Hall Replacement***
Design Review Engineering Services
Exeter, New Hampshire

Site Information:

Review No. 1

Tax Map/Lot#:	72 / 208
Address:	20-24 Spring Streett
Lot Area:	11.4 ac (0.7 ac being developed)
Proposed Use:	Institutional
Water:	Town
Sewer:	Town
Zoning District:	R-2
Applicant:	Phillips Exeter Academy
Design Engineer:	Altus Engineering

Application Materials Received:

- Site plan set entitled "Wetherell, Landell, and Merrill Renovation and Replacement Project" dated July 11, 2022, prepared by Altus Engineering.
- Site plan application materials prepared by Altus Engineering.
- Truck Turning Templates dated July 5, 2022, prepared by Altus Engineering.
- Drainage analysis and stormwater maintenance manual prepared by Altus Engineering.

Dear Mr. Sharples:

Based on our review of the above information, in addition to comments provided by the Town, we offer the following comments in accordance with the Town of Exeter Regulations and standard engineering practice.

General

1. We believe a NHDES Sewer Connection is required. Please confirm.

ph 603.230.9898
fx 603.230.9899
99 North State Street
Concord, NH 03301
underwoodengineers.com

Existing Conditions Plan

2. It is unclear where the trench drain at the top of the stairs at the northwest corner of Merrill Dormitory connects to the drainage system. The label indicated "NPV". What does NPV stand for? We note there is an 8" line to the drain manhole to the northwest of the trench drain, but the label shows that line is capped. This trench drain should be shown on other plans if it is to remain.
3. The size of the box culvert going into the existing DMH at the northwest corner of the courtyard should be labeled.
4. The diameter of the existing DMH at the northwest corner of the courtyard should be labeled.
5. Materials and sizes of the existing water lines should be labeled. Abandoned lines should be labeled as appropriate.

Site Plan

6. The limits of the proposed sidewalk and curbing replacement along Main Street and Spring Street is unclear. Please clarify.

Utilities Plan

7. The grease trap is noted as sized per serving meals. Catering is also provided out of the kitchen. What effect will the catering operation have on the grease trap capacity? Please confirm sizing.

Grading, Drainage, and Erosion Control Plan

8. Widths of the stone drip edge should be clearly labeled, as the detail on the landscaping plans refer to the plans for the widths.
9. Drainage Structure table:
    - The information for the existing DMH at the northwest corner of the courtyard should be added.
    - Information noted for PCB #6 needs to be updated
    - "Pad #3" should be changed to "PYD #3"
10. The existing DMH at the northwest corner of the courtyard appears to have 8 inlet pipes and one outlet. Please confirm that the pipe sizes can be accommodated at the angles ad inverts required.

Landscaping Plan

11. Underground utilities should be shown. It appears 3 of the proposed trees may be directly over utilities and should be shifted as needed.

Detail Sheets

12. The Concrete Paving Detail shows a depth of 7.5", while the snowmelt detail on the landscaping detail sheet shows a depth of 7". Coordination is needed.

Stormwater Design and Modeling

13. The narrative should be revised to include a discussion of the redevelopment of this area of the total lot in regard to the Town's regulations for redevelopment in Section 9.3 of the Site Plan and Subdivision regulations. Please clarify if the site falls under 9.3.2.3 or 9.3.2.4.

14. The existing conditions plan shows four additional pipes entering Pond 1P from the north and west. Those flows are not included in the drainage calculations. Please update as appropriate to ensure the adequacy of Pond 1P and ensure the existing outlet pipe has adequate capacity.

15. PTAP Database: This project requires registration with the PTAP Database, the Applicant is requested to enter project related stormwater tracking information contained in the site plan application documents using the Great Bay Pollution Tracking and Accounting Program (PTAP) database (www.unh.edu/unhsc/ptapp) and submit the information with the resubmitted response to comments.

A written response is required to facilitate future reviews. Please contact us if you have any questions.

Very truly yours,
UNDERWOOD ENGINEERS, INC.

Allison M. Rees, P.E.
Project Manager

Robert J. Saunders, P.E.
Senior Project Engineer

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

August 30, 2022

Town of Exeter
Planning Board
10 Front Street
Exeter, NH 03833

RE: Application for Site Plan Review
Wetherell, Langdell, and Merrill Renovation and Replacement Project
Tax Map 72, Lot 208
Case #2022-12

Dear Board,

On behalf of Phillips Exeter Academy (Academy), Altus Engineering, Inc. (Altus) is pleased to submit the attached Application for Site Plan Review to replace the Wetherell Dining Hall and renovate Langdell Hall and Merrill Hall. The Academy is proposing to raze the existing Wetherell Dining Hall to construct a new dining hall to meet the campus needs and renovate both Langdell Hall and Merrill Hall to provide updated student and faculty housing that meets current building codes. Wetherell Dining Hall is located between and connected to Merrill and Langdell Halls, which are located at corner of Spring Street and Main Street. The property is identified on the Exeter Assessors Map as Tax Map 72-Lot 208 in the Residential (R-2) zoning district and is approximately 11.4 acres in size. There fifteen institutional buildings located on the lot including the Academy Building, Jeremiah Smith Hall (Administration Building), and multiple academic and dormitory buildings. The property is bound by Front Street to the south, Tan Lane to the west, Main Street to the north, and Spring Street to the east.

On August 4, the project was reviewed by the Technical Review Committee (TRC). The following comments were provided, and responses are provided indicated how each comment is addressed in this re-submittal:

TOWN PLANNER COMMENTS

- UEI will conduct a third party review;

AE: The UEI review comments have been received and are addressed in this submittal.

- Are there any known environmental hazards on the site? Have any environmental studies/assessments been performed? If so, please provide copies;

AE: An asbestos survey and abatement report has been completed and provided to the Town Planner.

- Add note per Section 7.5.16; and,

AE: Note has been updated and is included as Note #2 on Shts C3.0, C4.0, and 5.0.

- In accordance with Section E.III.B.2 & 3 of the Specifications for the Construction of Roads, Sidewalks, Bridges and Street Signs, commercial driveway widths can only exceed 30' with approval from the Town Engineer. As discussed at the TRC, please reduce the curb cut and add mountable granite curbing with the goal of making the width as short as possible while still maintaining accessibility. Please work with the Town Engineer to address this comment.

AE: The driveway width has been reduced to under 30 feet and the remaining portion at the entrance will have a mountable curb with 1.5" reveal as discussed with the Town Engineer and Planner.

PUBLIC WORKS COMMENTS

E-mail received from Town Engineer Paul Vlasich, dated 8/11/22, indicating that the larger drainage issues was just a discussion – he has no specific request for changes.

AE: Comment noted. Altus and PEA understand that the full watershed does not adequately convey storm flows due to undersized drain system to the outlet in the Squamscott River. The larger drainage project that should not impede this project development, as the flows will be reduced for the proposed site improvements.

FIRE DEPARTMENT COMMENTS

Received telephone call from Deputy Fire Chief Jason Fritz on 7/28/22 noting he would be on vacation the following week and would not be attending the TRC meeting. He indicated that he had spoken with the Applicant and their representatives and confirmed he had no Fire Dept. comments.

AE: Comment noted. The building will be sprinklered and access is provided from both Main Street and Spring Stret.

NATURAL RESOURCE PLANNER COMMENTS

No review necessary – no comments.

AE: Comment noted. No natural resources will be impacted.

UNDERWOOD ENGINNERING INC (UEI) COMMNETS:

General:

1. We believe a NHDES Sewer Connection is required. Please confirm.

AE: Altus has confirmed with NHDES that a Sewer Connection Permit is not required if the existing manhole and connection are used. Any alterations to the manhole will require a permit.

Existing Conditions Plan:

2. It is unclear where the trench drain at the top of the stairs at the northwest comer of Merrill Dormitory connects to the drainage system. The label indicated "NPV". What does NPV stand for? We note there is an 8" line to the drain manhole to the northwest of the trench drain, but the label shows that line is capped. This trench drain should be shown on other plans if it is to remain.

AE: PEA has water tested the drain to confirm the drain location. There is a 4” pipe that daylights in the existing wall and drains onto the grass. NPV = No Pipe Visible

3. The size of the box culvert going into the existing DMH at the northwest comer of the courtyard should be labeled.

AE: The surveyor has re-reviewed record drawings and has determined that the box culvert shown on the plans as “record” does not connect to the drain manhole.

4. The diameter of the existing DMH at the northwest comer of the courtyard should be labeled.

AE: Altus has reviewed video footage of the manhole and determined it is an approximate 4 ft diameter brick manhole. The diameter is labeled on the Drainage Plans.

5. Materials and sizes of the existing water lines should be labeled. Abandoned lines should be labeled as appropriate.

AE: The existing 8” ductile iron water service to the building from Main Street has been labeled on the Utilities Plan (Sheet C4.0) and the abandoned service from Spring Street is identified accordingly.

Site Plan:

6. The limits of the proposed sidewalk and curbing replacement along Main Street and Spring Street is unclear. Please Clarify.

AE: Notes have been removed that were indicating sidewalk match lines.

Grading, Drainage, and Erosion Control Plan:

7. The grease trap is noted as sized per serving meals. Catering is also provided out of the kitchen. What effect will the catering operation have on the grease trap capacity? Please confirm sizing.

AE: The Town of Exeter requirement is for the grease trap to be sized for 2.5 gallons per patron served. Although this is a cafeteria style service and not restaurant, the grease trap is sized based on the anticipated 720 meals per day (breakfast, lunch and dinner). The requirement is 1,800 gallon capacity and a 2,000 gallon (800 meals) grease trap is proposed. Although catering will occasionally be provided from this dining hall, it will not be regular and will often be for less than the 80 additional guest or on weekends when the dining hall is not at full capacity. Therefore, catering functions should not have an impact on the grease trap sizing.

Utilities Plan:

8. Widths of the stone drip edge should be clearly labeled, as the detail on the landscaping plans refer to the plans for the widths.

AE: The stone drip edge has been labeled on the site plan and landscape plan.

9. Drainage Structure table:
   The information for the existing DMH at the northwest comer of the courtyard should be added.
   - Information noted for PCB #6 needs to be updated
   - "Pad #3" should be changed to "PYD #3"

AE: the 8” pipe entering PCB#6 has been removed from the table and PYD #3 updated.

10. The existing DMH at the northwest comer of the courtyard appears to have 8 inlet pipes and one outlet. Please confirm that the pipe sizes can be accommodated at the angles and inverts required.

AE: The DMH is approximately 17 ft deep. The proposed connection is at elevation 15.0 on the southwest side of the MH. There is a 12” drain line entering from the south at elevation 16.3. If needed, the invert of the proposed line can be lowered to avoid conflict. The existing manhole is a brick manhole so the bricks will be removed with concrete patching for the pipe penetration.

Landscape Plan:

11. Underground utilities should be shown. It appears 3 of the proposed trees may be directly over utilities and should be shifted as needed.

AE: The trees have been moved away from the utilities and the utility lines added to the LS Plan. It is anticipated that minor adjustments may be needed in the field when the lines are verified in the field during construction.

Detail Sheets:

12. The Concrete Paving Detail shows a depth of 7.5", while the snowmelt detail on the; landscaping detail sheet shows a depth of 7". Coordination is needed.

AE: The plans have been coordinated to provide a 7” thick slab.

Stormwater Design and Modelling:

13. The narrative should be revised to include a discussion of the redevelopment of this area of the total lot in regard to the Town's regulations for redevelopment in Section 9.3 of the Site Plan and Subdivision regulations. Please clarify if the site falls under 9.3.2.3 or 9.3.2.4.

AE: Altus has prepared the attached “Stormwater Design Memo” to address the stormwater design criteria in regard to the Town’s regulations.

14. The existing conditions plan shows four additional pipes entering Pond IP from the north and west. Those flows are not included in the drainage calculations. Please update as appropriate to ensure the adequacy of Pond 1P and ensure the existing outlet pipe has adequate capacity.

AE: The existing outlet pipe at the drain manhole (Pond 1P) is the 30" trunk main that extends through campus from Tan Lan (formerly Kimmings Brook). The attached StreamStat report indicates that the upstream watershed is approximately 0.27 square miles (173 acres). It is known that this 30" line is undersized as Tan Lane will often flood during high storm events. As noted with the discussions with the Town Engineer, there is a larger discussion for the overall campus and town drainage system. PEA has installed a 30" relief culvert, but will not make the connection to the municipal system until the downstream system is capable of receiving the additional flows. The stormwater model shows that the peak flows from the site will be reduced by approximately 20%, so the proposed improvements will not negatively impact the system.

15. PTAP Database: This project requires registration with the PT AP Database, the Applicant is requested to enter project related stormwater tracking information contained in the site plan application documents using the Great Bay Pollution Tracking and Accounting Program (PTAP) database (www.unh.edu/unhsc/ptapp) and submit the information with the resubmitted response to comments.

AE: Agreed. The applicant will complete the PTAPP database.

Included in the application materials, please find fifteen (15) copies of the following application materials, including five (5) full size plans and ten (10) reduced plans.

1. Site Review Application, Checklists, and Fee
2. Abutter List and Mailing labels
3. Letter of Explanation
4. Site Cost Estimate
5. Waiver Request
6. USGS, Aerial, and FEMA Site Maps
7. StreamStat Watershed Report
8. Stormwater Design Memo
9. Drainage Report
10. Stormwater Inspection and Maintenance Manual
11. Vehicle Turning Templates
12. Project Plans (24" x 36")

We respectfully request to be placed on the Planning Board agenda on September 8, 2022.
If you have any questions, please do not hesitate to contact us.

Sincerely,
ALTUS ENGINEERING, INC.

Cory D. Belden, PE

ECopy: Mark Leighton / Heather Taylor, Phillips Exeter Academy
George de Brigard, Robert A.M. Stern Architects, LLP

Enclosures
Altus Prj: P5146

STORMWATER MANAGEMENT
INSPECTION AND MAINTENANCE MANUAL
FOR

Wetherell, Merrill, and Langdell
Replacement and Renovation
20-24 Spring Street
Exeter, NH
Tax Map 72 Lot 208

Proper inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality. The following responsible parties shall be in charge of managing the stormwater facilities:

RESPONSIBLE PARTIES:

Owner: *Phillips Exeter Academy* *(603) 772-4311*
Name *Company* *Phone*

Inspection and Maintenance : _____
Name *Phone*

NOTE: Annual Inspections Reports Shall be Submitted to the Exeter Department of Public Work by January 31st of each year. Inspection & Maintenance responsibilities transfer with ownership of property.

Included in this Inspection and Maintenance Manual are the following components:

- Drainage Features and Site BMP Functions and Maintenance Descriptions
- Stormwater System Operations and Maintenance Report Form
- Attachment B - Smart Salting Practices
- How Salt Works – NH Best Management Practices
- Site Grading and Drainage Plan

CULVERTS AND DRAINAGE PIPES

Function – Culverts and drainage pipes convey stormwater away from buildings, walkways, and parking areas and to surface waters or closed drainage systems.

Maintenance

- Culverts and drainage pipes shall be inspected semi-annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures. Debris shall be disposed of on site where it will not concentrate back at the drainage structures or at a solid waste disposal facility.

- Riprap Areas - Culvert outlets and inlets shall be inspected during annual maintenance and operations for erosion and scour. If scour or creek erosion is identified, the outlet owner shall take appropriate means to prevent further erosion.

SUB-SURFACE STORMWATER TREATMENT SYSTEM

Function – Sub-Surface treatment systems treat runoff prior to directing it to surface stormwater systems by filtering sediment and suspended solids, trapping them in the isolation rows and in the filter rock. Stormwater detention and infiltration can also be provided as the filtering process slows runoff, decreases the peak rate of discharge and promotes groundwater recharge.

The Sub-Surface Stormwater Treatment System shall be inspected and maintained at a minimum of every 6 months for the first year and annually thereafter. Inspections shall comply with the requirements of the manufacturer. At a minimum, the following inspection and maintenance requirements are included:

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT

A. Inspection ports (if present)
   - a.1. Remove/open lid on inline drain
   - a.2. Remove and clean filter if installed
   - a.3. Using a flashlight and stadia rod, measure depth of sediment and record on maintenance log
   - a.4. Lower a camera into isolator row for visual inspection of sediment levels (optional)
   - a.5. If sediment is at, or above, 3" (80 mm) proceed to step 2. if not, proceed to step 3.

B. All isolator rows
   - b.1. Remove cover from structure at upstream end of isolator row
   - b.2. using a flashlight, inspect down the isolator row through outlet pipe
     - i) Mirrors on poles or cameras may be used to avoid a confined space entry
     - ii) Follow OSHA regulations for confined space entry if entering manhole
   - b.3. If sediment is at, or above, 3" (80 mm) proceed to step 2. if not, proceed to step 3.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS

A. A fixed culvert cleaning nozzle with rear facing spread of 45" (1.1 m) or more is preferred

B. Apply multiple passes of jetvac until backflush water is clean
C. Vacuum structure sump as required

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE SYSTEM.

NOTES

1. Inspect every 6 months during the first year of operation and annually every year thereafter. Adjust the inspection interval based on previous observations of sediment accumulation and high water elevations.

2. Conduct jetting and vactoring annually or when inspection shows that maintenance is necessary.

CATCH BASINS AND DRAIN MANHOLES

Function – Catch basins collect stormwater, primarily from paved surfaces and roofs. Stormwater from paved areas often contains sediment and contaminants. Catch basin sumps serve to trap sediment, trace metals, nutrients and debris. Hooded catch basins trap hydrocarbons and floating debris.

Maintenance

- Remove leaves and debris from structure grates on an as-needed basis.
- Sumps shall be inspected and cleaned (as needed) on an annual basis to protect water quality and infiltration capacity. Catch basin debris shall be disposed of at a solid waste disposal facility.

DRIP EDGES

Function – Drip edges are to provide erosion control of surface where impervious surfaces meet non-impervious surfaces, such as building or roadway edges.

Maintenance

- Drip edges should be inspected annually for erosion, rutting, and migration of stone. Any areas experiencing erosion shall be properly maintained by replacing or adding additional stone to the area of concern.

LANDSCAPED AREAS - FERTILIZER MANAGEMENT

Function – Fertilizer management involves controlling the rate, timing and method of fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
- Do not apply fertilizer to frozen ground.
- Clean up any fertilizer spills.
- Do not allow fertilizer to be broadcast into water bodies.
- When fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

SALT MINIMIZATION

Maintenance

- Salt use shall be minimized. Sand shall be used for de-icing activities when possible. Salt is highly water-soluble. Contamination of freshwater wetlands and other sensitive areas can occur when salt is stored in open areas. Owner shall not store salt piles on site.
- Smart salting Practices. Owner's representative shall review and complete the Smart Salting Practices form included in the appendix annually prior to de-icing activities.
- Salt is highly water soluble. Contamination of freshwater wetlands and other sensitive areas can occur when salt is stored in open areas. Salt piles shall be covered at all times If not stored in a shed. Ruoff from stockpiles shall be contained to keep the runoff from entering the drainage system.

GENERAL CLEAN UP

Upon completion of the project, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, catch basin inlet basket, etc.). Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded. Remove any sediment in catch basins and clean drain pipes that may have accumulated sedimemt during construction.

Once in operation, all paved areas of the site should be swept at least once annually, preferably at the end of winter prior to significant spring rains.

APPENDIX

A. STORMWATER SYSTEM OPERATIONS AND MAINTENANCE REPORT

B. ATTACHMENT B - SMART SALTING PRACTICES

C. HOW SALT WORKS – NH BEST MANAGEMENT PRACTICES

D. GRADING AND DRAINAGE PLAN

STORM WATER SYSTEM OPERATION AND MAINTENANCE REPORT

General Information		
Project Name		
Owner		
Inspector's Name(s)		
Inspector's Contact Information		
Date of Inspection	**Start Time:**	**End Time:**
Type of Inspection: ☐ Annual Report ☐ Post-storm event ☐ Due to a discharge of significant amounts of sediment		
Notes:		

General Site Questions and Discharges of Significant Amounts of Sediment			
	Subject	**Status**	**Notes**
A discharge of significant amounts of sediment may be indicated by (but is not limited to) observations of the following. Note whether any are observed during this inspection:			*Notes/ Action taken:*
1	Do the current site conditions reflect the attached site plan?	❑Yes ❑No	
2	Is the site permanently stabilized, temporary erosion and sediment controls are removed, and stormwater discharges from construction activity are eliminated?	❑Yes ❑No	
3	Is there evidence of the discharge of significant amounts of sediment to surface waters, or conveyance systems leading to surface waters?	❑Yes ❑No	
4	Is there evidence of concentrated flows of stormwater such as rills or channels that cause erosion when such flows are not filtered, settled or otherwise treated to remove sediment?	❑Yes ❑No	
5	Is there evidence of deposits of sediment from the site on any adjacent property or stormwater system.	❑Yes ❑No	
6	Is there evidence of discharges from the site to streams running through or along the site where visual observations indicate significant amounts of sediment present in them.	❑Yes ❑No	
7	Is there evidence of invasive species within the stormwater treatment areas?	❑Yes ❑No	

Permit Coverage and Plans				
#	BMP/Facility	Inspected	Corrective Action Needed and Notes	Date Corrected
		❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		
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		❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		

ATTACHMENT B – SMART SALTING PRACTICES

A checklist for snow and ice maintenance contractors.

Recommended practice	Check which response applies to current practices and anticipated site maintenance activities for job site.				
	Already do	Will do	Might do	Will not do	If "will not do"....why not?
Use an application rate chart.					
Calibrate equipment each year.					
Learn about the deicer ingredients and use the appropriate one for the condition.					
Look for reasons if and why materials are leaking or spilling from vehicles and fix them (e.g. gaps, overfilling, etc).					
Develop a comprehensive winter maintenance policy. Follow your policy.					
Measure and use pavement temperatures.					
Use anti-icing appropriately prior to the storm.					
Plow before applying deicers.					
Use wet materials (pre-wet or pre-treated).					
Don't apply sodium chloride (road salt) for pavement temperatures below 15ºF.					
Don't apply deicers for pavement temps under -10º F. It's too cold.					
Separate salt and sand. Use salt for melting. Use sand for traction.					
Apply deicers in the center of the road or on the high side of the curve.					
Store the salt in a building or under secure cover.					
Store salt away from water flow and direct the water away from storage area.					
Store snow away from lakes, ponds and wetlands.					
Sweep up sand, dispose of properly.					
For each event, document what you did and how well it worked. Use this information to make improvements.					

Checklist is adapted from worksheet created by Fortin Consulting as a part of the Minnesota Pollution Control Agency Smart Salting Voluntary Certification Program.

How Salt Works

NH Best Management Practices

BE PROACTIVE - ANTI-ICE

Anti-icing is the proactive method of preventing snow and ice from bonding to pavement. It can be more than 50% more efficient than deicing. See the NH Anti-Icing Factsheet for more information.

PRE-WETTING FOR FASTER ACTING SALT

Adding brine to salt before you apply it to pavement jump starts the melting process which means your pavement will be clear sooner. See the Pre-wetting Fact Sheet for more information.

KNOW YOUR LIMITS

Dry salt becomes ineffective below 15°F if possible wait until the temperature rises before applying salt. At 30°F 1 lb of salt can melt 46.3 lb of ice in 5 minutes. At 15°F 1 lb of salt can melt 6.3 lb of ice in 1 hour.

PLOW FIRST

Always plow before applying any kind of chemical deicer to avoid pushing it away!

How Do We Melt Ice?

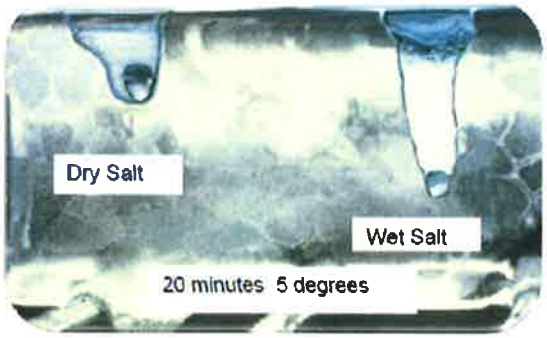
Ice can be melted by increasing the temperature, or lowering the freezing point of the water. It's not cost effective to use heat to melt ice on our roads so we use chemicals to reduce the freezing point—anything that will dissolve in water will work, including: salt, sugar, even alcohol!

Why Use Salt?

Salt (Sodium Chloride) is the cheapest and most readily available chemical that efficiently melts ice and can be easily applied to our roadways and parking lots. However salt does corrode our cars and bridges, contaminates drinking water and pollutes our streams. Alternatives include potassium acetate, and calcium magnesium acetate (CMA), — all of which are considerably more expensive than calcium chloride, and have their own environmental concerns.

Brine Makes It Happen

The first step in melting ice is the formation of a brine. Salt crystals pull water molecules out of ice formation which creates a brine with a lower freeze point. Once the brine is formed melting is greatly accelerated. Save time and money by pre-wetting your salt with a brine before it hits the pavement to jump start melting! See the Pre-Wetting fact sheet for more information.



Source: Wisconsin DOT Transportation Bulletin #22

Save $$ and the Environment

In New Hampshire there are over 40 watersheds currently contaminated from road salt. As the pavement temperature drops more salt is required. As the pavement temperature rises less salt is required. Save money and the environment by using only what is needed to do the job. See NH application rate charts for recommended rates.

Produced in partnership with:

NH Department of Environmental Services

New Hampshire DOT

Technology Transfer Center
New Hampshire LTAP at UNH

Anti-Icing

NH Best Management Practices

GET OUT EARLY

Typically anti-icing is most effective if applied 1-2 hours before the precipitation begins however it can be applied up to 24 hours in advance.

TRY IT FIRST

Trying anti-icing for the first time? Make a 23.3% brine solution and before a storm spray pavement on your own property using a masonry/ plant sprayer. Use this experiment to determine how best to use it with your clients.

LEAVE SOME PAVEMENT BARE

It's always best to use stream nozzles instead of fan tip to avoid creating a slippery condition. If the anti-icing liquid freezes the bare pavement will still provide a traction surface.

USE A FILTER

Having a filter in your liquid dispensing system will reduce clogs in your nozzle. Automotive in line fuel filters work quiet well. If your liquid dispenser is not functioning properly be sure to check the filter first.

A Proactive Treatment

Anti-Icing before a storm is very similar to using a non-stick spray on a pan before cooking. Just like a non-stick spray prevents food from bonding to the pan, anti-icing prevents snow and ice from bonding to the pavement so that it can be plowed away. Anti-icing can save you money as it costs 50% less than reactive deicing.

Make Your Own Salt Brine

When making brine it is important to add enough salt to produce a 23.3% solution which freezes around 0°F. Roughly 2.5lb per gallon of water will produce a 23.3% solution. You can verify using a salometer (~$20) a 23.3% solution will have a specific gravity of 1.176, or 85% salinity. Consult the Brine Making BMP sheet for more info.

How Much Should I Use and When?

You can apply brine up to 24 hours in advance of the storm. Typical application rates range from 0.5 to 0.75 gallon per 1000 sq.ft. (10' x 100' area). Other chemicals such as magnesium are also available—consult your supplier for application rates. Anti-icing is not advised prior to freezing rain events.

Getting Started

Try making your own salt brine by putting 13 lb of salt in 5 gallons of water to get a 23.3% salt brine solution. Mix the brine until all of the salt is dissolved. Using a masonry sprayer apply the liquid several hours before a storm. Start by applying about 0.25—0.5 gallons to a 10' x 50' area. Adjust the application rates based on your experience. Being careful not to over apply and cause a slippery condition.

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Pre-wetting

NH Best Management Practices

PRE-WETTING?

Pre-wetting is the process of coating a solid de-icer with a liquid before it is spread on a roadway.

WHY PRE-WET?

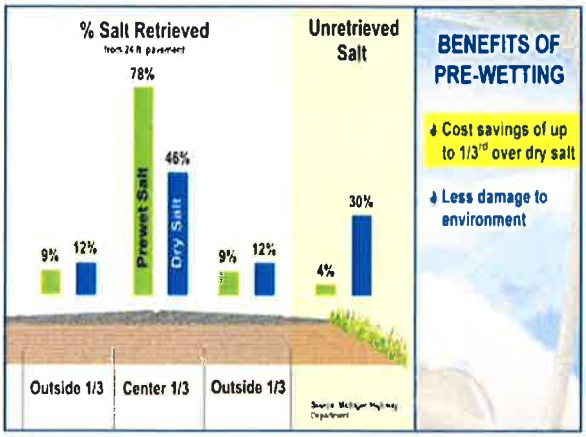
De-icing chemicals must form a brine before they can begin melting ice. Pre-wetting your chemicals accelerates the brine making process, which improves the melting action of the material. Pre-wetting also reduces bounce and scatter of material during spreading, and reduces the total amount of de-icer needed to obtain the desired results.

REDUCED RATES

If you are pre-wetting, don't forget to reduce your application rates accordingly. Reductions in the range of 15-20% are typical.

HOW MUCH LIQUID?

A good rule of thumb is to use 8-10 gallons of pre-wetting liquid for every ton of de-icer. For other chemicals, such as magnesium chloride, consult your supplier for application rates

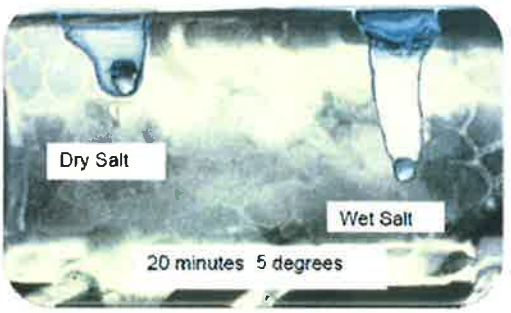


Pre-wetting Liquids

You have a few options for pre-wetting liquids. The most commonly used is a 23% sodium chloride brine solution. Calcium chloride at 32% solution is also used, as well as Magic Minus Zero™ and other patented products.

Getting Started

Wet the pile! There are two ways to pre-wet your de-icing chemicals. The easiest way to get started with pre-wetting is to spread your salt pile, spray it with pre-wetting liquid, mix it around, and re-pile it. More advanced truck mounted pre-wet systems can be installed on your trucks if you decide to make the investment.



Source: Wisconsin DOT Transportation Bulletin

Spraying the Pile

This is the easiest and most cost effective way to get started in pre-wetting. The first step is to spread your salt pile on a flat, impermeable surface. Next, spray the salt while it is spread out, and mix it around to ensure adequate and consistent liquid coverage. After the salt is sufficiently covered, re-stack the salt in your storage shed for later use.

Truck Mounted Systems

These systems are mounted in the truck bed and coat the de-icer with liquid as it comes off the conveyor/auger onto the spinner. These systems have the benefit of applying liquid only to the material you use as you use it. However, these systems must be installed on every truck that will be used to spread pre-wetted material.

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New Hampshire DOT

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Brine Making

NH Best Management Practices

GET THE LOWEST FREEZE POINT

When salt brine is 23% salt (measured with a hydrometer: 1.176, or with a salimeter: 85%) it has the lowest freeze point possible (about 0°F).

BRINE STORAGE

23% brine solution may be stored outside, however if temperatures get below 0°F the brine may freeze. A circulator pump will reduce the risk of freezing. If possible store brine indoors to eliminate risk of freezing.

COST OF BRINE

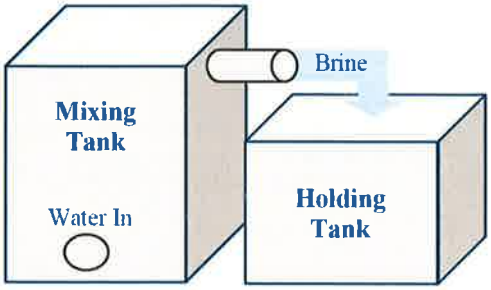
Calcium chloride brine costs about 7¢ / gallon (assuming $58/ton for salt) after you have your equipment setup.

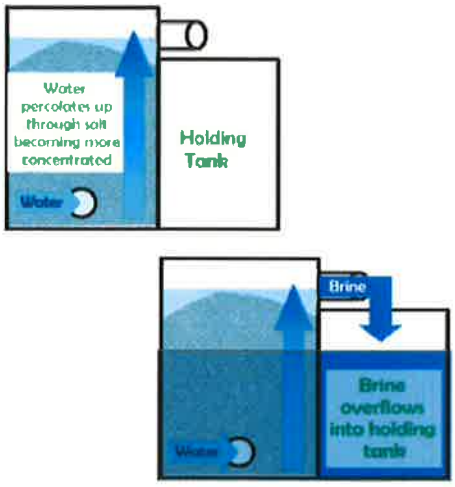
MULTIPLE USES

Brine can be used directly for anti-icing, for prewetting salt as it is dispensed from your truck, or to pretreat salt before it is loaded into your truck. Brine can be safely stored for up to a year, however, the concentration should be tested before use.

What Do You Need?

Brine making is a fairly simple process—the only ingredients are salt and water, and the only equipment you'll need is an open top mixing tank, a holding tank, a small pump, and a salimeter.



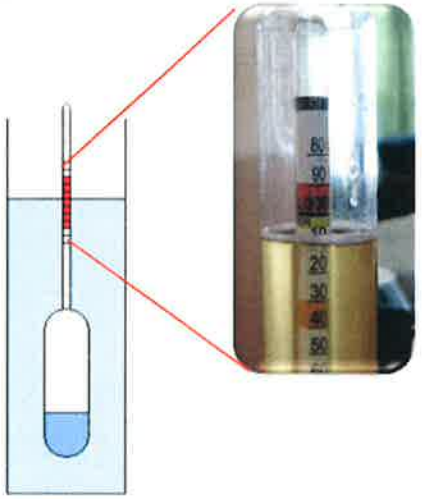


Images courtesy of Iowa DOT

Step 1: Fill Mixing Tank

Add Salt: Add about 2.5 lb of salt per gallon of water you plan to add. Make sure your mixing tank has a large opening to make adding salt easy.

Add Water: Slowly add water from the bottom of your brine mixing tank. This will allow it to percolate up through the salt and overflow into the holding tank.



Step 2: Check Concentration

Float a hydrometer or salimeter directly in your holding tank and read the value at the surface of the water. The number should be either 85% or 1.176 depending on the units of your device.

If the values are too low, pump some brine from your holding tank back into the mixing tank and allow it to overflow. If values are too high simply add some fresh water

Quality Control & Documentation

Make sure that you record the date when you create each batch of brine and document who mixed it and checked the concentration. It is also a good idea to note the final concentration. These records should be kept for at least two years to protect your group in the event of litigation.

Produced in partnership with:

NH Department of Environmental Services

New Hampshire DOT

Technology Transfer Center
New Hampshire LTAP at UNH

Hydraulic-Run Spreader Calibration

NH Best Management Practices

WHY CALIBRATE?

You can't reduce your salt use if you don't know how much salt you actually use! The goal of calibrating is to know how much material you are putting down on a roadway or parking lot for every setting on your truck that you use. This is why calibrating your equipment is the first step to reducing salt use and saving money!

REMEMBER:

Each truck must be independently calibrated for each material it will be used to spread (the salt calibration chart *will* be different than the sand calibration chart).

Calibrations should be preformed annually, or after a spreader is serviced.

CALCULATIONS:

There are a few simple calculations you must perform in order to complete the calibration. Once all of the necessary data is recorded, head back inside and warm up! Refer to the reverse side of this fact sheet for calculation instructions.

Step 1: Load the Truck

Partially load the truck. Half of a full load should be more than adequate for calibration purposes.

Step 2: Set Your Controls

Gate Height: Set the gate height to its lowest practical setting (~ 2"). This should be kept constant throughout the calibration process. If you find that not enough material is dispensed with this setting, try 2.5" to 3".

Engine Speed: Warm the truck up and run the engine at the typical rate seen during spreading (approximately 2000 rpm).

Step 3: Measure Spread Width

Measure the width that the material covers during spreading. Do this for each conveyor/auger setting you are calibrating. Round your numbers to the nearest half foot and record them in column "**W**" of the calibration chart (see reverse side).

Step 4: Collect & Weigh Material

You will need either a sheet of canvas, a tarp, or a bucket to collect the material that is dispensed from the spreader, as well as a scale. Weight the object you are using to collect the material in, and record that value in the purple box above the discharge rate column. Collect material for 1 minute. Weigh the collected material and subtract the weight of the tarp/canvas/bucket. Record this value in the first purple column of the calibration chart. Do this 3 times for each conveyor/auger setting that is typically used. Average these three values together and record in the orange column in the calibration chart.

Step 5: Perform Calculations

Go inside and calculate your discharge rate using the calibration chart for each truck speed and conveyor/auger setting you normally use. Refer to the reverse side of this fact sheet for calculation instructions. The formula you will be using is shown below:

$$D = \frac{B \times C}{A}$$

Step 6: Distribute Completed Calibration Cards!

Put a copy of the calibration chart in the truck you just calibrated. Also, leave a copy of the calibration chart in the office so you have a copy incase the original is damaged.

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NH Department of Environmental Services

New Hampshire DOT

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New Hampshire LTAP at UNH

* NOTE: ALL STORM DRAIN PIPING SHALL BE HDPE, UNLESS OTHERWISE NOTED

STORMWATER PRACTICES

STORMWATER GALLERY A
30" DIA PERF PIPE
3 ROWS / 50 FT LENGTH
PIPE INV = 15.25
ROCK BOTTOM = 14.75
ROCK TOP = 18.25

DRAINAGE STRUCTURES

PDMH = PROPOSED DRAIN MANHOLE
PCB = PROPOSED CATCH BASIN
PYD = PROPOSED YARD DRAIN

PYD #1
RIM = 20.00
8" INV OUT =16.50 (PYD2)

PYD #2
RIM = 20.00
8" INV IN=16.40 (PYD1)
8" INV OUT =16.30 (PYD3)

PAD #3
RIM = 20.10
8" INV IN=16.00 (PYD2)
8" INV OUT =15.90 (PYD4)

PYD #4
RIM = 20.10
8" INV IN=15.80 (PAD3)
8" INV OUT =15.70 (PDMH2)

PYD #5
RIM = 13.00
4" INV IN=9.80 (ROOF)
8" INV OUT =9.70 (PCB1)

PCB #6
RIM = 10.15
8" INV IN = 6.50 (PYD5)
12" INV OUT = 6.40 (PDMH3)
W/ HOOD

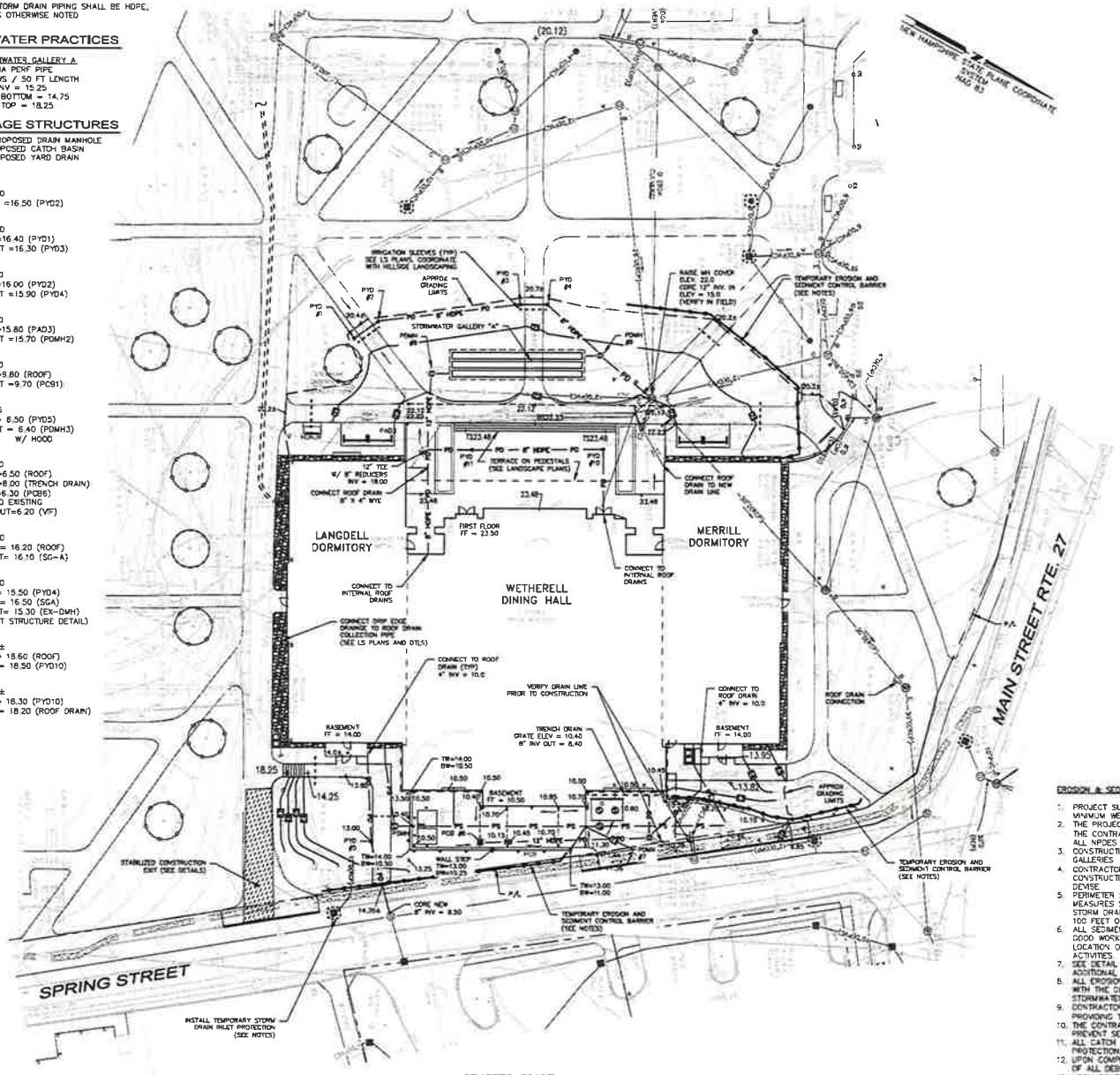
PDMH #7
RIM = 10.70
4" INV IN=6.50 (ROOF)
8" INV IN =8.00 (TRENCH DRAIN)
12" INV IN=6.30 (PCB6)
CONNECT TO EXISTING
2-8" INV OUT=6.20 (VIF)

PDMH #8
RIM = 20.60
12" INV IN= 16.20 (ROOF)
12" INV OUT= 16.10 (SG-A)

PDMH #9
RIM = 20.40
8" INV IN = 15.50 (PYD4)
12" INV IN= 16.50 (SGA)
12" INV OUT= 15.30 (EX-DMH)
(SEE OUTLET STRUCTURE DETAIL)

PYD #10
RIM = 22.5±
8" INV IN= 18.60 (ROOF)
8" INV OUT= 18.50 (PYD10)

PYD #11
RIM = 22.5±
8" INV IN= 18.30 (PYD10)
8" INV OUT= 18.20 (ROOF DRAIN)



GRAPHIC SCALE
0 5 10 20 40
(IN FEET)

GRADING AND DRAINAGE NOTES

1. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL FIELD VERIFY LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES SCHEDULED TO REMAIN.
2. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL READ AND FAMILIARIZE THEMSELVES WITH THE PROJECT GEOTECHNICAL REPORT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING ALL THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT.
4. DEWATERING ACTIVITIES SHALL BE DONE IN ACCORDANCE WITH EPA AND NHDES REGULATIONS AND GUIDELINES.
5. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES AREA SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN SOIL. CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS DEGREE OF INSULATION AGAINST FREEZING.
6. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
7. ALL STORM DRAIN PIPE SHALL BE ADS N-12 OR EQUAL AND APPROVED BY THE ENGINEER.
8. ALL CATCH BASIN, GATE VALVE COVERS, AND MANHOLE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISHED GRADE. ANY RIM OR VALVE COVER ABOVE SURROUNDING FINISHED GRADE WILL NOT BE ACCEPTED.
9. ALL CATCH BASINS SHALL BE PRECAST, H-20 LOADING AND BE EQUIPPED WITH 4-FOOT DEEP MIN SEDIMENTATION SUMPS AND GREASE HOODS. (SEE DETAILS)
10. ALL SPOT GRADES ARE AT THE FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
11. UNLESS OTHERWISE SPECIFIED, RETAINING WALL AND BUILDING PERIMETER DRAINS SHALL BE DIRECTED TO THE NEAREST DRAINAGE STRUCTURE. IF DEEMED APPROPRIATE, CONTRACTOR SHALL PROVIDE ADDITIONAL UNDERDRAINS AT THE DIRECTION OF THE ENGINEER.
12. RETAINING WALL FINISH TO BE SELECTED BY OWNER.
13. CONTRACTOR SHALL PROTECT ALL STORMWATER FACILITIES FROM CONSTRUCTION RUNOFF UNTIL THE WATERSHED AREA HAS BEEN STABILIZED.

EROSION & SEDIMENT CONTROL NOTES

1. PROJECT SUBJECT TO EPA NPDES GENERAL CONSTRUCTION PERMIT, NOI, SWPPP AND MINIMUM WEEKLY INSPECTIONS REQUIRED.
2. THE PROJECT REQUIRES A SWPPP THAT WILL BE MANAGED THROUGHOUT CONSTRUCTION BY THE CONTRACTOR. IT IS THE OWNER AND CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH ALL NPDES AND LOCAL REQUIREMENTS.
3. CONSTRUCTION STORMWATER SHALL NOT BE DIRECTED TO PROPOSED STORMWATER GALLERIES BEFORE SITE IS STABILIZED.
4. CONTRACTOR SHALL CONSTRUCT SEDIMENT TRAPS/BASINS FOR STORMWATER DURING CONSTRUCTION. SIZE AND LOCATION WILL DEPEND ON THE AREA DRAINING TO EACH DEVISE.
5. PERIMETER SEDIMENT CONTROLS AND CULVERT AND CATCH BASIN INLET PROTECTION MEASURES SHALL BE INSTALLED PRIOR TO EARTH DISTURBANCE ACTIVITIES. TEMPORARY STORM DRAIN INLET PROTECTION SHALL BE PLACED ON ALL CATCH BASIN INLETS WITHIN 100 FEET OF CONSTRUCTION ACTIVITIES.
6. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED. LOCATION OF CONTROL DEVICES MAY VARY DEPENDING ON CURRENT CONSTRUCTION ACTIVITIES.
7. SEE DETAIL SHEETS FOR PERTINENT SEDIMENT AND EROSION CONTROL DETAILS AND ADDITIONAL NOTES.
8. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH IN THE NHDES NH STORMWATER MANUALS, VOL 1-3, DATED DECEMBER 2008 AS AMENDED.
9. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
10. THE CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND ENSURE PERMANENT SOIL STABILIZATION.
11. ALL CATCH BASINS AND CULVERTS SHALL BE PROVIDED APPROPRIATE TEMPORARY INLET PROTECTION.
12. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
13. UPON COMPLETION OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
14. CONSTRUCTION ACTIVITIES SHALL BE MANAGED IN STRICT ACCORDANCE WITH NH RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES. NO INVASIVE SPECIES SHALL BE INSTALLED ON THE PROJECT SITE FOR ANY REASON.

CASE #22-12
TOWN OF EXETER PROJECT REFERENCE

ENGINEER:
ALTUS ENGINEERING, INC.
133 Court Street, Portsmouth, NH 03801
(603) 433-2335, www.altus-eng.com

ARCHITECT:
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TEL (212) 967-5100 | FAX (212) 967-5588

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD APPROVAL

ISSUE DATE: JULY 11, 2022

REVISIONS:

NO	DESCRIPTION	BY	DATE
0	PB APPLICATION	CDB	07/11/22

DRAWN BY: CDB
APPROVED BY:
DRAWING FILE: 5146SITE.DWG

SCALE: (24"x36") 1"=20'

OWNER/APPLICANT:
Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:
PHILLIPS EXETER ACADEMY
WETHERELL, MERRILL & LANGDELL, REPLACEMENT AND RENOVATION PROJECT
EXETER, NH 03833

TITLE:
GRADING, DRAINAGE AND EROSON CONTROL PLAN

SHEET NUMBER:
C5.0

FS146

Phillips Exeter Academy

Wetherell, Merrill, Langdell
Replacement and Renovation

20 - 24 Spring Street

Tax Map 72, Lot 208

DRAINAGE REPORT

July 2022

Prepared By:

ALTUS
ENGINEERING, INC.

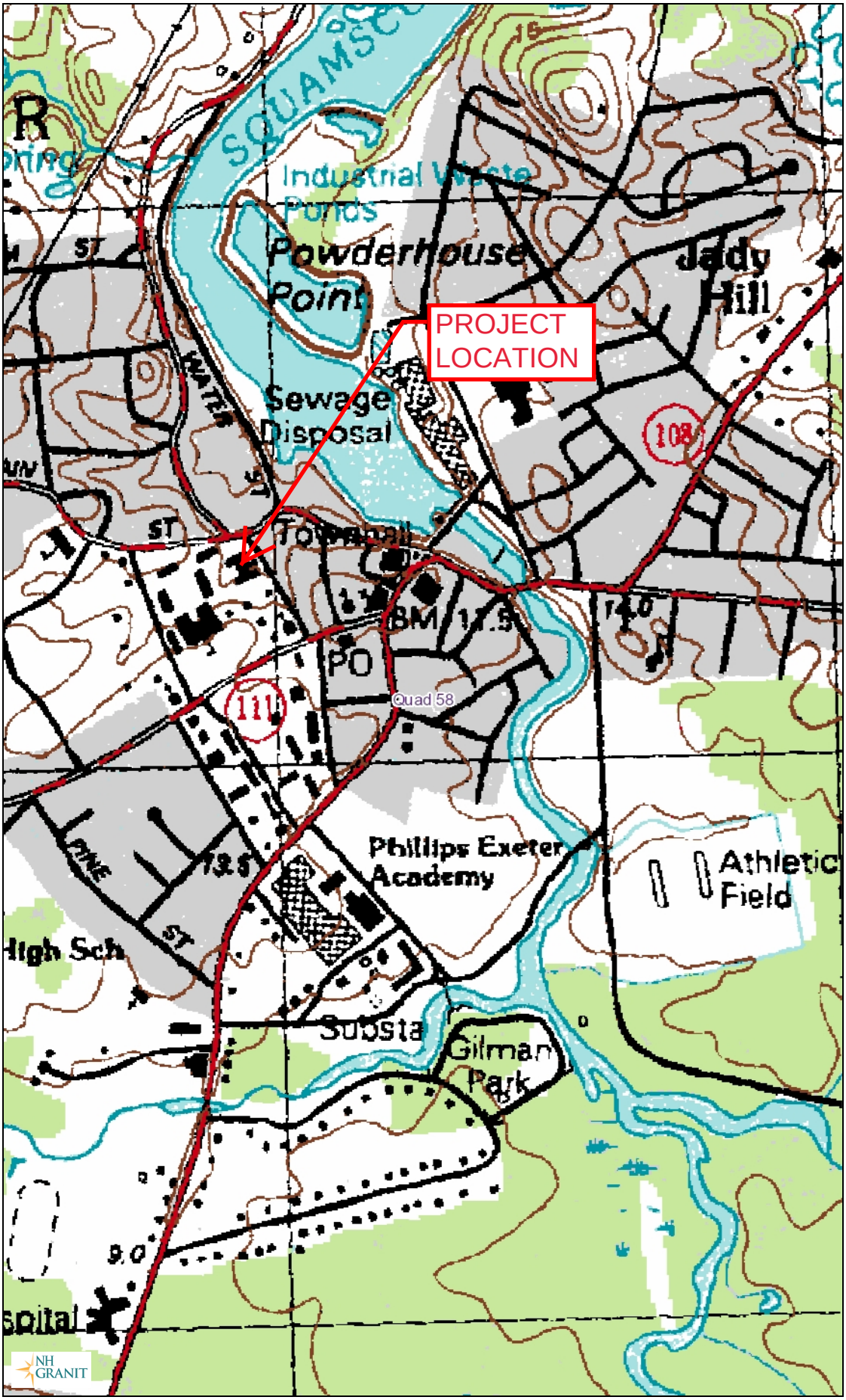
133 COURT STREET
(603) 433-2335
PORTSMOUTH, NH 03801
www.ALTUS-ENG.com

Wetherell, Merrill, and Langdell
Replacement and Renovation
20 - 24 Spring Street
(Tax Map 72, Lot 208)

TABLE OF CONTENTS

Submitted in this Drainage Report:

Exeter, NH



Legend

- State
- County
- City/Town
- 15-Minute Quadrangle Boun

Map Scale

1: 10,000

Map Generated: 6/21/2022

Notes

Drainage Report

Wetherell, Merrill, and Langdell Replacement and Renovation
20 - 24 Spring Street
Exeter, NH
Tax Map 72 Lot 208

INTRODUCTION

Phillips Exeter Academy is proposing to raze the existing Wetherell Dining Hall to construct a new dining hall facility and renovate Merrill Hall and Langdell Hall to provide updated student and faculty housing that meets current building codes. The dormitory renovation will be interior to existing buildings with only minor changes to the exterior for access. Wetherell Dining Hall is located between and connected to both Langdell Hall and Merrill Hall, at 20-24 Spring Street respectively. The property is identified on the Exeter Assessors Map as Tax Map 72-Lot 208, is approximately 11.4 acres in size and is bound by Front Street to the south, Tan Lane to the west, Main Street to the north, and Spring Street to the east. There are fifteen PEA institutional buildings located on the parcel. The property is located in the Town's Single Family Residential (R-2) zoning district.

The site was developed prior to regulations requiring treatment of stormwater. As such, the existing site provides no treatment to the existing stormwater runoff. There is approximately 0.5 acres or 22,640 sf of untreated impervious runoff discharging from the property. The proposed project area is approximate 0.7 acres and will have minimal impact outside of the building footprint, but stormwater treatment will be provided to collect, retain, and treat the roof runoff from the new building and portions of the existing buildings and proposed site impervious areas.

The proposed project will provide treatment using deep sump catch basins and a sub-surface chamber system for stormwater retention and infiltration. The proposed project will increase the total impervious aera on site by approximately 3,800 square feet with the expansion of the dining hall, outdoor patio area, and revised loading area. The proposed stormwater drainage system will treat approximately 16,620 sf of impervious area, which includes the new building, patio area and portions of the existing buildings that are remaining. The proposed stormwater treatment area is located on the west side of the building in the Ford Quad area, which is higher elevation than the east (Spring Street) side of the site, and the only allowable area for treatment in the project area.

The site's rainfall precipitation results were obtained from the Northeast Regional Climate Center (NRCC) and 15% was added to the rainfall data per NHDES requirement for all New Hampshire seacoast communities. The stormwater management system proposed for the site will reduce peak flows for all storm events analyzed and treat site runoff prior to discharging back to the municipal stormwater system in Spring Street.

Drainage Analysis

A complete summary of the drainage model is included in the appendix of this report. The following table compares pre- and post-development peak rates at the Point of Analysis identified on the plans for the 2, 10, 25, and 50 year storm events, including a 15% increase to the Northeast Regional Climate Center (NRCC) precipitation estimates for the 24 hour storm events:

Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

	2-Yr Storm (3.70 inch)	10-Yr Storm (5.65 inch)	25-Yr Storm (7.19 inch)	50-Yr Storm (8.63 inch)
POA #100				
Pre	3.73	6.96	9.58	12.05
Post	2.96	5.38	7.39	9.32
Net Change	**-0.77 (20.6%)**	**-1.58 (22.7%)**	**-2.19 (22.9%)**	**-2.63 (21.8%)**

As the above table demonstrates, the proposed peak rates of runoff will be reduced by over twenty percent, compared to the existing conditions, for all of the analyzed storm events. This will be a significant improvement to the storm water management for the site.

Pre-Development (Existing Conditions)

The existing site drains to the northeast where stormwater is collected in existing catch basins and transmitted to a drainage manhole in Spring Street. The point of analysis (PA1) is located after the drainage manhole in Spring Street where the untreated stormwater enters the municipal stormwater system. The predevelopment site conditions reflect the existing conditions of the site, which include the two dormitories and dining hall centered between, as well as the dining hall loading area, walkways, and site landscaping.

The Pre-Development analysis models the existing conditions for the point of analysis. The point of analysis remains the same for the pre and post development models for comparison of flows prior to construction and after the site development as shown on the plans. The grades and elevations shown on the plans are based on the site survey completed by Nitsch Engineering dated March 3, 2022 and included in the plan set.

Post-Development (Proposed Site Design)

The proposed project will raze and replace Wetherell Dining Hall, construct an outdoor patio seating area, and improve the loading area. The installation of a stormwater management gallery (SGA) will provide retention and treatment, reduce the peak rate of runoff, promote groundwater recharge, and filter the runoff to improve water quality. The proposed stormwater gallery was sized to provide treatment and retention to all of the new dining hall building, as well as much of the existing Merrill and Langdell buildings. The proposed stormwater system will connect to the 30" main drain line that extends through the project area. The model shows the connection at existing manhole (1P) on the west side of the site in the location of the Ford Quad. Small yard drains are proposed to help with surface drainage but are not individually modeled for the hydraulic analysis. The front of the site will continue to drain to the northeast along Spring Street. All stormwater eventually collects in the municipal stormwater system at the intersection of Spring Street and Main Street, identified as the Pint of Analysis (PA1).

For the post development analysis, the site was divided into three (3) watershed areas to depict the post-development conditions. The same point of analysis (PA1) that was used in the Pre-Development model was used for comparison of the Pre and Post development conditions. The "Grading and Drainage Plan" illustrates the proposed stormwater management system. Site topography, existing features, proposed site improvements, proposed grading, drainage, and erosion control measures are shown on the accompanying plans.

CALCULATION METHODS

The drainage analysis was completed using HydroCAD v.10. The program generates runoff hydrographs for specified storm distributions, and performs reservoir routing using the storage indication method. The criteria used for this drainage analysis are the 2-year, 10-year, 25-year, and 50-year 24-hour Type III frequency storm events based on the Northeast Regional Climate Center "extreme precipitation tables" for Exeter, New Hampshire.

Recommended erosion control measures are based upon the "*New Hampshire Stormwater Manual"*, developed in 2008.

The following modeling conservative data and assumptions were incorporated into the analysis:

- Model based on the extreme precipitation values published by Cornell/UNH for coastal communities.
- Project area soils and hydrological group are based on NRCS Soils mapping.
- Minimum Tc of 6 minutes SCS TR-55 Urban Hydrology for Small Watersheds indicates that the minimum Tc is 0.1 hour or 6 minutes. The Federal Highway Administration Hydraulic Engineering and NHDOT Drainage Design for Highways states that minimum time of concentration (Tc) for urbanized areas should not be less than 5-minutes. Extremely short Tc times can lead to improbable runoff values and is not appropriate for design.

Site Soils

Because the site is completely a previously disturbed area and there is limited work outside of the building footprint, a High Intensity Soil Survey was not completed for the site. The NRCS soils survey was used to identify the soils for the project site, as well as geotechnical borings for the soil descriptions and groundwater elevations. The NRCS soils survey indicates Hoosic soils, a very well drained soil (HSG A), in the project area. Because the site is previously disturbed, HSG B was used for the hydraulic modeling. For infiltration design rates, an infiltration test was conducted at SWG A and a rate of 4.4 in/hr was determined. This rate is used in the modeling.

Pollutant Removal Efficiency

The retention and treatment methods used in this design include deep sump catch basins with hoods as well as sub-surface stormwater treatment systems (stormwater galleries). The pollutant removal efficiencies for these Best Management Practices are listed in the table below and were sourced from the "New Hampshire Stormwater Management Manual Volume 2".

BMP Pollutant Removal Efficiency

BMP	TSS	TN	TP
Deep Sump Catch Basin	15%	5%	5%
Sub-Surface Chamber System	90%	60%	65%

TSS = Total Suspended Solids
TN = Total Nitrogen
TP = Total Phosphorus

CONCLUSION

The proposed dining hall and renovation of the existing dormitories will not have an adverse effect on abutting properties and infrastructure as a result of stormwater runoff. The existing site has no designed stormwater treatment facilities. The new development will provide stormwater treatment for approximately 16,620 square feet of impervious area with the construction of a stormwater drainage system using subsurface chamber system. The analysis of the site shows that the peak runoff rates for the site will be reduced for all storm events by over 20%, including the 50-year storm. Appropriate steps will be taken during construction to properly mitigate erosion and sedimentation using Best Management Practices for sediment and erosion control.

Disclaimer

Altus Engineering, Inc. notes that stormwater modeling is limited in its capacity to precisely predict peak rates of runoff and flood elevations. Results should not be considered to represent actual storm events due to the number of variables and assumptions involved in the modeling effort. Surface roughness coefficients (n), entrance loss coefficients (ke), velocity factors (kv) and times of concentration (Tc) are based on subjective field observations and engineering judgment using available data. For design purposes, curve numbers (Cn) describe the average conditions. However, curve numbers will vary from storm to storm depending on the antecedent runoff conditions (ARC) including saturation and frozen ground. Also, higher water elevations than predicted by modeling could occur if drainage channels, closed drain systems or culverts are not maintained and/or become blocked by debris before and/or during a storm event as this will impact flow capacity of the structures. Structures should be re-evaluated if future changes occur within relevant drainage areas in order to assess any required design modifications.

Soil Map—Rockingham County, New Hampshire
(MWL - Spring St ,Exeter, NH)

Map Scale: 1:1,060 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 24, Aug 31, 2021

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

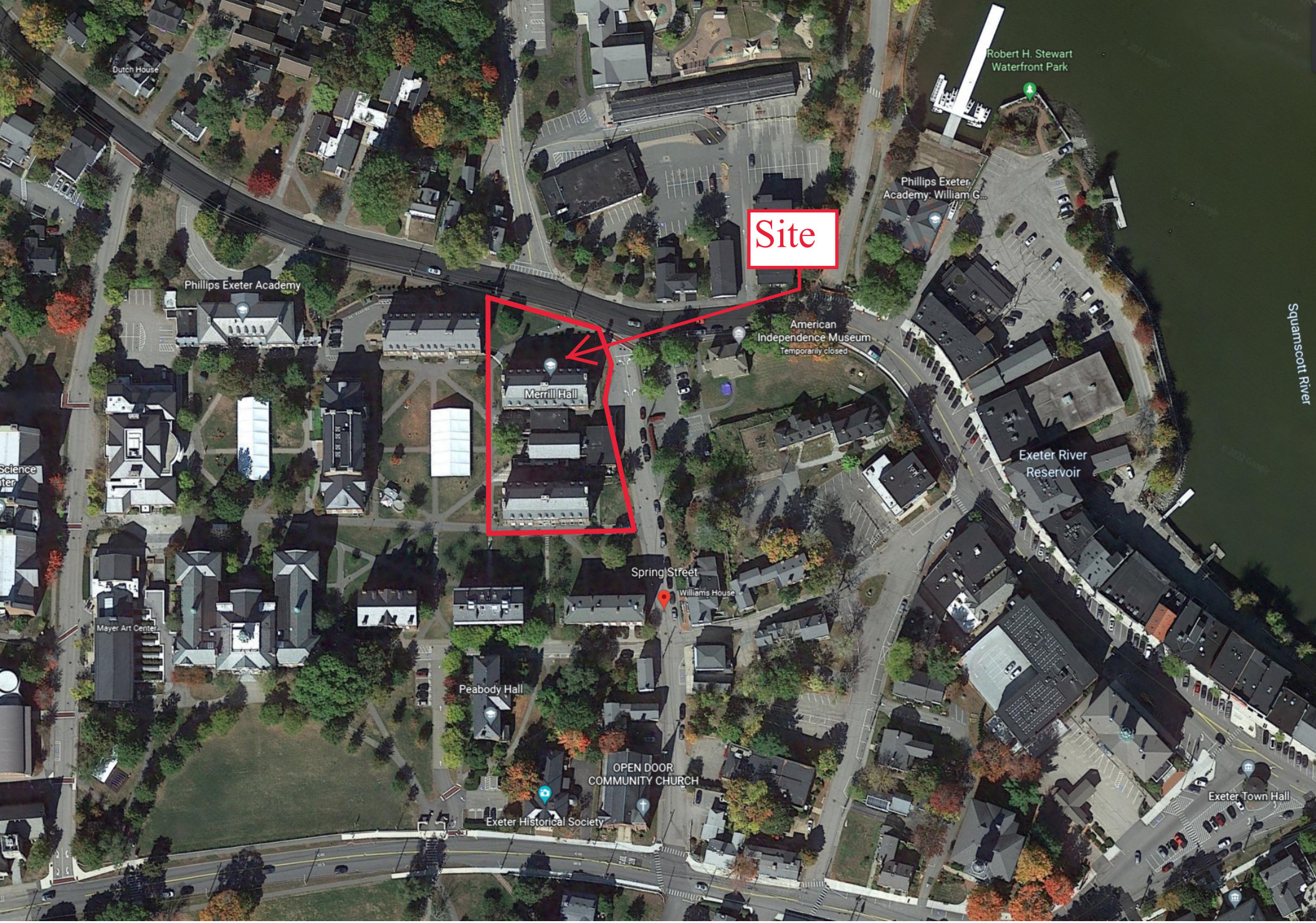
Date(s) aerial images were photographed: Dec 31, 2009—Sep 12, 2016

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
599	Urban land-Hoosic complex, 3 to 15 percent slopes	2.3	100.0%
Totals for Area of Interest		**2.3**	**100.0%**

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Fryeburg	208	0.6	2.0	2.00	6.0	B	2	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Gilmanton	478	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Glebe	671	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Gloucester	11	6.0	20.0	6.00	20.0	A	1	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Glover	NA	0.6	2.0	0.60	2	D	4	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep
Grange	433	0.6	2.0	0.60	2.0	C	5	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Greenwood	295					A/D	6	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Groveton	27	0.6	2.0	0.60	6.0	B	2	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Hadley	8	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Hadley	108	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Hartland	31	0.6	2.0	0.20	2.0	B	2	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Haven	410	0.6	2.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Henniker	46	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Hermon	55	2.0	20.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Hinckley	12	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Hitchcock	130	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Hogback	91	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Hollis	86	0.6	6.0	0.60	6.0	C/D	4	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Hoosic	510	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Houghtonville	795	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Howland	566	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Ipswich	397					D	6	Tidal Flat	mesic	hemic/sapric	no	deep organic
Kearsarge	359	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Kinsman	614	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Lanesboro	228	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Leicester	514	0.6	6.0	0.60	20.0	C	5	Loose till, loamy textures	mesic	loamy	no	
Lim	3	0.6	2.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Limerick	109	0.6	2.0	0.60	2.0	C	5	Flood Plain (Bottom Land)	mesic	silty	no	
Lombard	259	0.6	6.0	2.00	20.0	C/D	2	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Lovewell	307	0.6	2.0	0.60	2.0	B	3	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Lyman	92	2.0	6.0	2.00	6.0	A/D	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Lyme	246	0.6	6.0	0.60	6.0	C	5	Loose till, sandy textures	frigid	loamy	no	
Machias	520	2.0	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Macomber	252	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Madawaska	28	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Madawaska, aquer	48	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Marlow	76	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Masardis	23	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Mashpee	315	6.0	20.0	6.00	20.0	B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Matunuck	797			20.00	100.0	D	6	Tidal Flat	mesic	sandy	no	organic over sand
Maybid	134	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	mesic	fine	no	silt over clay
Meadowsedge	894					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Medomak	406	0.6	2.0	0.60	2.0	D	6	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Melrose	37	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Merrimac	10	2.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Metacomet	458	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Metallak	404	6.0	100.0	6.00	100.0	B	3	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Millis	39					C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Millsite	251	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Monadnock	142	0.6	2.0	2.00	6.0	B	2	Loose till, sandy textures	frigid	oamy over sandy, sandy-skeleta	yes	gravelly loamy sand in C
Monarda	569	0.2	2.0	0.02	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Monson	133	0.6	2.0	0.60	2.0	D	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Montauk	44	0.6	6.0	0.06	0.6	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Moosilauke	414	6.0	20.0	6.00	20.0	C	5	Loose till, sandy textures	frigid	sandy	no	



Google Earth Aerial Image

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.951 degrees West
Latitude	42.983 degrees North
Elevation	0 feet
Date/Time	Tue, 05 Jul 2022 15:16:13 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.66	0.82	1.04	**1yr**	0.71	0.99	1.22	1.57	2.04	2.68	2.90	**1yr**	2.37	2.79	3.20	3.91	4.53	**1yr**
2yr	0.32	0.50	0.62	0.82	1.03	1.30	**2yr**	0.89	1.18	1.52	1.94	2.49	3.21	3.56	**2yr**	2.84	3.43	3.94	4.67	5.32	**2yr**
5yr	0.38	0.58	0.73	0.98	1.26	1.62	**5yr**	1.08	1.47	1.90	2.45	3.16	4.09	4.58	**5yr**	3.62	4.41	5.04	5.96	6.74	**5yr**
10yr	0.42	0.66	0.83	1.13	1.46	1.91	**10yr**	1.26	1.73	2.25	2.92	3.78	4.90	5.55	**10yr**	4.34	5.33	6.08	7.18	8.06	**10yr**
25yr	0.49	0.77	0.98	1.35	1.80	2.37	**25yr**	1.55	2.16	2.81	3.67	4.79	6.24	7.14	**25yr**	5.52	6.87	7.78	9.19	10.22	**25yr**
50yr	0.55	0.87	1.12	1.56	2.11	2.80	**50yr**	1.82	2.55	3.34	4.39	5.75	7.49	8.65	**50yr**	6.63	8.32	9.39	11.07	12.24	**50yr**
100yr	0.61	0.99	1.27	1.81	2.47	3.32	**100yr**	2.13	3.01	3.98	5.25	6.89	8.99	10.49	**100yr**	7.96	10.08	11.33	13.35	14.66	**100yr**
200yr	0.69	1.13	1.46	2.09	2.89	3.92	**200yr**	2.50	3.56	4.72	6.26	8.24	10.81	12.71	**200yr**	9.56	12.22	13.68	16.11	17.57	**200yr**
500yr	0.81	1.34	1.75	2.55	3.57	4.90	**500yr**	3.08	4.44	5.93	7.92	10.47	13.78	16.39	**500yr**	12.20	15.76	17.55	20.67	22.34	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.61	0.75	0.89	**1yr**	0.65	0.87	0.95	1.25	1.53	2.29	2.53	**1yr**	2.03	2.44	2.89	3.44	4.02	**1yr**
2yr	0.32	0.49	0.60	0.82	1.01	1.19	**2yr**	0.87	1.16	1.37	1.82	2.33	3.11	3.48	**2yr**	2.75	3.35	3.84	4.55	5.13	**2yr**
5yr	0.36	0.55	0.68	0.94	1.19	1.42	**5yr**	1.03	1.39	1.62	2.12	2.73	3.80	4.24	**5yr**	3.36	4.08	4.68	5.61	6.29	**5yr**
10yr	0.40	0.61	0.75	1.05	1.36	1.63	**10yr**	1.17	1.59	1.82	2.40	3.07	4.37	4.92	**10yr**	3.87	4.73	5.43	6.53	7.22	**10yr**
25yr	0.46	0.69	0.86	1.23	1.62	1.95	**25yr**	1.40	1.91	2.12	2.78	3.58	4.94	5.97	**25yr**	4.37	5.74	6.58	7.98	8.90	**25yr**
50yr	0.51	0.77	0.96	1.38	1.86	2.25	**50yr**	1.60	2.20	2.36	3.12	4.01	5.59	6.89	**50yr**	4.94	6.63	7.61	9.29	10.28	**50yr**
100yr	0.57	0.86	1.08	1.56	2.13	2.58	**100yr**	1.84	2.53	2.65	3.49	4.48	6.30	7.95	**100yr**	5.58	7.64	8.80	10.80	11.86	**100yr**
200yr	0.64	0.96	1.21	1.76	2.45	2.97	**200yr**	2.12	2.90	2.95	3.89	5.01	7.07	9.71	**200yr**	6.26	9.34	10.18	12.56	13.71	**200yr**
500yr	0.75	1.12	1.44	2.08	2.96	3.59	**500yr**	2.56	3.51	3.42	4.49	5.83	8.21	11.89	**500yr**	7.26	11.43	12.33	15.30	16.57	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.76	1.06	1.26	1.71	2.16	2.96	3.13	**1yr**	2.62	3.01	3.55	4.27	4.97	**1yr**
2yr	0.33	0.51	0.63	0.86	1.05	1.26	**2yr**	0.91	1.23	1.48	1.94	2.48	3.38	3.67	**2yr**	2.99	3.53	4.06	4.85	5.61	**2yr**
5yr	0.40	0.62	0.77	1.06	1.34	1.61	**5yr**	1.16	1.58	1.87	2.48	3.16	4.38	4.94	**5yr**	3.88	4.75	5.43	6.34	7.22	**5yr**
10yr	0.48	0.73	0.91	1.27	1.64	1.97	**10yr**	1.41	1.93	2.26	3.02	3.80	5.46	6.21	**10yr**	4.83	5.97	6.80	7.86	8.91	**10yr**
25yr	0.59	0.90	1.11	1.59	2.09	2.56	**25yr**	1.81	2.50	2.93	3.91	4.87	7.60	8.42	**25yr**	6.73	8.10	9.15	10.47	11.51	**25yr**
50yr	0.69	1.05	1.31	1.88	2.53	3.11	**50yr**	2.18	3.04	3.56	4.76	5.89	9.53	10.62	**50yr**	8.43	10.22	11.49	13.02	14.15	**50yr**
100yr	0.81	1.23	1.54	2.23	3.05	3.78	**100yr**	2.63	3.70	4.33	5.82	7.14	11.95	13.40	**100yr**	10.58	12.89	14.39	16.23	17.42	**100yr**
200yr	0.96	1.44	1.82	2.64	3.68	4.61	**200yr**	3.18	4.51	5.29	7.10	8.63	15.04	16.05	**200yr**	13.31	15.43	18.08	20.20	21.45	**200yr**
500yr	1.19	1.77	2.28	3.31	4.71	5.97	**500yr**	4.06	5.84	6.87	9.27	11.13	20.41	21.62	**500yr**	18.07	20.79	24.40	27.04	28.32	**500yr**

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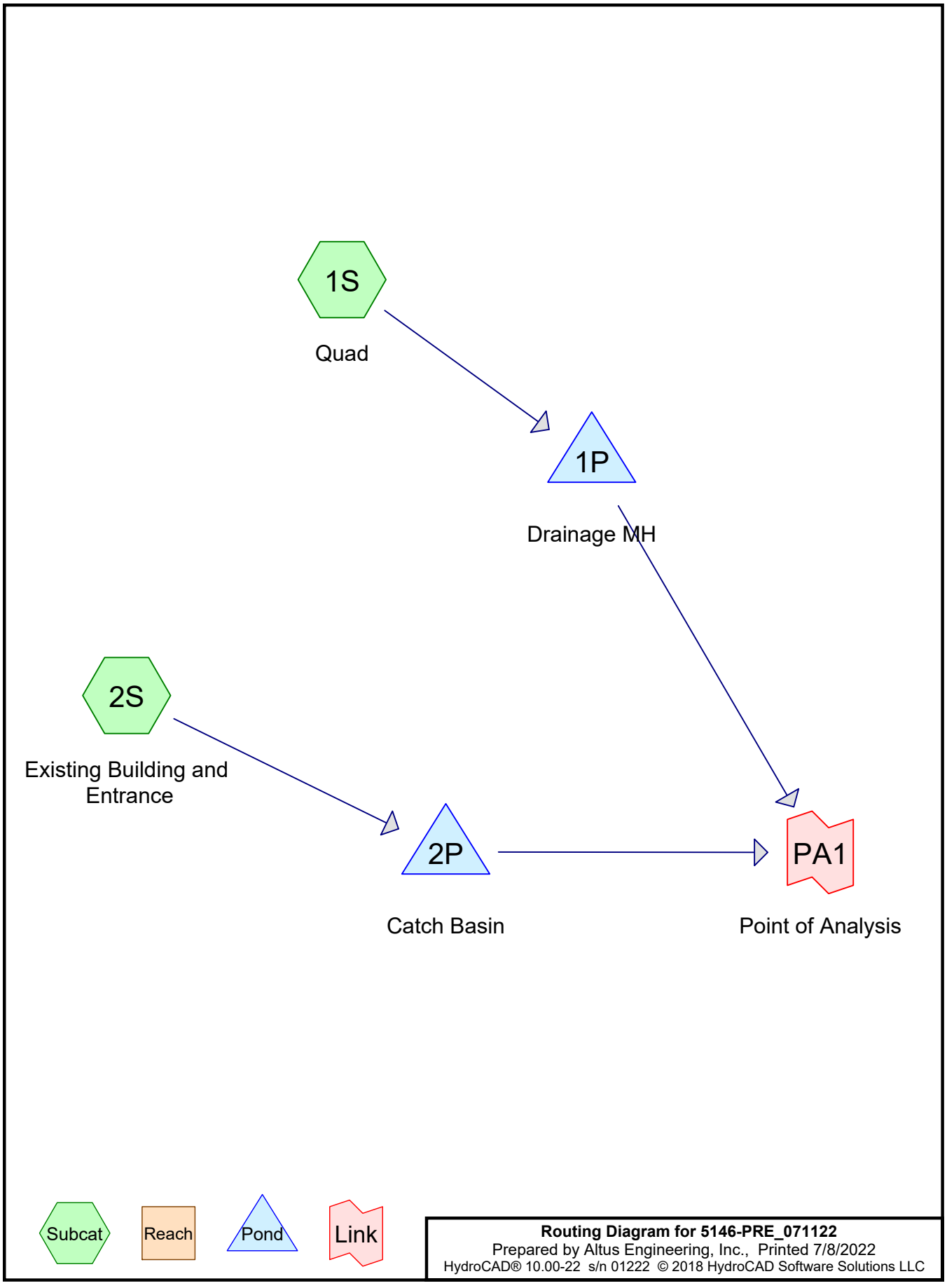
Northeast Regional Climate Center



Routing Diagram for 5146-PRE_071122
Prepared by Altus Engineering, Inc., Printed 7/8/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.503	61	>75% Grass cover, Good, HSG B (1S, 2S)
0.020	98	Paved parking, HSG B (2S)
0.019	98	Roofs, HSG C (1S)
0.237	98	Unconnected pavement, HSG B (1S, 2S)
0.244	98	Unconnected roofs, HSG B (2S)
1.023	**80**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.004	HSG B	1S, 2S
0.019	HSG C	1S
0.000	HSG D	
0.000	Other	
1.023		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.503	0.000	0.000	0.000	0.503	>75% Grass cover, Good	1S, 2S
0.000	0.020	0.000	0.000	0.000	0.020	Paved parking	2S
0.000	0.000	0.019	0.000	0.000	0.019	Roofs	1S
0.000	0.237	0.000	0.000	0.000	0.237	Unconnected pavement	1S, 2S
0.000	0.244	0.000	0.000	0.000	0.244	Unconnected roofs	2S
0.000	**1.004**	**0.019**	**0.000**	**0.000**	**1.023**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	4.90	3.90	186.0	0.0054	0.013	30.0	0.0	0.0
2	2P	6.00	4.40	42.0	0.0381	0.011	18.0	0.0	0.0

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Drainage MH Peak Elev=5.68' Storage=0.001 af Inflow=3.36 cfs 0.137 af
30.0" Round Culvert n=0.013 L=186.0' S=0.0054 '/' Outflow=3.35 cfs 0.137 af

Subcatchment 1S: Quad Runoff Area=24,777 sf 34.23% Impervious Runoff Depth=2.89"
Tc=0.0 min CN=74 Runoff=3.36 cfs 0.137 af

Pond 2P: Catch Basin Peak Elev=6.91' Storage=0.001 af Inflow=3.63 cfs 0.158 af
18.0" Round Culvert n=0.011 L=42.0' S=0.0381 '/' Outflow=3.61 cfs 0.158 af

Subcatchment 2S: Existing Building and Runoff Area=19,775 sf 71.59% Impervious Runoff Depth=4.18"
Tc=0.0 min CN=87 Runoff=3.63 cfs 0.158 af

Link PA1: Point of Analysis Inflow=6.96 cfs 0.295 af
Primary=6.96 cfs 0.295 af

Total Runoff Area = 1.023 ac Runoff Volume = 0.295 af Average Runoff Depth = 3.47"
49.19% Pervious = 0.503 ac 50.81% Impervious = 0.520 ac

Summary for Pond 1P: Drainage MH

Inflow Area = 0.569 ac, 34.23% Impervious, Inflow Depth = 2.89" for 10-yr event
Inflow = 3.36 cfs @ 11.89 hrs, Volume= 0.137 af
Outflow = 3.35 cfs @ 11.89 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min
Primary = 3.35 cfs @ 11.89 hrs, Volume= 0.137 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 5.68' @ 11.89 hrs Surf.Area= 0.001 ac Storage= 0.001 af

Plug-Flow detention time= 0.4 min calculated for 0.137 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (823.2 - 822.8)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	0.010 af	**6.00'D x 15.11'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	4.90'	**30.0" Round RCP_Round 30"** L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 4.90' / 3.90' S= 0.0054 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf

Primary OutFlow Max=3.23 cfs @ 11.89 hrs HW=5.67' (Free Discharge)
↑**1=RCP_Round 30"** (Barrel Controls 3.23 cfs @ 3.78 fps)

Summary for Subcatchment 1S: Quad

Runoff = 3.36 cfs @ 11.89 hrs, Volume= 0.137 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=5.65"

Area (sf)	CN	Description
829	98	Roofs, HSG C
7,651	98	Unconnected pavement, HSG B
16,297	61	>75% Grass cover, Good, HSG B
24,777	74	Weighted Average
16,297		65.77% Pervious Area
8,480		34.23% Impervious Area
7,651		90.22% Unconnected

Summary for Pond 2P: Catch Basin

Inflow Area = 0.454 ac, 71.59% Impervious, Inflow Depth = 4.18" for 10-yr event
Inflow = 3.63 cfs @ 11.89 hrs, Volume= 0.158 af
Outflow = 3.61 cfs @ 11.89 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min
Primary = 3.61 cfs @ 11.89 hrs, Volume= 0.158 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 6.91' @ 11.89 hrs Surf.Area= 0.001 ac Storage= 0.001 af

Plug-Flow detention time= 0.5 min calculated for 0.158 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (788.6 - 788.1)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.002 af	**6.00'D x 3.58'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.00'	**18.0" Round Culvert** L= 42.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.00' / 4.40' S= 0.0381 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.46 cfs @ 11.89 hrs HW=6.88' (Free Discharge)
1=Culvert (Inlet Controls 3.46 cfs @ 3.20 fps)

Summary for Subcatchment 2S: Existing Building and Entrance

Runoff = 3.63 cfs @ 11.89 hrs, Volume= 0.158 af, Depth= 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=5.65"

Area (sf)	CN	Description
10,610	98	Unconnected roofs, HSG B
883	98	Paved parking, HSG B
0	96	Gravel surface, HSG B
2,664	98	Unconnected pavement, HSG B
5,618	61	>75% Grass cover, Good, HSG B
19,775	87	Weighted Average
5,618		28.41% Pervious Area
14,157		71.59% Impervious Area
13,274		93.76% Unconnected

Summary for Link PA1: Point of Analysis

Inflow Area = 1.023 ac, 50.81% Impervious, Inflow Depth = 3.47" for 10-yr event
Inflow = 6.96 cfs @ 11.89 hrs, Volume= 0.295 af
Primary = 6.96 cfs @ 11.89 hrs, Volume= 0.295 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	4.90	3.90	186.0	0.0054	0.013	30.0	0.0	0.0
2	2P	6.00	4.40	42.0	0.0381	0.011	18.0	0.0	0.0

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Drainage MH Peak Elev=5.43' Storage=0.000 af Inflow=1.62 cfs 0.065 af
30.0" Round Culvert n=0.013 L=186.0' S=0.0054 '/' Outflow=1.62 cfs 0.065 af

Subcatchment 1S: Quad Runoff Area=24,777 sf 34.23% Impervious Runoff Depth=1.38"
Tc=0.0 min CN=74 Runoff=1.62 cfs 0.065 af

Pond 2P: Catch Basin Peak Elev=6.67' Storage=0.000 af Inflow=2.13 cfs 0.089 af
18.0" Round Culvert n=0.011 L=42.0' S=0.0381 '/' Outflow=2.11 cfs 0.089 af

Subcatchment 2S: Existing Building and Runoff Area=19,775 sf 71.59% Impervious Runoff Depth=2.36"
Tc=0.0 min CN=87 Runoff=2.13 cfs 0.089 af

Link PA1: Point of Analysis Inflow=3.73 cfs 0.155 af
Primary=3.73 cfs 0.155 af

Total Runoff Area = 1.023 ac Runoff Volume = 0.155 af Average Runoff Depth = 1.82"
49.19% Pervious = 0.503 ac 50.81% Impervious = 0.520 ac

Summary for Pond 1P: Drainage MH

Inflow Area = 0.569 ac, 34.23% Impervious, Inflow Depth = 1.38" for 2-yr event
Inflow = 1.62 cfs @ 11.90 hrs, Volume= 0.065 af
Outflow = 1.62 cfs @ 11.90 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.1 min
Primary = 1.62 cfs @ 11.90 hrs, Volume= 0.065 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 5.43' @ 11.90 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= 0.4 min calculated for 0.065 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (844.9 - 844.4)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	0.010 af	**6.00'D x 15.11'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	4.90'	**30.0" Round RCP_Round 30"** L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 4.90' / 3.90' S= 0.0054 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf

Primary OutFlow Max=1.56 cfs @ 11.90 hrs HW=5.43' (Free Discharge)
1=RCP_Round 30" (Barrel Controls 1.56 cfs @ 3.12 fps)

Summary for Subcatchment 1S: Quad

Runoff = 1.62 cfs @ 11.90 hrs, Volume= 0.065 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.70"

Area (sf)	CN	Description
829	98	Roofs, HSG C
7,651	98	Unconnected pavement, HSG B
16,297	61	>75% Grass cover, Good, HSG B
24,777	74	Weighted Average
16,297		65.77% Pervious Area
8,480		34.23% Impervious Area
7,651		90.22% Unconnected

Summary for Pond 2P: Catch Basin

Inflow Area = 0.454 ac, 71.59% Impervious, Inflow Depth = 2.36" for 2-yr event
Inflow = 2.13 cfs @ 11.89 hrs, Volume= 0.089 af
Outflow = 2.11 cfs @ 11.89 hrs, Volume= 0.089 af, Atten= 1%, Lag= 0.1 min
Primary = 2.11 cfs @ 11.89 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 6.67' @ 11.89 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= 0.6 min calculated for 0.089 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (804.9 - 804.2)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.002 af	**6.00'D x 3.58'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.00'	**18.0" Round Culvert** L= 42.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.00' / 4.40' S= 0.0381 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.03 cfs @ 11.89 hrs HW=6.65' (Free Discharge)
1=Culvert (Inlet Controls 2.03 cfs @ 2.75 fps)

Summary for Subcatchment 2S: Existing Building and Entrance

Runoff = 2.13 cfs @ 11.89 hrs, Volume= 0.089 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.70"

Area (sf)	CN	Description
10,610	98	Unconnected roofs, HSG B
883	98	Paved parking, HSG B
0	96	Gravel surface, HSG B
2,664	98	Unconnected pavement, HSG B
5,618	61	>75% Grass cover, Good, HSG B
19,775	87	Weighted Average
5,618		28.41% Pervious Area
14,157		71.59% Impervious Area
13,274		93.76% Unconnected

Summary for Link PA1: Point of Analysis

Inflow Area = 1.023 ac, 50.81% Impervious, Inflow Depth = 1.82" for 2-yr event
Inflow = 3.73 cfs @ 11.89 hrs, Volume= 0.155 af
Primary = 3.73 cfs @ 11.89 hrs, Volume= 0.155 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Drainage MH Peak Elev=5.84' Storage=0.001 af Inflow=4.82 cfs 0.199 af
30.0" Round Culvert n=0.013 L=186.0' S=0.0054 '/' Outflow=4.80 cfs 0.199 af

Subcatchment 1S: Quad Runoff Area=24,777 sf 34.23% Impervious Runoff Depth=4.21"
Tc=0.0 min CN=74 Runoff=4.82 cfs 0.199 af

Pond 2P: Catch Basin Peak Elev=7.08' Storage=0.001 af Inflow=4.81 cfs 0.214 af
18.0" Round Culvert n=0.011 L=42.0' S=0.0381 '/' Outflow=4.79 cfs 0.214 af

Subcatchment 2S: Existing Building and Runoff Area=19,775 sf 71.59% Impervious Runoff Depth=5.66"
Tc=0.0 min CN=87 Runoff=4.81 cfs 0.214 af

Link PA1: Point of Analysis Inflow=9.58 cfs 0.414 af
Primary=9.58 cfs 0.414 af

Total Runoff Area = 1.023 ac Runoff Volume = 0.414 af Average Runoff Depth = 4.85"
49.19% Pervious = 0.503 ac 50.81% Impervious = 0.520 ac

Summary for Pond 1P: Drainage MH

Inflow Area = 0.569 ac, 34.23% Impervious, Inflow Depth = 4.21" for 25-yr event
Inflow = 4.82 cfs @ 11.89 hrs, Volume= 0.199 af
Outflow = 4.80 cfs @ 11.89 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.0 min
Primary = 4.80 cfs @ 11.89 hrs, Volume= 0.199 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 5.84' @ 11.89 hrs Surf.Area= 0.001 ac Storage= 0.001 af

Plug-Flow detention time= 0.3 min calculated for 0.199 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (812.5 - 812.2)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	0.010 af	**6.00'D x 15.11'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	4.90'	**30.0" Round RCP_Round 30"** L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 4.90' / 3.90' S= 0.0054 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf

Primary OutFlow Max=4.61 cfs @ 11.89 hrs HW=5.83' (Free Discharge)
1=RCP_Round 30" (Barrel Controls 4.61 cfs @ 4.15 fps)

Summary for Subcatchment 1S: Quad

Runoff = 4.82 cfs @ 11.89 hrs, Volume= 0.199 af, Depth= 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=7.19"

Area (sf)	CN	Description
829	98	Roofs, HSG C
7,651	98	Unconnected pavement, HSG B
16,297	61	>75% Grass cover, Good, HSG B
24,777	74	Weighted Average
16,297		65.77% Pervious Area
8,480		34.23% Impervious Area
7,651		90.22% Unconnected

Summary for Pond 2P: Catch Basin

Inflow Area = 0.454 ac, 71.59% Impervious, Inflow Depth = 5.66" for 25-yr event
Inflow = 4.81 cfs @ 11.89 hrs, Volume= 0.214 af
Outflow = 4.79 cfs @ 11.89 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min
Primary = 4.79 cfs @ 11.89 hrs, Volume= 0.214 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 7.08' @ 11.89 hrs Surf.Area= 0.001 ac Storage= 0.001 af

Plug-Flow detention time= 0.4 min calculated for 0.214 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (780.1 - 779.7)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.002 af	**6.00'D x 3.58'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.00'	**18.0" Round Culvert** L= 42.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.00' / 4.40' S= 0.0381 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.58 cfs @ 11.89 hrs HW=7.05' (Free Discharge)
1=Culvert (Inlet Controls 4.58 cfs @ 3.48 fps)

Summary for Subcatchment 2S: Existing Building and Entrance

Runoff = 4.81 cfs @ 11.89 hrs, Volume= 0.214 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=7.19"

Area (sf)	CN	Description
10,610	98	Unconnected roofs, HSG B
883	98	Paved parking, HSG B
0	96	Gravel surface, HSG B
2,664	98	Unconnected pavement, HSG B
5,618	61	>75% Grass cover, Good, HSG B
19,775	87	Weighted Average
5,618		28.41% Pervious Area
14,157		71.59% Impervious Area
13,274		93.76% Unconnected

Summary for Link PA1: Point of Analysis

Inflow Area = 1.023 ac, 50.81% Impervious, Inflow Depth = 4.85" for 25-yr event
Inflow = 9.58 cfs @ 11.89 hrs, Volume= 0.414 af
Primary = 9.58 cfs @ 11.89 hrs, Volume= 0.414 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Drainage MH Peak Elev=5.98' Storage=0.001 af Inflow=6.20 cfs 0.260 af
30.0" Round Culvert n=0.013 L=186.0' S=0.0054 '/' Outflow=6.18 cfs 0.260 af

Subcatchment 1S: Quad Runoff Area=24,777 sf 34.23% Impervious Runoff Depth=5.49"
Tc=0.0 min CN=74 Runoff=6.20 cfs 0.260 af

Pond 2P: Catch Basin Peak Elev=7.23' Storage=0.001 af Inflow=5.90 cfs 0.267 af
18.0" Round Culvert n=0.011 L=42.0' S=0.0381 '/' Outflow=5.88 cfs 0.267 af

Subcatchment 2S: Existing Building and Runoff Area=19,775 sf 71.59% Impervious Runoff Depth=7.06"
Tc=0.0 min CN=87 Runoff=5.90 cfs 0.267 af

Link PA1: Point of Analysis Inflow=12.05 cfs 0.528 af
Primary=12.05 cfs 0.528 af

Total Runoff Area = 1.023 ac Runoff Volume = 0.528 af Average Runoff Depth = 6.19"
49.19% Pervious = 0.503 ac 50.81% Impervious = 0.520 ac

Summary for Pond 1P: Drainage MH

Inflow Area = 0.569 ac, 34.23% Impervious, Inflow Depth = 5.49" for 50-yr event
Inflow = 6.20 cfs @ 11.89 hrs, Volume= 0.260 af
Outflow = 6.18 cfs @ 11.89 hrs, Volume= 0.260 af, Atten= 0%, Lag= 0.0 min
Primary = 6.18 cfs @ 11.89 hrs, Volume= 0.260 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 5.98' @ 11.89 hrs Surf.Area= 0.001 ac Storage= 0.001 af

Plug-Flow detention time= 0.3 min calculated for 0.260 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (804.9 - 804.6)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	0.010 af	**6.00'D x 15.11'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	4.90'	**30.0" Round RCP_Round 30"** L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 4.90' / 3.90' S= 0.0054 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf

Primary OutFlow Max=5.93 cfs @ 11.89 hrs HW=5.96' (Free Discharge)
1=RCP_Round 30" (Barrel Controls 5.93 cfs @ 4.41 fps)

Summary for Subcatchment 1S: Quad

Runoff = 6.20 cfs @ 11.89 hrs, Volume= 0.260 af, Depth= 5.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=8.63"

Area (sf)	CN	Description
829	98	Roofs, HSG C
7,651	98	Unconnected pavement, HSG B
16,297	61	>75% Grass cover, Good, HSG B
24,777	74	Weighted Average
16,297		65.77% Pervious Area
8,480		34.23% Impervious Area
7,651		90.22% Unconnected

Summary for Pond 2P: Catch Basin

Inflow Area = 0.454 ac, 71.59% Impervious, Inflow Depth = 7.06" for 50-yr event
Inflow = 5.90 cfs @ 11.89 hrs, Volume= 0.267 af
Outflow = 5.88 cfs @ 11.89 hrs, Volume= 0.267 af, Atten= 0%, Lag= 0.0 min
Primary = 5.88 cfs @ 11.89 hrs, Volume= 0.267 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 7.23' @ 11.89 hrs Surf.Area= 0.001 ac Storage= 0.001 af

Plug-Flow detention time= 0.4 min calculated for 0.267 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (774.1 - 773.7)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.002 af	**6.00'D x 3.58'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.00'	**18.0" Round Culvert** L= 42.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.00' / 4.40' S= 0.0381 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.62 cfs @ 11.89 hrs HW=7.20' (Free Discharge)
1=Culvert (Inlet Controls 5.62 cfs @ 3.72 fps)

Summary for Subcatchment 2S: Existing Building and Entrance

Runoff = 5.90 cfs @ 11.89 hrs, Volume= 0.267 af, Depth= 7.06"

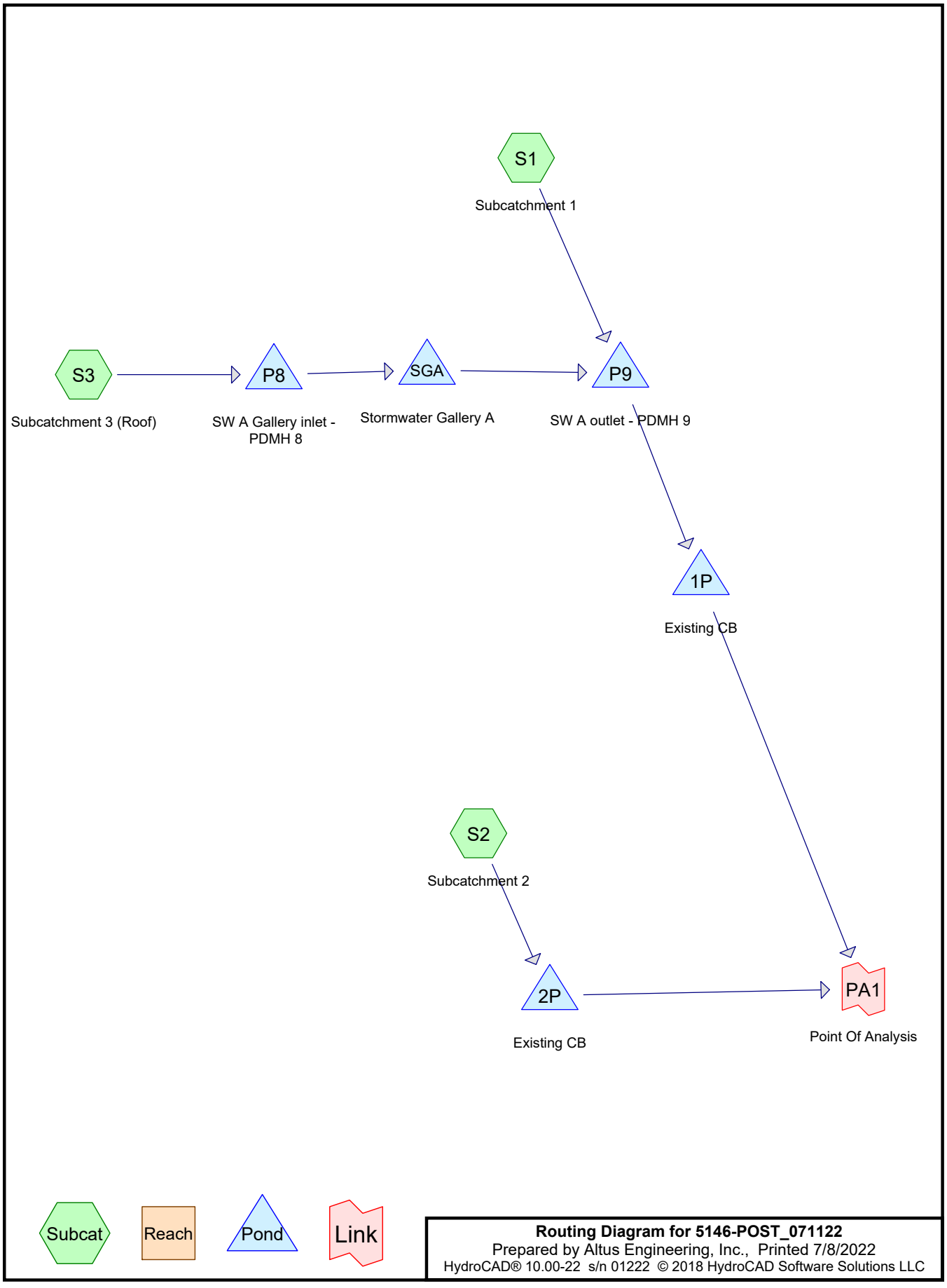
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=8.63"

Area (sf)	CN	Description
10,610	98	Unconnected roofs, HSG B
883	98	Paved parking, HSG B
0	96	Gravel surface, HSG B
2,664	98	Unconnected pavement, HSG B
5,618	61	>75% Grass cover, Good, HSG B
19,775	87	Weighted Average
5,618		28.41% Pervious Area
14,157		71.59% Impervious Area
13,274		93.76% Unconnected

Summary for Link PA1: Point of Analysis

Inflow Area = 1.023 ac, 50.81% Impervious, Inflow Depth = 6.19" for 50-yr event
Inflow = 12.05 cfs @ 11.89 hrs, Volume= 0.528 af
Primary = 12.05 cfs @ 11.89 hrs, Volume= 0.528 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



Routing Diagram for 5146-POST_071122
Prepared by Altus Engineering, Inc., Printed 7/8/2022

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.388	61	>75% Grass cover, Good, HSG B (S1, S2)
0.060	98	Concrete Patio, HSG B (S3)
0.027	82	Patio, HSG B (S3)
0.212	98	Unconnected pavement, HSG B (S1, S2)
0.335	98	Unconnected roofs, HSG B (S3)
1.022	**84**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.022	HSG B	S1, S2, S3
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.022		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.388	0.000	0.000	0.000	0.388	>75% Grass cover, Good	S1, S2
0.000	0.060	0.000	0.000	0.000	0.060	Concrete Patio	S3
0.000	0.027	0.000	0.000	0.000	0.027	Patio	S3
0.000	0.212	0.000	0.000	0.000	0.212	Unconnected pavement	S1, S2
0.000	0.335	0.000	0.000	0.000	0.335	Unconnected roofs	S3
0.000	**1.022**	**0.000**	**0.000**	**0.000**	**1.022**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	4.90	3.90	186.0	0.0054	0.013	30.0	0.0	0.0
2	2P	6.00	4.40	42.0	0.0381	0.011	18.0	0.0	0.0
3	P8	16.10	16.00	5.0	0.0200	0.012	12.0	0.0	0.0
4	P9	15.30	15.00	20.0	0.0150	0.012	15.0	0.0	0.0
5	SGA	16.75	16.50	5.0	0.0500	0.012	15.0	0.0	0.0

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Existing CB Peak Elev=5.81' Storage=0.001 af Inflow=4.46 cfs 0.170 af
30.0" Round Culvert n=0.013 L=186.0' S=0.0054 '/' Outflow=4.45 cfs 0.170 af

Pond 2P: Existing CB Peak Elev=6.43' Storage=0.000 af Inflow=0.94 cfs 0.046 af
18.0" Round Culvert n=0.011 L=42.0' S=0.0381 '/' Outflow=0.94 cfs 0.046 af

Pond P8: SW A Gallery inlet - PDMH 8 Peak Elev=17.43' Storage=17 cf Inflow=3.29 cfs 0.186 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0200 '/' Outflow=3.28 cfs 0.186 af

Pond P9: SW A outlet - PDMH 9 Peak Elev=16.52' Storage=15 cf Inflow=4.47 cfs 0.170 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0150 '/' Outflow=4.46 cfs 0.170 af

Link PA1: Point Of Analysis Inflow=5.38 cfs 0.216 af
Primary=5.38 cfs 0.216 af

Subcatchment S1: Subcatchment 1 Runoff Area=19,123 sf 29.58% Impervious Runoff Depth=2.18"
Tc=10.0 min UI Adjusted CN=66 Runoff=1.44 cfs 0.080 af

Subcatchment S2: Subcatchment 2 Runoff Area=7,004 sf 51.13% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=80 Runoff=0.94 cfs 0.046 af

Subcatchment S3: Subcatchment 3 (Roof) Runoff Area=18,390 sf 93.53% Impervious Runoff Depth=5.30"
Tc=6.0 min CN=97 Runoff=3.29 cfs 0.186 af

Pond SGA: Stormwater Gallery A Peak Elev=17.68' Storage=1,048 cf Inflow=3.28 cfs 0.186 af
Discarded=0.08 cfs 0.097 af Primary=3.11 cfs 0.090 af Outflow=3.19 cfs 0.186 af

Total Runoff Area = 1.022 ac Runoff Volume = 0.313 af Average Runoff Depth = 3.67"
40.61% Pervious = 0.415 ac 59.39% Impervious = 0.607 ac

Summary for Pond 1P: Existing CB

Inflow Area = 0.861 ac, 60.93% Impervious, Inflow Depth = 2.37" for 10-yr event
Inflow = 4.46 cfs @ 11.99 hrs, Volume= 0.170 af
Outflow = 4.45 cfs @ 11.99 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min
Primary = 4.45 cfs @ 11.99 hrs, Volume= 0.170 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 5.81' @ 11.99 hrs Surf.Area= 0.001 ac Storage= 0.001 af

Plug-Flow detention time= 0.3 min calculated for 0.170 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (787.2 - 786.9)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	0.010 af	**6.00'D x 15.11'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	4.90'	**30.0" Round Culvert** L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 4.90' / 3.90' S= 0.0054 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=4.37 cfs @ 11.99 hrs HW=5.80' (Free Discharge)
1=Culvert (Barrel Controls 4.37 cfs @ 4.09 fps)

Summary for Pond 2P: Existing CB

Inflow Area = 0.161 ac, 51.13% Impervious, Inflow Depth = 3.47" for 10-yr event
Inflow = 0.94 cfs @ 11.97 hrs, Volume= 0.046 af
Outflow = 0.94 cfs @ 11.97 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.2 min
Primary = 0.94 cfs @ 11.97 hrs, Volume= 0.046 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 6.43' @ 11.97 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= 0.9 min calculated for 0.046 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (814.4 - 813.5)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.002 af	**6.00'D x 3.58'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.00'	**18.0" Round Culvert** L= 42.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.00' / 4.40' S= 0.0381 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=0.91 cfs @ 11.97 hrs HW=6.42' (Free Discharge)
1=Culvert (Inlet Controls 0.91 cfs @ 2.22 fps)

Summary for Pond P8: SW A Gallery inlet - PDMH 8

Inflow Area = 0.422 ac, 93.53% Impervious, Inflow Depth = 5.30" for 10-yr event
Inflow = 3.29 cfs @ 11.96 hrs, Volume= 0.186 af
Outflow = 3.28 cfs @ 11.96 hrs, Volume= 0.186 af, Atten= 0%, Lag= 0.1 min
Primary = 3.28 cfs @ 11.96 hrs, Volume= 0.186 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 17.43' @ 11.96 hrs Surf.Area= 13 sf Storage= 17 cf

Plug-Flow detention time= 0.3 min calculated for 0.186 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (749.6 - 749.3)

Volume	Invert	Avail.Storage	Storage Description
#1	16.10'	68 cf	**4.00'D x 5.40'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	16.10'	**12.0" Round Culvert** L= 5.0' Ke= 0.500 Inlet / Outlet Invert= 16.10' / 16.00' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=3.20 cfs @ 11.96 hrs HW=17.39' (Free Discharge)
1=Culvert (Barrel Controls 3.20 cfs @ 4.11 fps)

Summary for Pond P9: SW A outlet - PDMH 9

Inflow Area = 0.861 ac, 60.93% Impervious, Inflow Depth = 2.36" for 10-yr event
Inflow = 4.47 cfs @ 11.99 hrs, Volume= 0.170 af
Outflow = 4.46 cfs @ 11.99 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min
Primary = 4.46 cfs @ 11.99 hrs, Volume= 0.170 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 16.52' @ 11.99 hrs Surf.Area= 13 sf Storage= 15 cf
Flood Elev= 40.50' Surf.Area= 13 sf Storage= 73 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	15.30'	73 cf	**4.00'D x 5.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	15.30'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.30' / 15.00' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.38 cfs @ 11.99 hrs HW=16.50' (Free Discharge)
1=Culvert (Barrel Controls 4.38 cfs @ 4.62 fps)

Summary for Link PA1: Point Of Analysis

Inflow Area = 1.022 ac, 59.39% Impervious, Inflow Depth = 2.54" for 10-yr event
Inflow = 5.38 cfs @ 11.99 hrs, Volume= 0.216 af
Primary = 5.38 cfs @ 11.99 hrs, Volume= 0.216 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Subcatchment S1: Subcatchment 1

Runoff = 1.44 cfs @ 12.02 hrs, Volume= 0.080 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=5.65"

Area (sf)	CN	Adj	Description
5,657	98		Unconnected pavement, HSG B
13,466	61		>75% Grass cover, Good, HSG B
19,123	72	66	Weighted Average, UI Adjusted
13,466			70.42% Pervious Area
5,657			29.58% Impervious Area
5,657			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment S2: Subcatchment 2

Runoff = 0.94 cfs @ 11.97 hrs, Volume= 0.046 af, Depth= 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=5.65"

Area (sf)	CN	Description
3,581	98	Unconnected pavement, HSG B
3,423	61	>75% Grass cover, Good, HSG B
7,004	80	Weighted Average
3,423		48.87% Pervious Area
3,581		51.13% Impervious Area
3,581		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment S3: Subcatchment 3 (Roof)

Runoff = 3.29 cfs @ 11.96 hrs, Volume= 0.186 af, Depth= 5.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=5.65"

	Area (sf)	CN	Description
	14,579	98	Unconnected roofs, HSG B
*	2,621	98	Concrete Patio, HSG B
*	1,190	82	Patio, HSG B
	18,390	97	Weighted Average
	1,190		6.47% Pervious Area
	17,200		93.53% Impervious Area
	14,579		84.76% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond SGA: Stormwater Gallery A

Inflow Area = 0.422 ac, 93.53% Impervious, Inflow Depth = 5.30" for 10-yr event
Inflow = 3.28 cfs @ 11.96 hrs, Volume= 0.186 af
Outflow = 3.19 cfs @ 11.98 hrs, Volume= 0.186 af, Atten= 3%, Lag= 1.0 min
Discarded = 0.08 cfs @ 11.98 hrs, Volume= 0.097 af
Primary = 3.11 cfs @ 11.98 hrs, Volume= 0.090 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 17.68' @ 11.98 hrs Surf.Area= 520 sf Storage= 1,048 cf
Flood Elev= 8.50' Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 48.6 min calculated for 0.186 af (100% of inflow)
Center-of-Mass det. time= 48.4 min (798.0 - 749.6)

Volume	Invert	Avail.Storage	Storage Description
#1	14.75'	433 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 1,820 cf Overall - 736 cf Embedded = 1,084 cf x 40.0% Voids
#2	15.25'	736 cf	**30.0" Round Pipe Storage** x 3 Inside #1 L= 50.0'
		1,170 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.75	520	0	0
18.25	520	1,820	1,820

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.75'	**4.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.50'
#2	Primary	16.75'	**15.0" Round Culvert** L= 5.0' Ke= 0.500

Inlet / Outlet Invert= 16.75' / 16.50' S= 0.0500 '/' Cc= 0.900
n= 0.012, Flow Area= 1.23 sf

Discarded OutFlow Max=0.08 cfs @ 11.98 hrs HW=17.66' (Free Discharge)
↑**1=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=3.00 cfs @ 11.98 hrs HW=17.66' (Free Discharge)
↑**2=Culvert** (Barrel Controls 3.00 cfs @ 4.39 fps)

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	4.90	3.90	186.0	0.0054	0.013	30.0	0.0	0.0
2	2P	6.00	4.40	42.0	0.0381	0.011	18.0	0.0	0.0
3	P8	16.10	16.00	5.0	0.0200	0.012	12.0	0.0	0.0
4	P9	15.30	15.00	20.0	0.0150	0.012	15.0	0.0	0.0
5	SGA	16.75	16.50	5.0	0.0500	0.012	15.0	0.0	0.0

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Existing CB Peak Elev=5.56' Storage=0.000 af Inflow=2.47 cfs 0.077 af
30.0" Round Culvert n=0.013 L=186.0' S=0.0054 '/' Outflow=2.46 cfs 0.077 af

Pond 2P: Existing CB Peak Elev=6.31' Storage=0.000 af Inflow=0.50 cfs 0.024 af
18.0" Round Culvert n=0.011 L=42.0' S=0.0381 '/' Outflow=0.50 cfs 0.024 af

Pond P8: SW A Gallery inlet - PDMH 8 Peak Elev=17.03' Storage=12 cf Inflow=2.13 cfs 0.118 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0200 '/' Outflow=2.13 cfs 0.118 af

Pond P9: SW A outlet - PDMH 9 Peak Elev=16.12' Storage=10 cf Inflow=2.48 cfs 0.077 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0150 '/' Outflow=2.47 cfs 0.077 af

Link PA1: Point Of Analysis Inflow=2.96 cfs 0.101 af
Primary=2.96 cfs 0.101 af

Subcatchment S1: Subcatchment 1 Runoff Area=19,123 sf 29.58% Impervious Runoff Depth=0.91"
Tc=10.0 min UI Adjusted CN=66 Runoff=0.56 cfs 0.033 af

Subcatchment S2: Subcatchment 2 Runoff Area=7,004 sf 51.13% Impervious Runoff Depth=1.80"
Tc=6.0 min CN=80 Runoff=0.50 cfs 0.024 af

Subcatchment S3: Subcatchment 3 (Roof) Runoff Area=18,390 sf 93.53% Impervious Runoff Depth=3.35"
Tc=6.0 min CN=97 Runoff=2.13 cfs 0.118 af

Pond SGA: Stormwater Gallery A Peak Elev=17.44' Storage=970 cf Inflow=2.13 cfs 0.118 af
Discarded=0.08 cfs 0.075 af Primary=1.97 cfs 0.043 af Outflow=2.04 cfs 0.118 af

Total Runoff Area = 1.022 ac Runoff Volume = 0.175 af Average Runoff Depth = 2.06"
40.61% Pervious = 0.415 ac 59.39% Impervious = 0.607 ac

Summary for Pond 1P: Existing CB

Inflow Area = 0.861 ac, 60.93% Impervious, Inflow Depth = 1.07" for 2-yr event
Inflow = 2.47 cfs @ 11.99 hrs, Volume= 0.077 af
Outflow = 2.46 cfs @ 11.99 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min
Primary = 2.46 cfs @ 11.99 hrs, Volume= 0.077 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 5.56' @ 11.99 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= 0.3 min calculated for 0.077 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (794.2 - 793.9)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	0.010 af	**6.00'D x 15.11'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	4.90'	**30.0" Round Culvert** L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 4.90' / 3.90' S= 0.0054 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=2.41 cfs @ 11.99 hrs HW=5.56' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 2.41 cfs @ 3.50 fps)

Summary for Pond 2P: Existing CB

Inflow Area = 0.161 ac, 51.13% Impervious, Inflow Depth = 1.80" for 2-yr event
Inflow = 0.50 cfs @ 11.97 hrs, Volume= 0.024 af
Outflow = 0.50 cfs @ 11.98 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.2 min
Primary = 0.50 cfs @ 11.98 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 6.31' @ 11.98 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= 1.1 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (833.4 - 832.3)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.002 af	**6.00'D x 3.58'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.00'	**18.0" Round Culvert** L= 42.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.00' / 4.40' S= 0.0381 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=0.48 cfs @ 11.98 hrs HW=6.30' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.48 cfs @ 1.88 fps)

Summary for Pond P8: SW A Gallery inlet - PDMH 8

Inflow Area = 0.422 ac, 93.53% Impervious, Inflow Depth = 3.35" for 2-yr event
Inflow = 2.13 cfs @ 11.96 hrs, Volume= 0.118 af
Outflow = 2.13 cfs @ 11.96 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.1 min
Primary = 2.13 cfs @ 11.96 hrs, Volume= 0.118 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 17.03' @ 11.96 hrs Surf.Area= 13 sf Storage= 12 cf

Plug-Flow detention time= 0.3 min calculated for 0.118 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (759.0 - 758.7)

Volume	Invert	Avail.Storage	Storage Description
#1	16.10'	68 cf	**4.00'D x 5.40'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	16.10'	**12.0" Round Culvert** L= 5.0' Ke= 0.500 Inlet / Outlet Invert= 16.10' / 16.00' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.07 cfs @ 11.96 hrs HW=17.01' (Free Discharge)
1=Culvert (Barrel Controls 2.07 cfs @ 3.62 fps)

Summary for Pond P9: SW A outlet - PDMH 9

Inflow Area = 0.861 ac, 60.93% Impervious, Inflow Depth = 1.07" for 2-yr event
Inflow = 2.48 cfs @ 11.99 hrs, Volume= 0.077 af
Outflow = 2.47 cfs @ 11.99 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min
Primary = 2.47 cfs @ 11.99 hrs, Volume= 0.077 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 16.12' @ 11.99 hrs Surf.Area= 13 sf Storage= 10 cf
Flood Elev= 40.50' Surf.Area= 13 sf Storage= 73 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (793.9 - 793.8)

Volume	Invert	Avail.Storage	Storage Description
#1	15.30'	73 cf	**4.00'D x 5.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	15.30'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.30' / 15.00' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.43 cfs @ 11.99 hrs HW=16.11' (Free Discharge)
1=Culvert (Barrel Controls 2.43 cfs @ 4.12 fps)

Summary for Link PA1: Point Of Analysis

Inflow Area = 1.022 ac, 59.39% Impervious, Inflow Depth = 1.18" for 2-yr event
Inflow = 2.96 cfs @ 11.99 hrs, Volume= 0.101 af
Primary = 2.96 cfs @ 11.99 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Subcatchment S1: Subcatchment 1

Runoff = 0.56 cfs @ 12.03 hrs, Volume= 0.033 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.70"

Area (sf)	CN	Adj	Description
5,657	98		Unconnected pavement, HSG B
13,466	61		>75% Grass cover, Good, HSG B
19,123	72	66	Weighted Average, UI Adjusted
13,466			70.42% Pervious Area
5,657			29.58% Impervious Area
5,657			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment S2: Subcatchment 2

Runoff = 0.50 cfs @ 11.97 hrs, Volume= 0.024 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.70"

Area (sf)	CN	Description
3,581	98	Unconnected pavement, HSG B
3,423	61	>75% Grass cover, Good, HSG B
7,004	80	Weighted Average
3,423		48.87% Pervious Area
3,581		51.13% Impervious Area
3,581		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment S3: Subcatchment 3 (Roof)

Runoff = 2.13 cfs @ 11.96 hrs, Volume= 0.118 af, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.70"

	Area (sf)	CN	Description
	14,579	98	Unconnected roofs, HSG B
*	2,621	98	Concrete Patio, HSG B
*	1,190	82	Patio, HSG B
	18,390	97	Weighted Average
	1,190		6.47% Pervious Area
	17,200		93.53% Impervious Area
	14,579		84.76% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond SGA: Stormwater Gallery A

Inflow Area = 0.422 ac, 93.53% Impervious, Inflow Depth = 3.35" for 2-yr event
Inflow = 2.13 cfs @ 11.96 hrs, Volume= 0.118 af
Outflow = 2.04 cfs @ 11.98 hrs, Volume= 0.118 af, Atten= 4%, Lag= 1.3 min
Discarded = 0.08 cfs @ 11.98 hrs, Volume= 0.075 af
Primary = 1.97 cfs @ 11.98 hrs, Volume= 0.043 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 17.44' @ 11.98 hrs Surf.Area= 520 sf Storage= 970 cf
Flood Elev= 8.50' Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 51.8 min calculated for 0.118 af (100% of inflow)
Center-of-Mass det. time= 51.7 min (810.7 - 759.0)

Volume	Invert	Avail.Storage	Storage Description
#1	14.75'	433 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 1,820 cf Overall - 736 cf Embedded = 1,084 cf x 40.0% Voids
#2	15.25'	736 cf	**30.0" Round Pipe Storage** x 3 Inside #1 L= 50.0'
		1,170 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.75	520	0	0
18.25	520	1,820	1,820

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.75'	**4.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.50'
#2	Primary	16.75'	**15.0" Round Culvert** L= 5.0' Ke= 0.500

Inlet / Outlet Invert= 16.75' / 16.50' S= 0.0500 '/' Cc= 0.900
n= 0.012, Flow Area= 1.23 sf

Discarded OutFlow Max=0.08 cfs @ 11.98 hrs HW=17.43' (Free Discharge)
↑**1=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=1.91 cfs @ 11.98 hrs HW=17.43' (Free Discharge)
↑**2=Culvert** (Inlet Controls 1.91 cfs @ 2.80 fps)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Existing CB Peak Elev=5.98' Storage=0.001 af Inflow=6.10 cfs 0.252 af
30.0" Round Culvert n=0.013 L=186.0' S=0.0054 '/' Outflow=6.10 cfs 0.252 af

Pond 2P: Existing CB Peak Elev=6.51' Storage=0.000 af Inflow=1.31 cfs 0.065 af
18.0" Round Culvert n=0.011 L=42.0' S=0.0381 '/' Outflow=1.30 cfs 0.065 af

Pond P8: SW A Gallery inlet - PDMH 8 Peak Elev=17.82' Storage=22 cf Inflow=4.20 cfs 0.240 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0200 '/' Outflow=4.19 cfs 0.240 af

Pond P9: SW A outlet - PDMH 9 Peak Elev=16.99' Storage=21 cf Inflow=6.12 cfs 0.253 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0150 '/' Outflow=6.10 cfs 0.252 af

Link PA1: Point Of Analysis Inflow=7.39 cfs 0.318 af
Primary=7.39 cfs 0.318 af

Subcatchment S1: Subcatchment 1 Runoff Area=19,123 sf 29.58% Impervious Runoff Depth=3.35"
Tc=10.0 min UI Adjusted CN=66 Runoff=2.23 cfs 0.123 af

Subcatchment S2: Subcatchment 2 Runoff Area=7,004 sf 51.13% Impervious Runoff Depth=4.87"
Tc=6.0 min CN=80 Runoff=1.31 cfs 0.065 af

Subcatchment S3: Subcatchment 3 (Roof) Runoff Area=18,390 sf 93.53% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=97 Runoff=4.20 cfs 0.240 af

Pond SGA: Stormwater Gallery A Peak Elev=17.86' Storage=1,089 cf Inflow=4.19 cfs 0.240 af
Discarded=0.08 cfs 0.110 af Primary=4.02 cfs 0.130 af Outflow=4.10 cfs 0.240 af

Total Runoff Area = 1.022 ac Runoff Volume = 0.428 af Average Runoff Depth = 5.03"
40.61% Pervious = 0.415 ac 59.39% Impervious = 0.607 ac

Summary for Pond 1P: Existing CB

Inflow Area = 0.861 ac, 60.93% Impervious, Inflow Depth = 3.52" for 25-yr event
Inflow = 6.10 cfs @ 11.99 hrs, Volume= 0.252 af
Outflow = 6.10 cfs @ 11.99 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.0 min
Primary = 6.10 cfs @ 11.99 hrs, Volume= 0.252 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 5.98' @ 11.99 hrs Surf.Area= 0.001 ac Storage= 0.001 af

Plug-Flow detention time= 0.2 min calculated for 0.252 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (784.0 - 783.8)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	0.010 af	**6.00'D x 15.11'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	4.90'	**30.0" Round Culvert** L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 4.90' / 3.90' S= 0.0054 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=5.96 cfs @ 11.99 hrs HW=5.96' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 5.96 cfs @ 4.42 fps)

Summary for Pond 2P: Existing CB

Inflow Area = 0.161 ac, 51.13% Impervious, Inflow Depth = 4.87" for 25-yr event
Inflow = 1.31 cfs @ 11.97 hrs, Volume= 0.065 af
Outflow = 1.30 cfs @ 11.97 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.2 min
Primary = 1.30 cfs @ 11.97 hrs, Volume= 0.065 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 6.51' @ 11.97 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= 0.7 min calculated for 0.065 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (804.6 - 803.9)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.002 af	**6.00'D x 3.58'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.00'	**18.0" Round Culvert** L= 42.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.00' / 4.40' S= 0.0381 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=1.26 cfs @ 11.97 hrs HW=6.50' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.26 cfs @ 2.42 fps)

Summary for Pond P8: SW A Gallery inlet - PDMH 8

Inflow Area = 0.422 ac, 93.53% Impervious, Inflow Depth = 6.83" for 25-yr event
Inflow = 4.20 cfs @ 11.96 hrs, Volume= 0.240 af
Outflow = 4.19 cfs @ 11.96 hrs, Volume= 0.240 af, Atten= 0%, Lag= 0.1 min
Primary = 4.19 cfs @ 11.96 hrs, Volume= 0.240 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 17.82' @ 11.96 hrs Surf.Area= 13 sf Storage= 22 cf

Plug-Flow detention time= 0.2 min calculated for 0.240 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (745.1 - 744.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.10'	68 cf	**4.00'D x 5.40'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	16.10'	**12.0" Round Culvert** L= 5.0' Ke= 0.500 Inlet / Outlet Invert= 16.10' / 16.00' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=4.09 cfs @ 11.96 hrs HW=17.77' (Free Discharge)
1=Culvert (Inlet Controls 4.09 cfs @ 5.20 fps)

Summary for Pond P9: SW A outlet - PDMH 9

Inflow Area = 0.861 ac, 60.93% Impervious, Inflow Depth = 3.52" for 25-yr event
Inflow = 6.12 cfs @ 11.99 hrs, Volume= 0.253 af
Outflow = 6.10 cfs @ 11.99 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.0 min
Primary = 6.10 cfs @ 11.99 hrs, Volume= 0.252 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 16.99' @ 11.99 hrs Surf.Area= 13 sf Storage= 21 cf
Flood Elev= 40.50' Surf.Area= 13 sf Storage= 73 cf

Plug-Flow detention time= 1.0 min calculated for 0.252 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (783.8 - 783.6)

Volume	Invert	Avail.Storage	Storage Description
#1	15.30'	73 cf	**4.00'D x 5.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	15.30'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.30' / 15.00' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=5.98 cfs @ 11.99 hrs HW=16.95' (Free Discharge)
1=Culvert (Inlet Controls 5.98 cfs @ 4.87 fps)

Summary for Link PA1: Point Of Analysis

Inflow Area = 1.022 ac, 59.39% Impervious, Inflow Depth = 3.73" for 25-yr event
Inflow = 7.39 cfs @ 11.99 hrs, Volume= 0.318 af
Primary = 7.39 cfs @ 11.99 hrs, Volume= 0.318 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Subcatchment S1: Subcatchment 1

Runoff = 2.23 cfs @ 12.02 hrs, Volume= 0.123 af, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=7.19"

Area (sf)	CN	Adj	Description
5,657	98		Unconnected pavement, HSG B
13,466	61		>75% Grass cover, Good, HSG B
19,123	72	66	Weighted Average, UI Adjusted
13,466			70.42% Pervious Area
5,657			29.58% Impervious Area
5,657			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment S2: Subcatchment 2

Runoff = 1.31 cfs @ 11.97 hrs, Volume= 0.065 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=7.19"

Area (sf)	CN	Description
3,581	98	Unconnected pavement, HSG B
3,423	61	>75% Grass cover, Good, HSG B
7,004	80	Weighted Average
3,423		48.87% Pervious Area
3,581		51.13% Impervious Area
3,581		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment S3: Subcatchment 3 (Roof)

Runoff = 4.20 cfs @ 11.96 hrs, Volume= 0.240 af, Depth= 6.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=7.19"

	Area (sf)	CN	Description
	14,579	98	Unconnected roofs, HSG B
*	2,621	98	Concrete Patio, HSG B
*	1,190	82	Patio, HSG B
	18,390	97	Weighted Average
	1,190		6.47% Pervious Area
	17,200		93.53% Impervious Area
	14,579		84.76% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond SGA: Stormwater Gallery A

Inflow Area = 0.422 ac, 93.53% Impervious, Inflow Depth = 6.83" for 25-yr event
Inflow = 4.19 cfs @ 11.96 hrs, Volume= 0.240 af
Outflow = 4.10 cfs @ 11.98 hrs, Volume= 0.240 af, Atten= 2%, Lag= 0.7 min
Discarded = 0.08 cfs @ 11.98 hrs, Volume= 0.110 af
Primary = 4.02 cfs @ 11.98 hrs, Volume= 0.130 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 17.86' @ 11.98 hrs Surf.Area= 520 sf Storage= 1,089 cf
Flood Elev= 8.50' Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 47.5 min calculated for 0.240 af (100% of inflow)
Center-of-Mass det. time= 47.7 min (792.7 - 745.1)

Volume	Invert	Avail.Storage	Storage Description
#1	14.75'	433 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 1,820 cf Overall - 736 cf Embedded = 1,084 cf x 40.0% Voids
#2	15.25'	736 cf	**30.0" Round Pipe Storage** x 3 Inside #1 L= 50.0'
		1,170 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.75	520	0	0
18.25	520	1,820	1,820

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.75'	**4.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.50'
#2	Primary	16.75'	**15.0" Round Culvert** L= 5.0' Ke= 0.500

Inlet / Outlet Invert= 16.75' / 16.50' S= 0.0500 '/' Cc= 0.900
n= 0.012, Flow Area= 1.23 sf

Discarded OutFlow Max=0.08 cfs @ 11.98 hrs HW=17.83' (Free Discharge)
↑**1=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=3.89 cfs @ 11.98 hrs HW=17.83' (Free Discharge)
↑**2=Culvert** (Barrel Controls 3.89 cfs @ 4.60 fps)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Existing CB Peak Elev=6.13' Storage=0.001 af Inflow=7.70 cfs 0.335 af
30.0" Round Culvert n=0.013 L=186.0' S=0.0054 '/' Outflow=7.70 cfs 0.335 af

Pond 2P: Existing CB Peak Elev=6.58' Storage=0.000 af Inflow=1.65 cfs 0.083 af
18.0" Round Culvert n=0.011 L=42.0' S=0.0381 '/' Outflow=1.64 cfs 0.083 af

Pond P8: SW A Gallery inlet - PDMH 8 Peak Elev=18.36' Storage=28 cf Inflow=5.05 cfs 0.291 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0200 '/' Outflow=5.02 cfs 0.291 af

Pond P9: SW A outlet - PDMH 9 Peak Elev=17.62' Storage=29 cf Inflow=7.74 cfs 0.336 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0150 '/' Outflow=7.70 cfs 0.335 af

Link PA1: Point Of Analysis Inflow=9.32 cfs 0.419 af
Primary=9.32 cfs 0.419 af

Subcatchment S1: Subcatchment 1 Runoff Area=19,123 sf 29.58% Impervious Runoff Depth=4.53"
Tc=10.0 min UI Adjusted CN=66 Runoff=3.01 cfs 0.166 af

Subcatchment S2: Subcatchment 2 Runoff Area=7,004 sf 51.13% Impervious Runoff Depth=6.22"
Tc=6.0 min CN=80 Runoff=1.65 cfs 0.083 af

Subcatchment S3: Subcatchment 3 (Roof) Runoff Area=18,390 sf 93.53% Impervious Runoff Depth=8.27"
Tc=6.0 min CN=97 Runoff=5.05 cfs 0.291 af

Pond SGA: Stormwater Gallery A Peak Elev=18.04' Storage=1,127 cf Inflow=5.02 cfs 0.291 af
Discarded=0.08 cfs 0.121 af Primary=4.87 cfs 0.170 af Outflow=4.95 cfs 0.291 af

Total Runoff Area = 1.022 ac Runoff Volume = 0.540 af Average Runoff Depth = 6.34"
40.61% Pervious = 0.415 ac 59.39% Impervious = 0.607 ac

Summary for Pond 1P: Existing CB

Inflow Area = 0.861 ac, 60.93% Impervious, Inflow Depth = 4.67" for 50-yr event
Inflow = 7.70 cfs @ 11.99 hrs, Volume= 0.335 af
Outflow = 7.70 cfs @ 11.99 hrs, Volume= 0.335 af, Atten= 0%, Lag= 0.0 min
Primary = 7.70 cfs @ 11.99 hrs, Volume= 0.335 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 6.13' @ 11.99 hrs Surf.Area= 0.001 ac Storage= 0.001 af

Plug-Flow detention time= 0.2 min calculated for 0.335 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (781.4 - 781.2)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	0.010 af	**6.00'D x 15.11'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	4.90'	**30.0" Round Culvert** L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 4.90' / 3.90' S= 0.0054 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=7.53 cfs @ 11.99 hrs HW=6.11' (Free Discharge)
↑**1=Culvert** (Barrel Controls 7.53 cfs @ 4.68 fps)

Summary for Pond 2P: Existing CB

Inflow Area = 0.161 ac, 51.13% Impervious, Inflow Depth = 6.22" for 50-yr event
Inflow = 1.65 cfs @ 11.97 hrs, Volume= 0.083 af
Outflow = 1.64 cfs @ 11.97 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.1 min
Primary = 1.64 cfs @ 11.97 hrs, Volume= 0.083 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 6.58' @ 11.97 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= 0.7 min calculated for 0.083 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (797.6 - 797.0)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.002 af	**6.00'D x 3.58'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.00'	**18.0" Round Culvert** L= 42.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.00' / 4.40' S= 0.0381 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=1.59 cfs @ 11.97 hrs HW=6.57' (Free Discharge)
↑**1=Culvert** (Inlet Controls 1.59 cfs @ 2.58 fps)

Summary for Pond P8: SW A Gallery inlet - PDMH 8

Inflow Area = 0.422 ac, 93.53% Impervious, Inflow Depth = 8.27" for 50-yr event
Inflow = 5.05 cfs @ 11.96 hrs, Volume= 0.291 af
Outflow = 5.02 cfs @ 11.97 hrs, Volume= 0.291 af, Atten= 1%, Lag= 0.2 min
Primary = 5.02 cfs @ 11.97 hrs, Volume= 0.291 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 18.36' @ 11.96 hrs Surf.Area= 13 sf Storage= 28 cf

Plug-Flow detention time= 0.2 min calculated for 0.290 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (742.0 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.10'	68 cf	**4.00'D x 5.40'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	16.10'	**12.0" Round Culvert** L= 5.0' Ke= 0.500 Inlet / Outlet Invert= 16.10' / 16.00' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=4.90 cfs @ 11.97 hrs HW=18.28' (Free Discharge)
1=Culvert (Inlet Controls 4.90 cfs @ 6.23 fps)

Summary for Pond P9: SW A outlet - PDMH 9

Inflow Area = 0.861 ac, 60.93% Impervious, Inflow Depth = 4.68" for 50-yr event
Inflow = 7.74 cfs @ 11.99 hrs, Volume= 0.336 af
Outflow = 7.70 cfs @ 11.99 hrs, Volume= 0.335 af, Atten= 0%, Lag= 0.0 min
Primary = 7.70 cfs @ 11.99 hrs, Volume= 0.335 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 17.62' @ 11.99 hrs Surf.Area= 13 sf Storage= 29 cf
Flood Elev= 40.50' Surf.Area= 13 sf Storage= 73 cf

Plug-Flow detention time= 1.3 min calculated for 0.335 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (781.2 - 781.0)

Volume	Invert	Avail.Storage	Storage Description
#1	15.30'	73 cf	**4.00'D x 5.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	15.30'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.30' / 15.00' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=7.53 cfs @ 11.99 hrs HW=17.55' (Free Discharge)
1=Culvert (Inlet Controls 7.53 cfs @ 6.14 fps)

Summary for Link PA1: Point Of Analysis

Inflow Area = 1.022 ac, 59.39% Impervious, Inflow Depth = 4.92" for 50-yr event
Inflow = 9.32 cfs @ 11.99 hrs, Volume= 0.419 af
Primary = 9.32 cfs @ 11.99 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Subcatchment S1: Subcatchment 1

Runoff = 3.01 cfs @ 12.02 hrs, Volume= 0.166 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=8.63"

Area (sf)	CN	Adj	Description
5,657	98		Unconnected pavement, HSG B
13,466	61		>75% Grass cover, Good, HSG B
19,123	72	66	Weighted Average, UI Adjusted
13,466			70.42% Pervious Area
5,657			29.58% Impervious Area
5,657			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment S2: Subcatchment 2

Runoff = 1.65 cfs @ 11.97 hrs, Volume= 0.083 af, Depth= 6.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=8.63"

Area (sf)	CN	Description
3,581	98	Unconnected pavement, HSG B
3,423	61	>75% Grass cover, Good, HSG B
7,004	80	Weighted Average
3,423		48.87% Pervious Area
3,581		51.13% Impervious Area
3,581		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment S3: Subcatchment 3 (Roof)

Runoff = 5.05 cfs @ 11.96 hrs, Volume= 0.291 af, Depth= 8.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=8.63"

	Area (sf)	CN	Description
	14,579	98	Unconnected roofs, HSG B
*	2,621	98	Concrete Patio, HSG B
*	1,190	82	Patio, HSG B
	18,390	97	Weighted Average
	1,190		6.47% Pervious Area
	17,200		93.53% Impervious Area
	14,579		84.76% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond SGA: Stormwater Gallery A

Inflow Area = 0.422 ac, 93.53% Impervious, Inflow Depth = 8.27" for 50-yr event
Inflow = 5.02 cfs @ 11.97 hrs, Volume= 0.291 af
Outflow = 4.95 cfs @ 11.98 hrs, Volume= 0.291 af, Atten= 1%, Lag= 0.7 min
Discarded = 0.08 cfs @ 11.98 hrs, Volume= 0.121 af
Primary = 4.87 cfs @ 11.98 hrs, Volume= 0.170 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 18.04' @ 11.98 hrs Surf.Area= 520 sf Storage= 1,127 cf
Flood Elev= 8.50' Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 47.2 min calculated for 0.291 af (100% of inflow)
Center-of-Mass det. time= 47.1 min (789.1 - 742.0)

Volume	Invert	Avail.Storage	Storage Description
#1	14.75'	433 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 1,820 cf Overall - 736 cf Embedded = 1,084 cf x 40.0% Voids
#2	15.25'	736 cf	**30.0" Round Pipe Storage** x 3 Inside #1 L= 50.0'
		1,170 cf	Total Available Storage

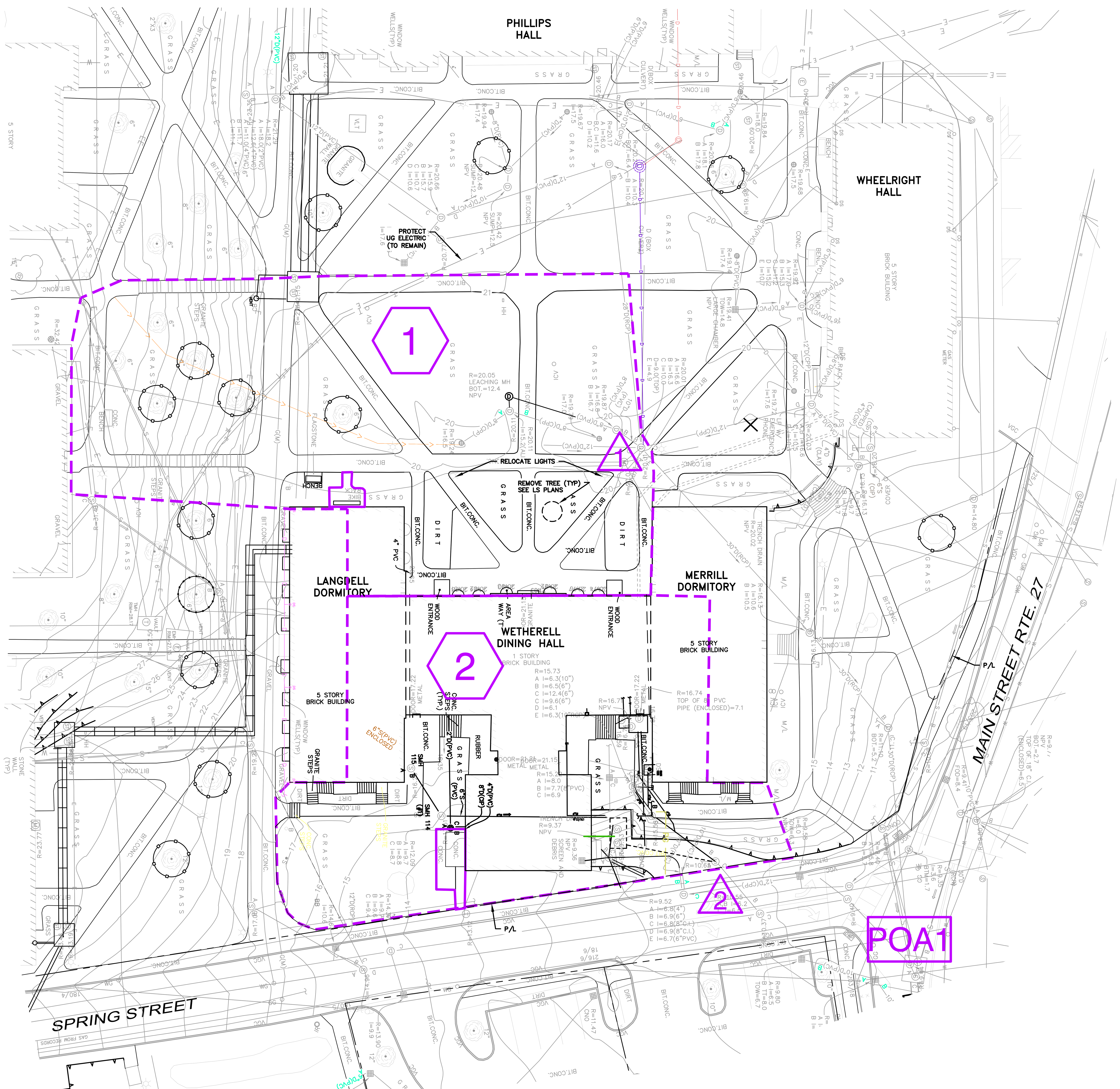
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.75	520	0	0
18.25	520	1,820	1,820

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.75'	**4.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.50'
#2	Primary	16.75'	**15.0" Round Culvert** L= 5.0' Ke= 0.500

Inlet / Outlet Invert= 16.75' / 16.50' S= 0.0500 '/' Cc= 0.900
n= 0.012, Flow Area= 1.23 sf

Discarded OutFlow Max=0.08 cfs @ 11.98 hrs HW=18.00' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=4.68 cfs @ 11.98 hrs HW=18.00' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 4.68 cfs @ 3.81 fps)



NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM NAD 83

LEGEND

- PROPERTY LINE
- WETLAND/SOILS BOUNDARY
- 60 EXISTING CONTOUR
- EXISTING PAVEMENT/CURB
- EXISTING TREELINE
- WATERSHED BOUNDARY
- Tc PATH
- SURFACE FLOW DIRECTION
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)

P5146

CASE #22-12

TOWN OF EXETER PROJECT REFERENCE

ENGINEER:

ALTUS ENGINEERING, INC.

133 Court Street, Portsmouth, NH 03801
(603) 433-2335, www.altus-eng.com

ARCHITECT:

RAMSA

ROBERT A.M. STERN ARCHITECTS, LLP
ONE PARK AVENUE
NEW YORK, NY 10016

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:

DRAINAGE REPORT

ISSUE DATE:

JULY 8, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMITTAL	CDB	07/08/22

DRAWN BY: CDB

APPROVED BY:

DRAWING FILE: 5146SITE.DWG

SCALE:

(24"x36") 1"=20'

OWNER/APPLICANT:

SIGILL PHILLIP EXONIENSIS ACADEMIAE · FINIS ORIGINE PENDET · NOV HAM 1781

Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:

PHILLIPS EXETER ACADEMY

WETHERELL, MERRILL & LANGDELL, REPLACEMENT AND RENOVATION PROJECT

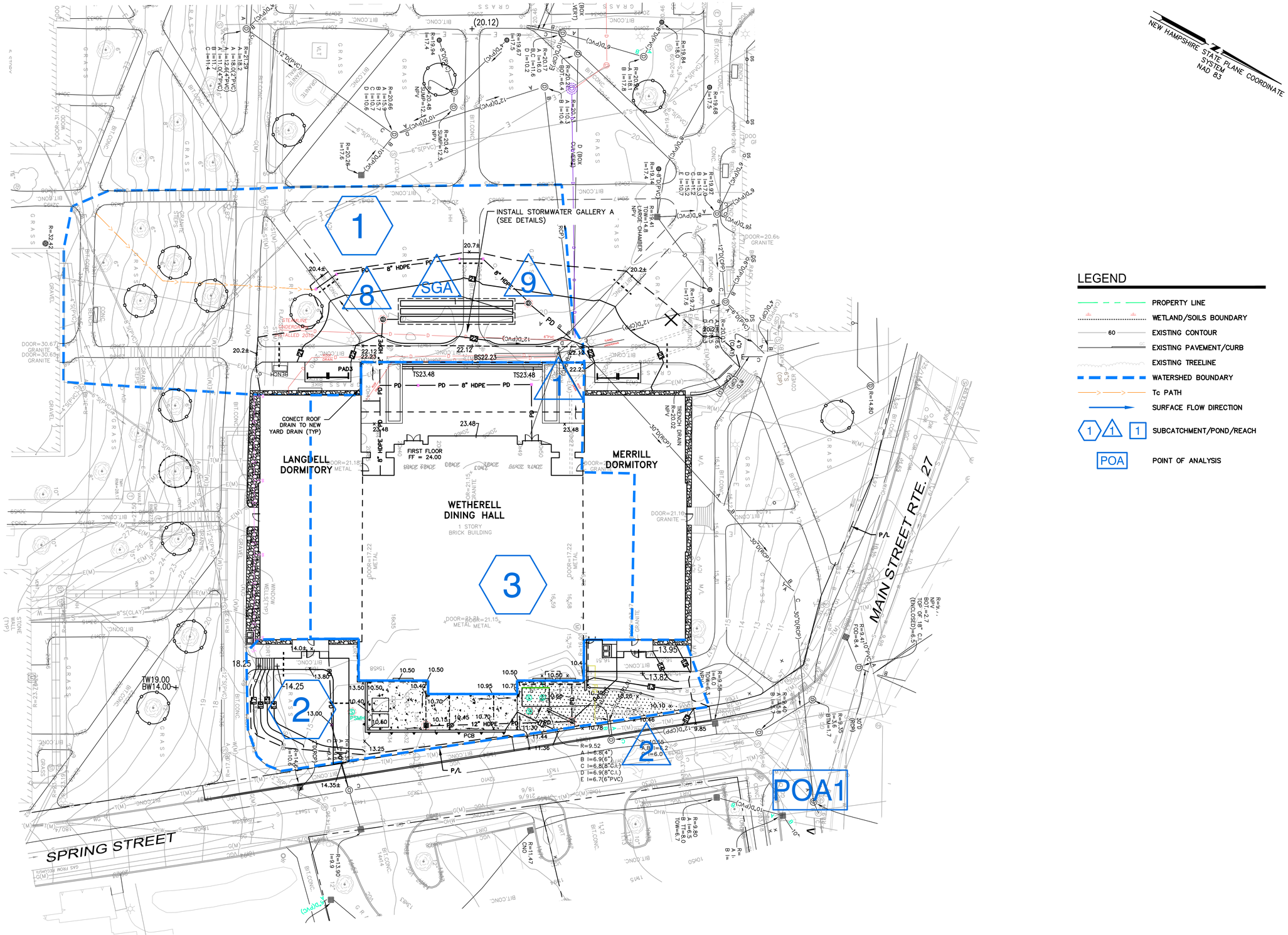
EXETER, NH 03833

TITLE:

PRE-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:

W1.0



LEGEND

- PROPERTY LINE
- WETLAND/SOILS BOUNDARY
- 60 EXISTING CONTOUR
- EXISTING PAVEMENT/CURB
- EXISTING TREELINE
- WATERSHED BOUNDARY
- Tc PATH
- SURFACE FLOW DIRECTION
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)

P5146

CASE #22-12

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(603) 433-2335

Portsmouth, NH 03801
www.altus-eng.com

SURVEYOR:

RAMSA

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REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMITTAL	CDB	07/08/22

DRAWN BY: CDB

APPROVED BY:

DRAWING FILE: 5146SITE.DWG

SCALE: (24"x36") 1"=20'

OWNER/APPLICANT:

Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:

PHILLIPS EXETER ACADEMY

WETHERELL, MERRILL & LANGDELL, REPLACEMENT AND RENOVATION PROJECT

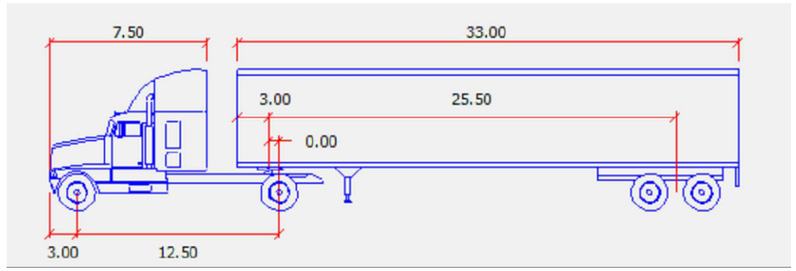
EXETER, NH 03833

TITLE:

POST-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:

W2.0



LARGE DELIVERY TRUCK
(WB–40)

NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM
NAD 83

DUMPSTER (10 YARD)
W/(2) BOLLARDS, 2
TOTAL

TRUCK LOADING AREA

P/L

APPROX PROPERTY LINE

PEA PARKING LOT

MUSEUM PARKING LOT

GRAPHIC SCALE

20 0 10 20 40

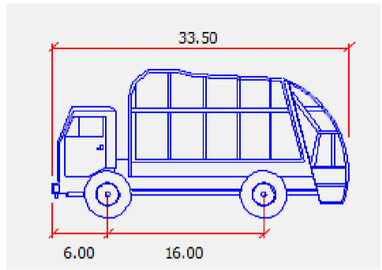
(IN FEET)

LARGE DELIVERY TRUCK TURNING TEMPLATE

PHILLIPS EXETER ACADEMY
WETHERELL, LANGDELL, MERRILL RENOVATION AND REPLACEMENT
EXETER, NEW HAMPSHIRE

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

SCALE: 1" = 20' (11" X 17")
SHEET: 1 OF 1
DATE: 08/24/2022
FILE: 5146_SITE.dwg
PROJECT NO. 5146



GARBAGE TRUCK
33.5 ft FRONT LOADER
(TERRA PRO)

NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM
NAD 83

DUMPSTER (10 YARD)
W/(2) BOLLARDS, 2
TOTAL

CONSTRUCT CONCRETE PAVING
(TRUCK LOADING AREA)

P/L

PEA PARKING LOT

MUSEUM PARKING LOT

APPROX PROPERTY
LINE

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)

DUMPSTER TRUCK TURNING TEMPLATE

PHILLIPS EXETER ACADEMY
WETHERELL, LANGDELL, MERRILL RENOVATION AND REPLACEMENT
EXETER, NEW HAMPSHIRE

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
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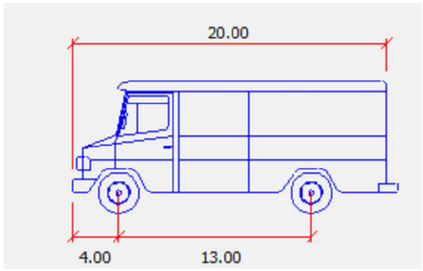
SCALE: 1" = 20' (11" X 17")
SHEET: 1 OF 1
DATE: 07/05/2022
FILE: 5146_SITE.dwg
PROJECT NO. 5146



DELIVERY VAN
(20 FT)

NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM
NAD 83

DUMPSTER (10 YARD)
W/ BOLLARDS, TYP

TRUCK LOADING AREA

PEA PARKING LOT

MUSEUM PARKING LOT

APPROX PROPERTY LINE

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)

DELIVERY VAN TURNING TEMPLATE

PHILLIPS EXETER ACADEMY
WETHERELL, LANGDELL, MERRILL RENOVATION AND REPLACEMENT
EXETER, NEW HAMPSHIRE

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

SCALE: 1" = 20' (11" X 17")
SHEET: 1 OF 1
DATE: 07/05/2022
FILE: 5146_SITE.dwg
PROJECT NO. 5146

CASE #22-12

APPROVED FOR THE RECORD:

EXETER PLANNING BOARD _____ DATE _____

PHILLIPS EXETER ACADEMY

WETHERELL, LANGDELL, AND MERRILL REPLACEMENT AND RENOVATION PROJECT

20-24 SPRING STREET
EXETER, NEW HAMPSHIRE
TAX MAP 72, LOT 208

Owner:

Phillips Exeter Academy
20 Main Street
Exeter, New Hampshire 03833

Architect:

ROBERT A.M. STERN ARCHITECTS, LLP.

ONE PARK AVENUE, NEW YORK, NEW YORK 10016
TEL (212) 967-5100 | FAX (212) 967-5588

Civil Engineer:

ALTUS ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

Landscape Architect:

kzla

36 Bromfield Street Suite 202
Boston, MA 02108
617 451-1018 Tel
www.kylezick.com

Surveyor:

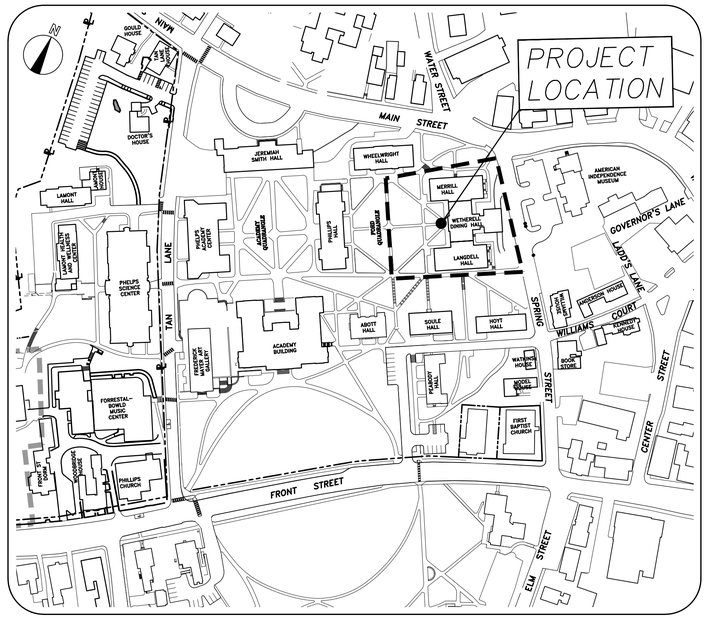
Nitsch Engineering

www.nitscheng.com
2 Center Plaza, Suite 430
Boston, MA 02108

APPLICATION FOR SITE PLAN REVIEW

Plan Issue Dates:

AUGUST 29, 2022 PLANNING BOARD



LOCUS MAP
1" = 150'

Sheet Index Title	*Sheet No.:*	*Rev.*	*Date*
Existing Conditions Survey (Nitsch)	EX–1	2	08/26/22
Area Plan	C1.0	1	08/29/22
Site Preparation Plan	C2.0	1	08/29/22
Site Plan	C3.0	1	08/29/22
Utilities Plan	C4.0	1	08/29/22
Grading, Drainage and Erosion Control Plan	C5.0	1	08/29/22
Erosion Control Notes and Details	C6.0	1	08/29/22
Details	C6.1–6.5	1	08/29/22
Landscape Plan (KZLA)	L1.01	4	03/09/22
Landscape Details (KZLA)	L2.01–2.03	4	03/09/22
Floor Plans (RAMSA)	A101–A105	2	03/11/22
Building Elevations (RAMSA)	A201–A202	2	03/11/22
Street View – Renderings (RAMSA)	A900	2	03/11/22

NOTES:

CONSTRUCTION SHALL NOT COMMENCE UNTIL ALL REGULATORY APPROVALS HAVE BEEN RECEIVED. DRAWINGS ISSUED AUGUST 29, 2022 ARE SUBJECT TO CHANGE BASED REGULATORY REVIEW AND APPROVALS. DRAWINGS WILL BE REVISED AND REISSUED AS NECESSARY TO ADDRESS REGULATORY COMMENTS AND CONDITIONS OF APPROVALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTING THE PROJECT IN ACCORDANCE WITH ALL CONDITIONS OF THE APPROVALS.

P5146

UTILITY INFORMATION STATEMENT

1. THE SUB–SURFACE UTILITY INFORMATION SHOWN HEREON IS COMPILED BASED ON FIELD SURVEY INFORMATION, RECORD INFORMATION AS SUPPLIED BY THE APPROPRIATE UTILITY COMPANIES, AND PLAN INFORMATION SUPPLIED BY THE CLIENT, IF ANY; THEREFORE WE CANNOT GUARANTEE THE ACCURACY OF SAID COMPILED SUB–SURFACE INFORMATION TO ANY CERTAIN DEGREE OF STATED TOLERANCE. ONLY PHYSICALLY LOCATED SUB–SURFACE UTILITY FEATURES FALL WITHIN NORMAL STANDARD OF CARE ACCURACIES.

2. THE LOCATIONS OF UNDERGROUND PIPES, CONDUITS, AND STRUCTURES HAVE BEEN DETERMINED FROM SAID INFORMATION, AND ARE APPROXIMATE ONLY. COMPILED LOCATIONS OF ANY UNDERGROUND STRUCTURES, NOT VISIBLY OBSERVED AND LOCATED, CAN VARY FROM THEIR ACTUAL LOCATIONS.

3. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED.

4. THE STATUS OF UTILITIES, WHETHER ACTIVE, ABANDONED, OR REMOVED, IS AN UNKNOWN CONDITION AS FAR AS OUR COMPILATION OF THIS INFORMATION.

5. IT IS INCUMBENT UPON INDIVIDUALS USING THIS INFORMATION TO UNDERSTAND THAT COMPILING UTILITY INFORMATION IS NOT EXACT, AND IS SUBJECT TO CHANGE BASED UPON VARYING PLAN INFORMATION RECEIVED AND ACTUAL LOCATIONS.

6. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES IS SUBJECT TO FIELD CONDITIONS, THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS AND OTHER MATTERS.

7. THE PROPER UTILITY ENGINEERING/COMPANY SHOULD BE CONSULTED AND THE ACTUAL LOCATIONS OF SUBSURFACE STRUCTURES SHOULD BE VERIFIED IN THE FIELD (V.I.F.) BEFORE PLANNING FUTURE CONNECTIONS. CONTACT THE DIG SAFE CALL CENTER AT 1–888–344–7233, SEVENTY–TWO HOURS PRIOR TO EXCAVATION, BLASTING, GRADING, AND/OR PAVING.

8. AS OF THE DATE OF THIS PLAN RECORD INFORMATION HAS NOT BEEN RECEIVED BY NITSCH ENGINEERING FOR THE FOLLOWING UTILITIES:

NOTES

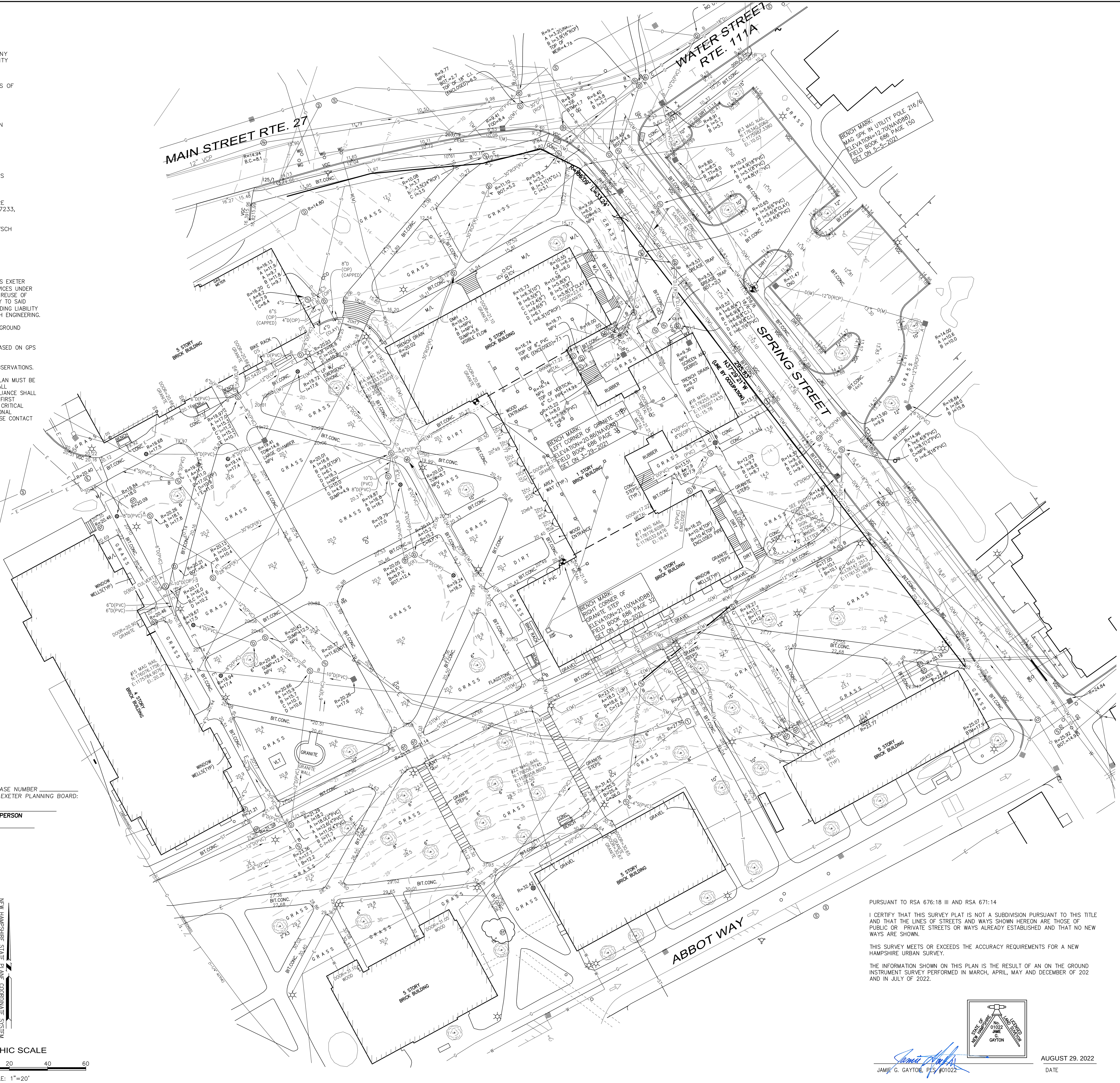
1. THIS DOCUMENT IS AN INSTRUMENT OF SERVICE OF NITSCH ENGINEERING. IT IS ISSUED TO PHILLIPS EXETER ACADEMY FOR PURPOSES RELATED DIRECTLY AND SOLELY TO NITSCH ENGINEERING'S SCOPE OF SERVICES UNDER CONTRACT WITH PHILLIPS EXETER ACADEMY FOR EXISTING CONDITIONS OF FORD QUAD. ANY USE OR REUSE OF THIS DOCUMENT FOR ANY REASON BY ANY PARTY FOR PURPOSES UNRELATED DIRECTLY AND SOLELY TO SAID CONTRACT AND PROJECT SHALL BE AT THE USER'S SOLE AND EXCLUSIVE RISK AND LIABILITY, INCLUDING LIABILITY FOR VIOLATION OF COPYRIGHT LAWS, UNLESS WRITTEN AUTHORIZATION IS GIVEN THEREFOR BY NITSCH ENGINEERING.

2. THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING CONDITIONS AS THE RESULT OF AN ON–THE–GROUND INSTRUMENT SURVEY WHICH OCCURRED MARCH, APRIL, MAY 2021.

3. HORIZONTAL BEARINGS REFER TO NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM (NAD83) BASED ON GPS OBSERVASTIONS.

4. ELEVATION REFERS TO NORTH AMERICAN VERTICAL DATUM (NAVD88) VERTICAL BASED ON GPS OBSERVATIONS.

5. THE INFORMATION CONTAINED ON THE DISK OR ELECTRONIC DRAWING FILE ACCOMPANYING THIS PLAN MUST BE COMPARED TO THE SEALED AND SIGNED HARD COPY OF THE PLAN TO ENSURE THE ACCURACY OF ALL INFORMATION AND TO ENSURE NO CHANGES, ALTERATIONS, OR MODIFICATIONS HAVE BEEN MADE. RELIANCE SHALL NOT BE MADE ON A DOCUMENT TRANSMITTED BY COMPUTER OR OTHER ELECTRONIC MEANS UNLESS FIRST COMPARED TO THE ORIGINAL SEALED DOCUMENT ISSUED AT THE TIME OF THE SURVEY. DUE TO THE CRITICAL NATURE OF SURVEYING, DATA ACQUISITION, AND AUTOCAD PLAN DEVELOPMENT, IF CRITICAL DIMENSIONAL INFORMATION IS NEEDED AND IS NOT SPECIFICALLY SHOWN ON THE ELECTRONIC DRAWING FILE, PLEASE CONTACT NITSCH ENGINEERING.



LEGEND

Symbol	Description
	CATCH BASIN
Ⓒ	CABLE TELEVISION MANHOLE
Ⓓ	DRAIN MANHOLE
Ⓔ	ELECTRIC MANHOLE
Ⓜ	MISCELLANEOUS MANHOLE
Ⓢ	SEWER MANHOLE
Ⓣ	TELEPHONE MANHOLE
Ⓦ	WATER MANHOLE
GSO	GAS SHUT–OFF
WSO	WATER SHUT–OFF
GG	GAS GATE
WG	WATER GATE
ICV	IRRIGATION CONTROL VALVE
CLEANOUT	CLEANOUT
BWW	BOSTON WATER WORKS
	FIRE HYDRANT
DS	DOWN SPOUT
UP	UTILITY POLE
UP W/ UE	UTILITY POLE WITH CONDUIT LINE TO GROUND
	LIGHT POLE
LB	LIGHT BOLLARD
LL	LANDSCAPE LIGHT
HH	HAND HOLE
TC	TRASH CAN
FACB	FIRE ALARM CALL BOX
MP	METAL POST
CP	CONCRETE POST
PM	PARKING METER
S	SIGN POST
TMA	TRAFFIC MAST ARM
TRSG	TRAFFIC SIGNAL
PED	PEDESTRIAN SIGNAL
12"	DECIDUOUS TREE WITH TRUNK DIAMETER
12"	CONIFEROUS TREE WITH TRUNK DIAMETER
	HANDICAP PARKING
601x43	SPOT ELEVATION
CLF	CHAIN LINK FENCE
BB	BITUMINOUS CONCRETE BERM
SGC	SLOPED GRANITE CURB
VGC	VERTICAL GRANITE CURB
VCC	VERTICAL CONCRETE CURB
WCR	WHEELCHAIR RAMP
LST	LANDSCAPE TIMBER
R=	RIM ELEVATION EQUALS
I=	INVERT ELEVATION EQUALS
TH=	TOP OF HOOD ELEVATION EQUALS
NPV	NO PIPES VISIBLE
TOW=	TOP OF WATER
TCB	TRAFFIC CONTROL BOX
ULD	UNDERGROUND LOOP DETECTOR
DWP	DETECTABLE WARNING PANEL
601x43TW	TOP OF WALL ELEVATION
—CATV—	UNDERGROUND CABLE TELEVISION LINE
—D—	UNDERGROUND DRAIN LINE
—E—	UNDERGROUND ELECTRIC LINE
—G—	UNDERGROUND GAS LINE
—S—	UNDERGROUND SEWER LINE
—T—	UNDERGROUND TELEPHONE LINE
—W—	UNDERGROUND WATER LINE
—OHW—	OVERHEAD WIRES
	MONITORING WELL
	BENCH MARK

PLANNING BOARD CASE NUMBER __________
APPROVED BY THE EXETER PLANNING BOARD:

CHAIRPERSON

DATE: ________

NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM NAD 83

GRAPHIC SCALE

20 10 0 20 40 60

SCALE: 1"=20'

PURSUANT TO RSA 676:18 III AND RSA 671:14

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN HEREON ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

THIS SURVEY MEETS OR EXCEEDS THE ACCURACY REQUIREMENTS FOR A NEW HAMPSHIRE URBAN SURVEY.

THE INFORMATION SHOWN ON THIS PLAN IS THE RESULT OF AN ON THE GROUND INSTRUMENT SURVEY PERFORMED IN MARCH, APRIL, MAY AND DECEMBER OF 202 AND IN JULY OF 2022.

STATE OF NEW HAMPSHIRE LICENSED LAND SUVEYOR No. 01022 JAMIE G. GAYTON

JAMIE G. GAYTON, PLS #01022 — AUGUST 29. 2022

DATE

Nitsch Engineering

www.nitscheng.com
2 Center Plaza, Suite 430
Boston, MA 02108
T: (617) 338-0063
F: (617) 338-6472

- Civil Engineering
- Land Surveying
- Transportation Engineering
- Structural Engineering
- Green Infrastructure
- Planning
- GIS

EXISTING CONDITIONS

FORD QUAD

PHILLIPS EXETER ACADEMY

PREPARED FOR:

PHILLIPS EXETER ACADEMY

20 MAIN STREET, EXETER, NH 03833

REV.	COMMENTS	DATE
2	DRAIN ADDITIONS	8/26/22
1	UTILITY CONFIRMATIONS	8/11/22

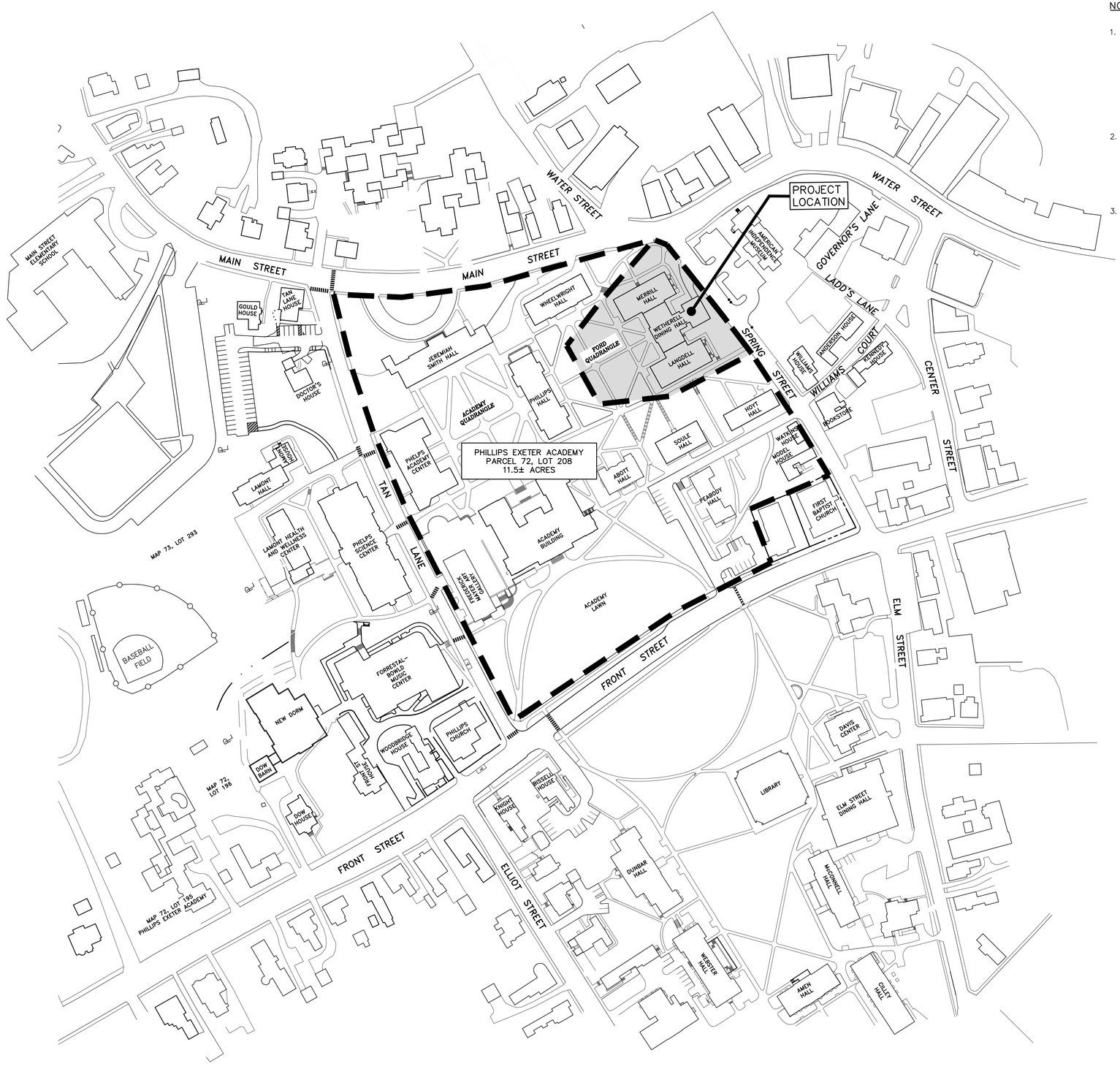
REVISIONS

PROJECT #	13418.3
FILE:	13418.3_TOPO1_M-W-L.dwg
SCALE:	1"=20'
DATE:	MAY 28, 2021
DES./COMP:	JGG
FIELD BOOK:	686
DRAFTED BY:	CPH
CHECKED BY:	

SHEET:

EX-1

OF I REV.



GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

NOTES:

1. THE PROPOSED PROJECT WILL DEMOLISH THE EXISTING WETHERELL DINING HALL FOR THE CONSTRUCTION OF A NEW DINING IN THE APPROXIMATE SAME LOCATION. THE DINING HALL IS SITUATED BETWEEN LANGDELL HALL AND MERRILL HALL, WHICH ARE STUDENT DORMITORIES WITH FACULTY HOUSING. THE TWO DORMITORIES WILL BE RENOVATED INTERNALLY TO BRING THE ROOMS UP TO CURRENT CODES. THERE WILL BE MINOR EXTERIOR IMPROVEMENTS TO THE DORMITORIES, PRIMARILY ON THE SPRING STREET SIDE WHICH WILL HAVE NEW ENTRYWAYS CONSTRUCTED.
2. THE PRIMARY ACCESS TO THE SITE IS FROM SPRING STREET, WHICH IS A ONE-WAY STREET IN THE NORTHBOUND DIRECTION. PHILLIPS EXETER ACADEMY ALSO OWNS A TWELVE CAR PARKING LOT ACROSS SPRING STREET AND ADJACENT TO THE AMERICAN INDEPENDENT MUSEUM LOT, WHICH CAN BE UTILIZED FOR CONSTRUCTION STAGING AND CONTRACTOR PARKING DURING CONSTRUCTION.
3. THE SITE IS SITUATED ON AN APPROXIMATE 11.5 ACRE LOT (PARCEL 72, LOT 208) THAT ALSO INCLUDES NUMEROUS OTHER INSTITUTIONAL BUILDINGS FOR PHILLIPS EXETER ACADEMY.

CASE #22-12

TOWN OF EXETER PROJECT REFERENCE

ENGINEER:

ALTUS ENGINEERING, INC.

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE · CORY D BELDEN No. 14239 · LICENSED PROFESSIONAL ENGINEER · 8/29/22

ARCHITECT:

ROBERT A.M. STERN ARCHITECTS, LLP.

ONE PARK AVENUE, NEW YORK, NEW YORK 10016
TEL (212) 967-5100 | FAX (212) 967-5588

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ISSUED FOR:

PLANNING BOARD APPROVAL

ISSUE DATE:

AUGUST 29, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB APPLICATION	CDB	07/11/22
1	TRC COMMENTS	CDB	08/29/22

DRAWN BY: CDB

APPROVED BY:

DRAWING FILE: 5146SITE.DWG

SCALE: (24"x36") 1"=20'

OWNER/APPLICANT:

SIGILL PHILLIP EXONIENSIS ACADEMIA · XAPITI GEOT · FINIS ORIGINE PENDET · NOV HAN 1781 ·

Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:

PHILLIPS EXETER ACADEMY

WETHERELL, LANGDELL & MERRILL REPLACEMENT AND RENOVATION PROJECT

EXETER, NH 03833

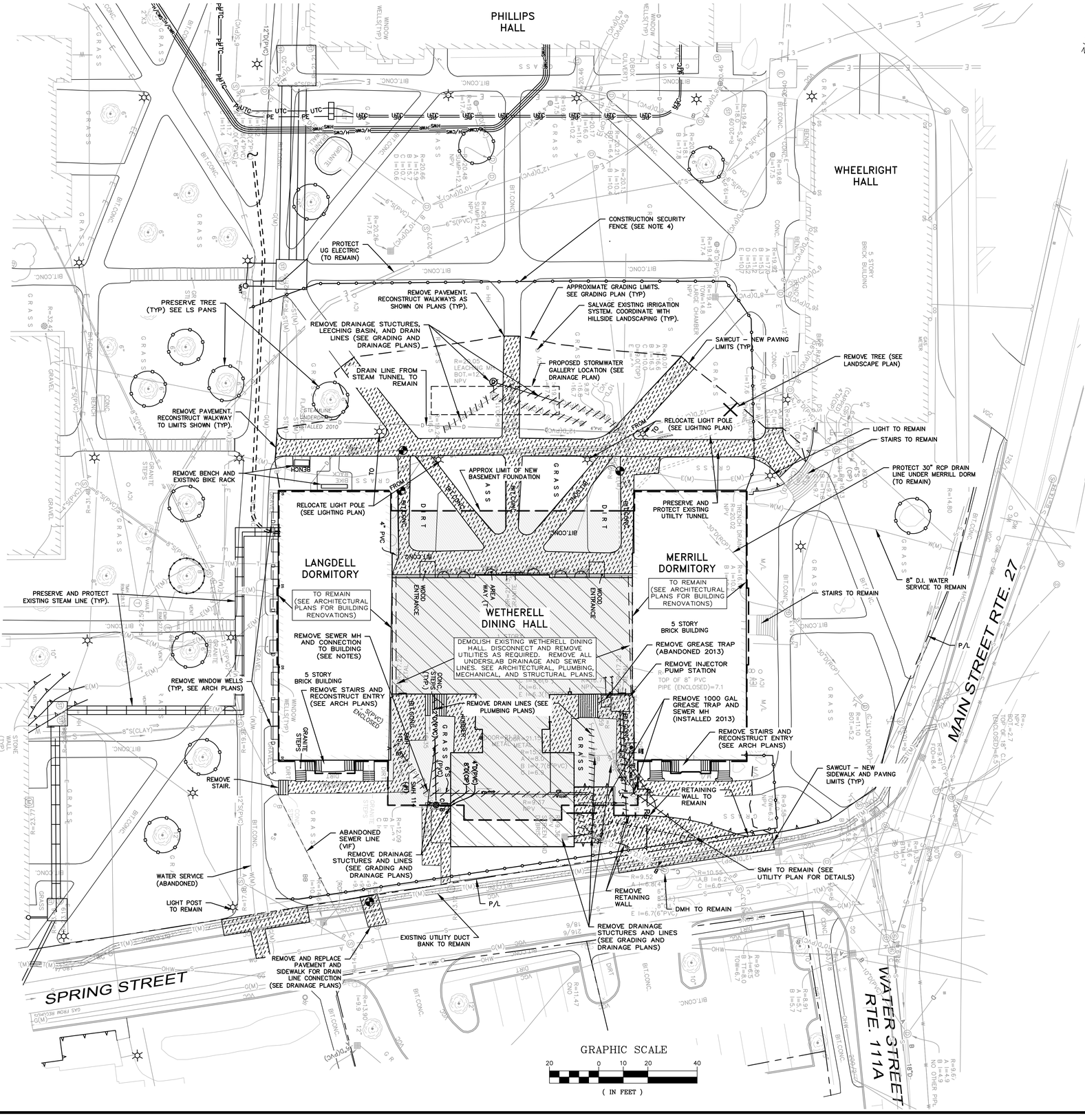
TITLE:

AREA PLAN

SHEET NUMBER:

C1.0

P5146



SITE PREPARATION NOTES:

1. THIS DEMOLITION PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR THE DEMOLITION OF EXISTING SITE FEATURES AND TO SHOW THE MAJOR ITEMS OF WORK REQUIRED FOR PREPARING THE SITE FOR THE CONSTRUCTION OF THE PROPOSED PROJECT. UNLESS OTHERWISE NOTED TO REMAIN, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL PAVEMENT, CONCRETE, CURBING, SIGNS, POLES, UTILITIES, FENCES, VEGETATION AND OTHER EXISTING FEATURES, AS NECESSARY TO FULLY CONSTRUCT THE PROJECT. THE CONTRACTOR SHALL INSPECT THE SITE PRIOR TO BIDDING AND BE RESPONSIBLE FOR PREPARING THE SITE FOR CONSTRUCTION AS NEEDED TO COMPLETE THE PROPOSED IMPROVEMENTS.
2. IF PROJECT DISTURBANCE AREA EXCEEDS ONE (1) ACRE, A STORMWATER POLLUTION PROTECTION PLAN (SWPPP) AND NPDES GENERAL CONSTRUCTION PERMIT ARE REQUIRED. CONTRACTOR SHALL FILE A NOTICE OF INTENT (NOI) WITH THE U.S.E.P.A. UNDER THE NPDES CONSTRUCTION GENERAL PERMIT.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND VERIFY ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR ANY DAMAGE DONE TO EXISTING UTILITIES AT NO EXTRA COST TO THE OWNER. UTILITY CONFLICTS SHALL BE RESOLVED WITH THE INVOLVEMENT OF THE ENGINEER, OWNER, AND APPROPRIATE UTILITY COMPANIES.
4. CONTRACTOR SHALL SAFELY SECURE THE SITE WITH SECURITY FENCING. FENCING SHALL BE LOCKED DURING NON-WORK HOURS.
5. TOWN DEMOLITION PERMIT IS REQUIRED PRIOR TO ANY DEMOLITION ACTIVITIES. CONTRACTOR IS NOTIFIED THAT THIS PERMIT PROCESS MAY REQUIRE A 30-DAY LEAD TIME.
6. CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES SCHEDULED TO REMAIN.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY NOTIFICATION OF ALL PARTIES, CORPORATIONS, COMPANIES, INDIVIDUALS AND STATE AND LOCAL AUTHORITIES OWNING AND/OR HAVING JURISDICTION OVER ANY UTILITIES RUNNING TO, THROUGH OR ACROSS AREAS TO BE DISTURBED BY DEMOLITION AND/OR CONSTRUCTION ACTIVITIES WHETHER OR NOT SAID UTILITIES ARE SUBJECT TO DEMOLITION, RELOCATION, MODIFICATION AND/OR CONSTRUCTION.
8. ALL UTILITY DISCONNECTIONS/DEMOLITIONS/RELOCATIONS TO BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES AND THE EXETER DEPARTMENT OF PUBLIC WORKS. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELATED EXCAVATION, TRENCHING AND BACKFILLING.
9. WHERE SPECIFIED TO REMAIN, MANHOLE RIMS, CATCH BASIN GRATES, VALVE COVERS, HANDHOLES MONITORING WELLS, ETC. SHALL BE ADJUSTED TO FINISH GRADE.
10. NO BURNING SHALL BE PERMITTED PER LOCAL REGULATIONS.
11. HAZARDOUS MATERIALS ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL REGULATIONS.
12. THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG THE PROPERTY LINE IN ALL AREAS WHERE SILT FENCING IS NOT OTHERWISE REQUIRED.
13. SEE EROSION CONTROL PLANS FOR EROSION CONTROL REQUIREMENTS TO BE IN PLACE PRIOR TO START OF DEMOLITION ACTIVITIES, INCLUDING, BUT NOT LIMITED TO; SEDIMENT BARRIERS, STABILIZED CONSTRUCTION SITE EXIT, AND STORM DRAIN INLET PROTECTION.
14. ALL DEMOLISHED MATERIALS OR MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
15. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BE LEGALLY DISPOSED IN ACCORDANCE WITH ALL LOCAL, STATE & FEDERAL REGULATIONS AND CODES.
16. INSTALL STABILIZED CONSTRUCTION EXIT; MAINTAIN AND RELOCATE DURING CONSTRUCTION, AS NEEDED BASED ON ACTIVE CONSTRUCTION STAGES.
17. CONTRACTOR TO PREPARE CONSTRUCTION LOGISTICS PLANS TO ADDRESS MATERIALS STORAGE, CONSTRUCTION ACCESS, CONTRACTOR PARKING, AND CIRCULATION FOR ALL PROJECT PHASES. IF THE TOTAL SITE DISTURBANCE EXCEEDS ONE ACRE, THE SITE WORK WILL REQUIRE AN NPDES CONSTRUCTION GENERAL PERMIT WITH USEPA, SEE NOTE 2.

⊕ TEST PIT LOCATION TO VERIFY UTILITY LOCATION AND ELEVATION. ALL POTENTIAL UTILITY CONFILCTS TO BE VERIFIED PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF ANY CONFLICTS IMMEDIATELY FOR RESOLUTION. ADDITIONAL TEST PITS MAY BE REQUIRED BY CONTRACTOR TO VERIFY EXISTING UTILITIES.

CASE #22-12
TOWN OF EXETER PROJECT REFERENCE

ENGINEER:
ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – CORY D. BELDEN No. 14239 LICENSED PROFESSIONAL ENGINEER
8/29/22

ARCHITECT:
ROBERT A.M. STERN ARCHITECTS, LLP.
ONE PARK AVENUE, NEW YORK, NEW YORK 10016
TEL (212) 967-5100 | FAX (212) 967-5588

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0	PB APPLICATION	CDB	07/11/22
1	TRC COMMENTS	CDB	08/29/22

DRAWN BY: CDB
APPROVED BY:
DRAWING FILE: 5146SITE.DWG

SCALE:
(24"x36") 1"=20'

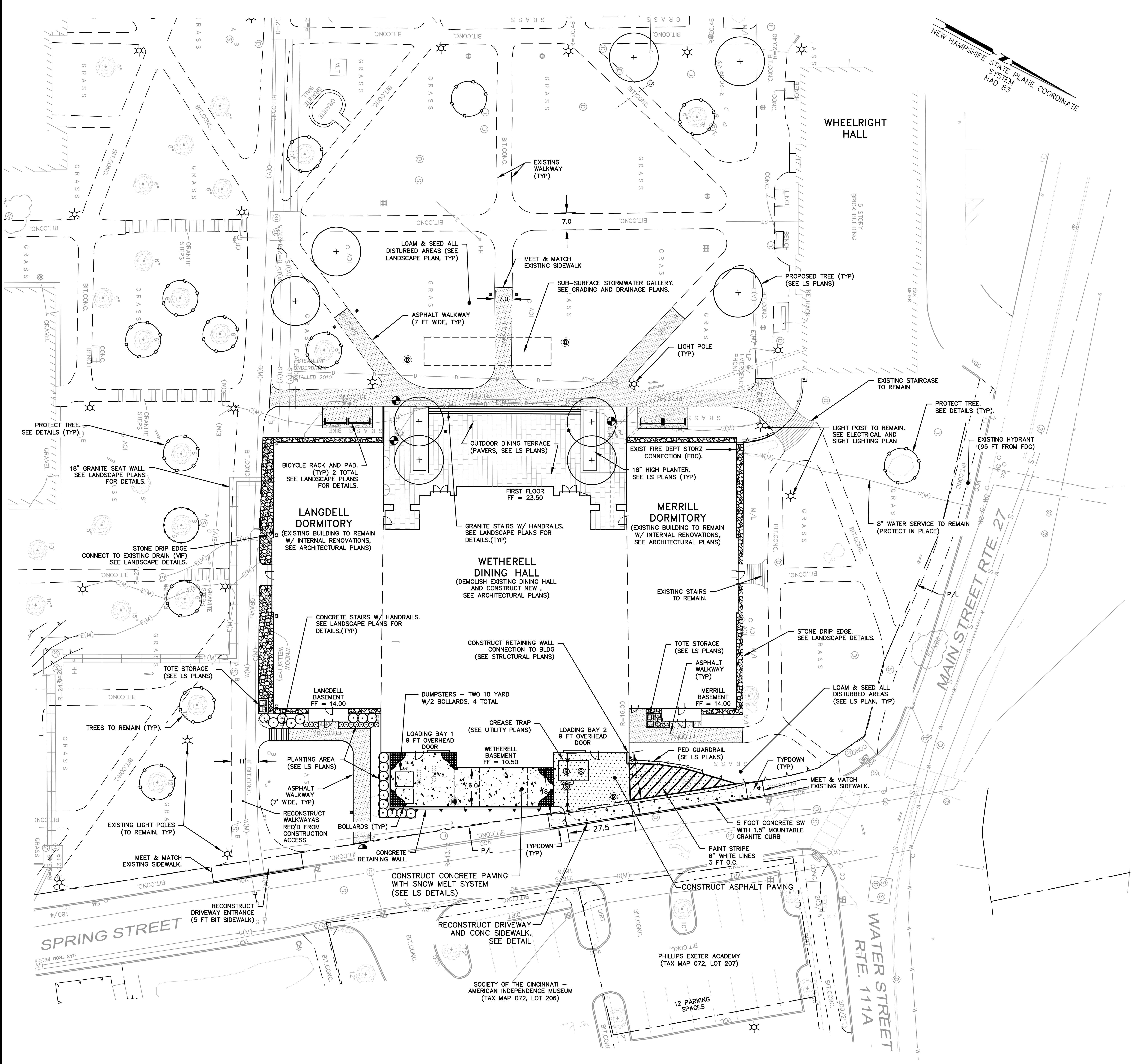
OWNER/APPLICANT:
SCHOLA PHILLIP EXONIENSIS ACADEMIA – XAPITI GEOT – FINIS ORIGINE PENDET – NOV MAN 1781
Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:
PHILLIPS EXETER ACADEMY
WETHERELL, LANGDELL, & MERRILL REPLACEMENT AND RENOVATION PROJECT
EXETER, NH 03833

TITLE:
SITE PREPARATION PLAN

SHEET NUMBER:
C2.0

P5146



P5146

ZONING SUMMARY:

OWNER OF RECORD / APPLICANT:

PHILLIPS EXETER ACADEMY
20 MAIN STREET
EXETER, NEW HAMPSHIRE 03833
603–777–4442

TAX MAP 72, LOT 208
PROPERTY ADDRESS: SPRING STREET
ZONED R–2, RURAL SINGLE FAMILY RESIDENCE

PARKING SUMMARY

- OFF–STREET PARKING:
  EXISTING: 12 SPACES (ACROSS SPRING STREET)
- ADDITIONAL PARKING IS AVAILABLE FOR FACULTY AND EMPLOYEES ON CAMPUS

REFERENCE PLAN:

1. EXISTING CONDITIONS SURVEY PERFORMED AND PROVIDED BY NITSCH ENGINEERING, DATED MARCH 3, 2022.

SITE NOTES

1. THE PROPOSED SITE PLAN REQUIRES APPROVAL FROM THE EXETER PLANNING BOARD.
2. ALL WATER, SEWER, ROAD (INCLUDING PARKING LOT), AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.3 STORMWATER MANAGEMENT STANDARDS, STORMWATER MANAGEMENT PLAN, STORMWATER POLLUTION PREVENTION PLAN, AND EROSION AND SEDIMENT CONTROL STANDARDS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE.
3. TWO BICYCLE RACKS WILL BE PROVIDED , ONE IN FRONT OF EACH DORMITORY BUILDING.
4. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
5. ALL CONDITIONS OF THIS APPROVAL SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
6. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE TOWN OF EXETER & NHDOT'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
9. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PRIOR TO CONSTRUCTION. ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION.
10. IF THE AREA OF DISTURBANCE IS OVER 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT IS REQUIRED. CONTRACTOR TO COMPLY WITH LOCAL REQUIREMENTS FOR STORMWATER MANAGMENT DURING CONSTRUCTION.
11. IF ADEQUATE ON-SITE SNOW STORAGE IS NOT AVAILABLE, THE SNOW SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED.
12. SIGNS SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC DEVICES," "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" AND THE AMERICANS WITH DISABILITIES ACT (ADA), LATEST EDITIONS.
13. SITEWORK CONTRACTOR SHALL PREPARE A LICENSED LAND SURVEYOR (LLS) STAMPED AS-BUILT SITE PLAN & PROVIDE A DIGITAL (CAD FORMAT) COPY FOR THE TOWN'S G.I.S. DATA BASE.

CASE #22-12
TOWN OF EXETER PROJECT REFERENCE

ENGINEER:
ALTUS ENGINEERING, INC.
133 Court Street, Portsmouth, NH 03801
(603) 433-2335, www.altus-eng.com

STATE OF NEW HAMPSHIRE
CORY D. BELDEN
No. 14230
LICENSED
PROFESSIONAL ENGINEER
8/29/22

ARCHITECT:
ROBERT A.M. STERN ARCHITECTS, LLP.
ONE PARK AVENUE, NEW YORK, NEW YORK 10016
TEL (212) 967-5100|FAX (212) 967-5588

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1	TRC COMMENTS	CDB	08/29/22

DRAWN BY: CDB
APPROVED BY:
DRAWING FILE: 5146SITE.DWG

SCALE:
(24"x36") 1"=20'

OWNER/APPLICANT:

Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

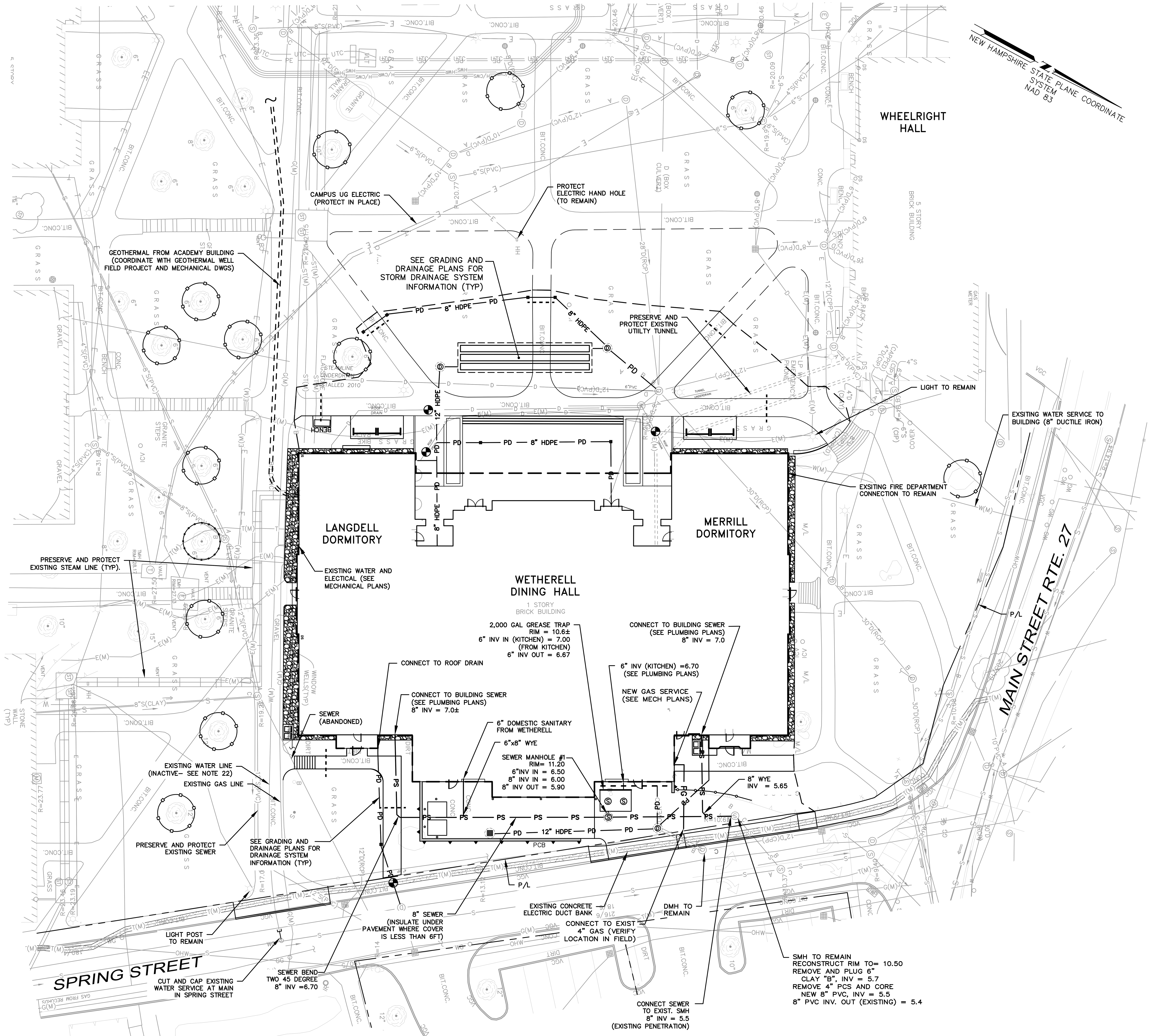
PROJECT:
PHILLIPS EXETER ACADEMY

WETHERELL, LANGDELL, & MERRILL REPLACEMENT AND RENOVATION PROJECT

EXETER, NH 03833

TITLE:
SITE PLAN

SHEET NUMBER:
C3.0



UTILITY NOTES:

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE, LOCAL, AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED. CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH ALL PERMIT CONDITIONS AND REQUIREMENTS.
2. ALL WATER, SEWER, ROAD (INCLUDING PARKING LOT), AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.3 STORMWATER MANAGEMENT STANDARDS, STORMWATER MANAGEMENT PLAN, STORMWATER POLLUTION PREVENTION PLAN, AND EROSION AND SEDIMENT CONTROL STANDARDS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND VERIFY ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR ANY DAMAGE DONE TO EXISTING UTILITIES AT NO EXTRA COST TO THE OWNER.
4. CONTRACTOR SHALL VERIFY THE EXACT LOCATION & ELEVATIONS OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. ANY DISCREPANCIES BETWEEN FIELD AND PLAN SHALL BE IMMEDIATELY REPORTED TO ENGINEER.
5. ALL WORK WITHIN SPRING STREET WILL REQUIRE TOWN EXETER POLICE DETAIL FOR TRAFFIC CONTROL AT THE OWNERS EXPENSE. CONTRACTOR SHALL COORDINATE WITH TOWN OF EXETER DPW AND POLICE DEPARTMENT FOR REQUIREMENTS.
6. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL OSHA AND CITY REGULATIONS.
7. SEE ARCHITECTURAL/MECHANICAL/ELECTRICAL DRAWINGS FOR LOCATIONS & ELEVATIONS OF UTILITY CONNECTIONS AT BUILDINGS. ALL CONFLICTS AND DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY AND PRIOR TO COMMENCING RELATED WORK.
8. TRANSFORMER SHALL BE PAD MOUNTED. COORDINATE WITH ARCHITECT & UILITY.
9. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
10. CONTRACTOR SHALL CONTACT EXETER DEPARTMENT OF PUBLIC WORKS TO COORDINATE INSPECTION OF ALL MUNICIPAL UTILITY WORK. THE TESTING OF THE MUNICIPAL SEWER INFRASTRUCTURE IMPROVEMENTS SHALL BE UNDER THE SUPERVISION OF THE EXETER DEPARTMENT OF PUBLIC WORKS (DPW).
11. CONTRACTOR SHALL COORDINATE UTILITY WORK WITH UTILITY COMPANIES AS REQUIRED.
12. ALL ELECTRIC, CABLE, AND TELECOMMUNICATION SERVICES AND CONDUITS SHALL BE LOCATED UNDERGROUND AS SHOWN. UNDERGROUND UTILITIES INSTALLATIONS SHALL MEET THE MINIMUM REQUIREMENTS OF TOWN OF EXETER AND UTILITY COMPANIES. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING IN CABLES.
13. SEE ELECTRICAL SITE PLAN FOR TYPICAL ELECTRIC/COMMUNICATION CONDUIT TRENCH SECTION.
14. VERIFY LOCATION OF UTILITY BOXES WITH OWNER AND UTILITY COMPANIES.
15. ALL UTILITY STRUCTURES SHALL BE SET FLUSH WITH PROPOSED GRADES.
16. THE CONTRACTOR MUST OBTAIN A VALID UTILITY PIPE INSTALLER'S LICENSE AND THE JOB SUPERVISOR OR FOREMAN MUST BE CERTIFIED BY THE TOWN, PRIOR TO WORKING ON ANY WATER, SEWER OR DRAINAGE PIPES THAT ARE IN A TOWN STREET OR RIGHT-OF-WAY, OR THAT WILL CONNECT OR MAY BE CONNECTED, TO A TOWN WATER, SEWER OR DRAINAGE SYSTEM. A CERTIFIED SUPERVISOR OR FOREMAN MUST BE PRESENT AT THE JOB SITE AT ALL TIMES DURING CONSTRUCTION.
17. CONTRACTOR SHALL PERFORM A TEST PIT TO DETERMINE EXISTING WATER LINE SIZE AND DEPTH PRIOR TO START OF CONSTRUCTION.
18. SEWER LINE SHALL BE INSULATED WITHIN 5 FEET OF DRAINAGE STRUCTURES.
19. CONTRACTOR TO VERIFY WATER SERVICE REQUIREMENTS WITH MECHANICAL ENGINEER.
20. PROPOSED ELECTRICAL IMPROVEMENTS NOT SHOWN ON THIS PLAN. SEE SITE ELECTRICAL PLAN.
21. GREASE TRAP SIZE IS BASED ON 720 TOTAL MEALS SERVED PER DAY. TOWN REQUIREMENT IS 2.5 GALLONS PER PATRON SERVED, WHICH REQUIRES A 1,800 GAL GREASE TRAP. A 2,000 GAL GREASE TRAP IS PROVIDED.
22. THE WATER SERVICE TO LANGDELL HALL FROM SPRING STREET HAS BEEN SHUT OFF AND IS INACTIVE. THE WATER LINE WAS CUT AND CAPPED INSIDE LANGDELL HALL. THE CONTRATOR SHALL CUT AND THE CAP THE WATER LINE FROM THE SERVICE POINT IN SPRING STREET TO FULLY ABANDON THE SERVICE LINE. COORDINATE WITH TOWN OF EXETER WATER DEPT FOR ALL WATER WORK IN SPRING STREET.

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)

P5146

CASE #22-12

TOWN OF EXETER PROJECT REFERENCE

ENGINEER:

ALTUS ENGINEERING, INC.
133 Court Street, Portsmouth, NH 03801
(603) 433-2335, www.altus-eng.com

STATE OF NEW HAMPSHIRE CORY D. BELDEN No. 14230 LICENSED PROFESSIONAL ENGINEER 8/29/22

ARCHITECT:

ROBERT A.M. STERN ARCHITECTS, LLP.
ONE PARK AVENUE, NEW YORK, NEW YORK 10016
TEL (212) 967-5100 | FAX (212) 967-5588

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:

PLANNING BOARD APPROVAL

ISSUE DATE:

AUGUST 29, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB APPLICATION	CDB	07/11/22
1	TRC COMMENTS	CDB	08/29/22

DRAWN BY: CDB

APPROVED BY:

DRAWING FILE: 5146SITE.DWG

SCALE: (24"x36") 1"=20'

OWNER/APPLICANT:

SIGILL PHILLIP EXONIENSIS ACADEMIAE · NOV HAN 1781 · FINIS ORIGINE PENDET

Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:

PHILLIPS EXETER ACADEMY

WETHERELL, LANGDELL, & MERRILL REPLACEMENT AND RENOVATION PROJECT

EXETER, NH 03833

TITLE:

UTILITIES PLAN

SHEET NUMBER:

C4.0

* NOTE: ALL STORM DRAIN PIPING SHALL BE HDPE, UNLESS OTHERWISE NOTED

STORMWATER PRACTICES

STORMWATER GALLERY A
30" DIA PERF PIPE
3 ROWS / 50 FT LENGTH
PIPE INV = 15.25
ROCK BOTTOM = 14.75
ROCK TOP = 18.25

DRAINAGE STRUCTURES

PDMH = PROPOSED DRAIN MANHOLE
PCB = PROPOSED CATCH BASIN
PYD = PROPOSED YARD DRAIN

PYD #1
RIM = 20.00
8" INV OUT =16.50 (PYD2)

PYD #2
RIM = 20.00
8" INV IN=16.40 (PYD1)
8" INV OUT =16.30 (PYD3)

PYD #3
RIM = 20.10
8" INV IN=16.00 (PYD2)
8" INV OUT =15.90 (PYD4)

PYD #4
RIM = 20.10
8" INV IN=15.80 (PAD3)
8" INV OUT =15.70 (PDMH2)

PYD #5
RIM = 13.00
4" INV IN=9.80 (ROOF)
8" INV OUT =9.70 (PCB1)

PCB #6
RIM = 10.15
12" INV OUT = 6.75 (PDMH3)
W/ HOOD

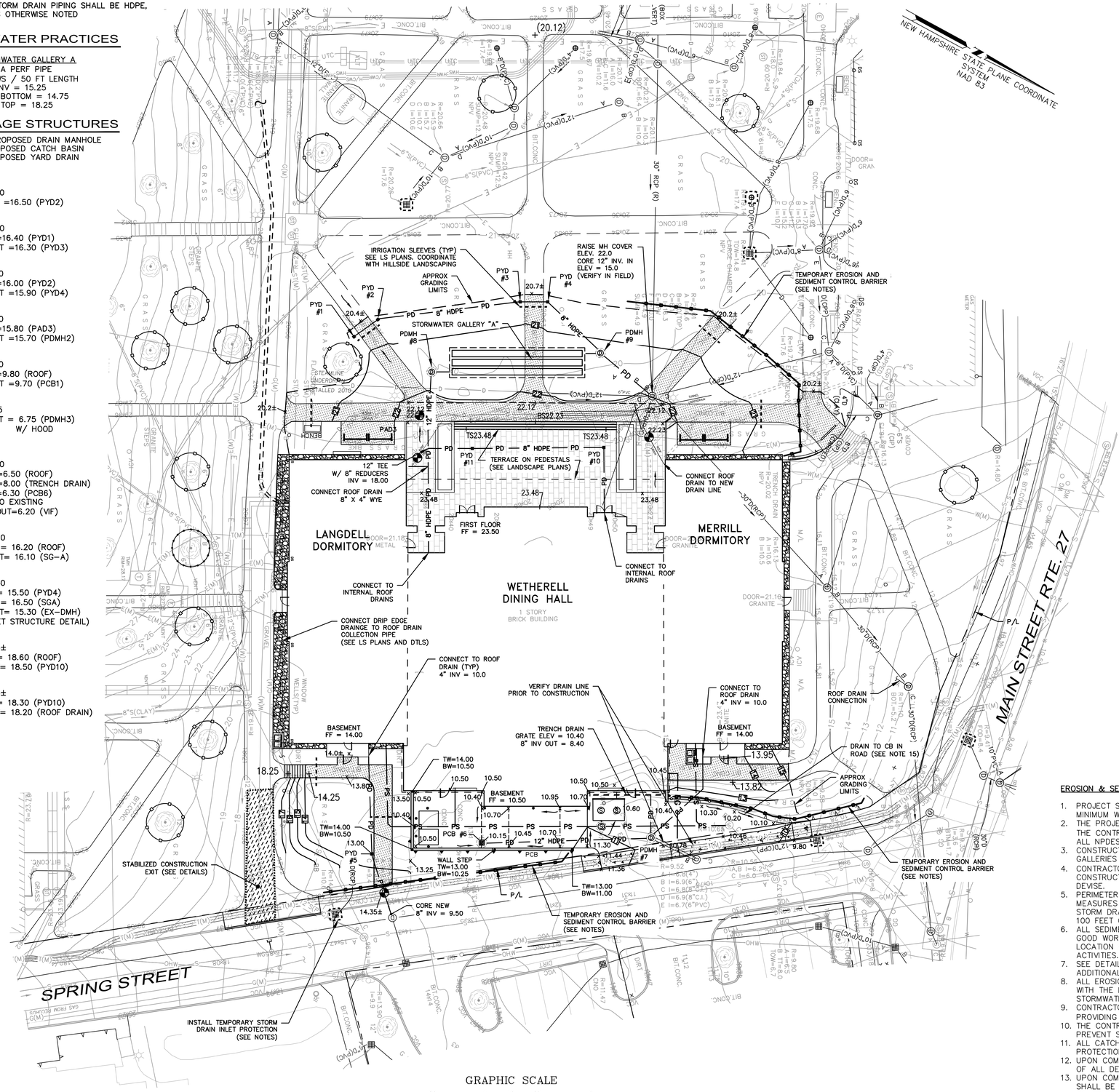
PDMH #7
RIM = 10.70
4" INV IN=6.50 (ROOF)
8" INV IN =8.00 (TRENCH DRAIN)
12" INV IN=6.30 (PCB6)
CONNECT TO EXISTING
2-8" INV OUT=6.20 (VIF)

PDMH #8
RIM = 20.60
12" INV IN= 16.20 (ROOF)
12" INV OUT= 16.10 (SG-A)

PDMH #9
RIM = 20.40
8" INV IN = 15.50 (PYD4)
12" INV IN= 16.50 (SGA)
12" INV OUT= 15.30 (EX-DMH)
(SEE OUTLET STRUCTURE DETAIL)

PYD #10
RIM = 22.5±
8" INV IN= 18.60 (ROOF)
8" INV OUT= 18.50 (PYD10)

PYD #11
RIM = 22.5±
8" INV IN= 18.30 (PYD10)
8" INV OUT= 18.20 (ROOF DRAIN)



GRADING AND DRAINAGE NOTES

1. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL FIELD VERIFY LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES SCHEDULED TO REMAIN.
2. ALL WATER, SEWER, ROAD (INCLUDING PARKING LOT), AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.3 STORMWATER MANAGEMENT STANDARDS, STORMWATER MANAGEMENT PLAN, STORMWATER POLLUTION PREVENTION PLAN, AND EROSION AND SEDIMENT CONTROL STANDARDS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE.
3. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL READ AND FAMILIARIZE THEMSELVES WITH THE PROJECT GEOTECHNICAL REPORT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING ALL THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT.
5. DEWATERING ACTIVITIES SHALL BE DONE IN ACCORDANCE WITH EPA AND NHDES REGULATIONS AND GUIDELINES.
6. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES AREA SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS DEGREE OF INSULATION AGAINST FREEZING.
7. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
8. ALL STORM DRAIN PIPE SHALL BE ADS N-12 OR EQUAL AND APPROVED BY THE ENGINEER.
9. ALL CATCH BASIN, GATE VALVE COVERS, AND MANHOLE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISHED GRADE. ANY RIM OR VALVE COVER ABOVE SURROUNDING FINISHED GRADE WILL NOT BE ACCEPTED.
10. ALL CATCH BASINS SHALL BE PRECAST, H-20 LOADING AND BE EQUIPPED WITH 4-FOOT DEEP MIN SEDIMENTATION SUMPS AND GREASE HOODS. (SEE DETAILS)
11. ALL SPOT GRADES ARE AT THE FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
12. UNLESS OTHERWISE SPECIFIED, RETAINING WALL AND BUILDING PERIMETER DRAINS SHALL BE DIRECTED TO THE NEAREST DRAINAGE STRUCTURE. IF DEEMED APPROPRIATE, CONTRACTOR SHALL PROVIDE ADDITIONAL UNDERDRAINS AT THE DIRECTION OF THE ENGINEER.
13. RETAINING WALL FINISH TO BE SELECTED BY OWNER.
14. CONTRACTOR SHALL PROTECT ALL STORMWATER FACILITIES FROM CONSTRUCTION RUNOFF UNTIL THE WATERSHED AREA HAS BEEN STABILIZED.
15. CONTRACTOR SHALL GRADE THE BASE OF RETAINING WALL TO PROVIDE POSSITIVE DRAINAGE TO EXISTING CATCH BASIN IN SPRING STREET.

EROSION & SEDIMENT CONTROL NOTES:

1. PROJECT SUBJECT TO EPA NPDES GENERAL CONSTRUCTION PERMIT, NOI, SWPPP AND MINIMUM WEEKLY INSPECTIONS REQUIRED.
2. THE PROJECT REQUIRES A SWPPP THAT WILL BE MANAGED THROUGHOUT CONSTRUCTION BY THE CONTRACTOR. IT IS THE OWNER AND CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH ALL NPDES AND LOCAL REQUIREMENTS.
3. CONSTRUCTION STORMWATER SHALL NOT BE DIRECTED TO PROPOSED STORMWATER GALLERIES BEFORE SITE IS STABILIZED.
4. CONTRACTOR SHALL CONSTRUCT SEDIMENT TRAPS/BASINS FOR STORMWATER DURING CONSTRUCTION. SIZE AND LOCATION WILL DEPEND ON THE AREA DRAINING TO EACH DEVISE.
5. PERIMETER SEDIMENT CONTROLS AND CULVERT AND CATCH BASIN INLET PROTECTION MEASURES SHALL BE INSTALLED PRIOR TO EARTH DISTURBANCE ACTIVITIES. TEMPORARY STORM DRAIN INLET PROTECTION SHALL BE PLACED ON ALL CATCH BASIN INLETS WITHIN 100 FEET OF CONSTRUCTION ACTIVITIES.
6. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED. LOCATION OF CONTROL DEVICES MAY VARY DEPENDING ON CURRENT CONSTRUCTION ACTIVITIES.
7. SEE DETAIL SHEETS FOR PERTINENT SEDIMENT AND EROSION CONTROL DETAILS AND ADDITIONAL NOTES.
8. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH IN THE NHDES NH STORMWATER MANUALS, VOL. 1-3, DATED DECEMBER 2008 AS AMENDED.
9. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
10. THE CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND ENSURE PERMANENT SOIL STABILIZATION.
11. ALL CATCH BASINS AND CULVERTS SHALL BE PROVIDED APPROPRIATE TEMPORARY INLET PROTECTION.
12. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
13. UPON COMPLETION OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
14. CONSTRUCTION ACTIVITIES SHALL BE MANAGED IN STRICT ACCORDANCE WITH NH RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES. NO INVASIVE SPECIES SHALL BE INSTALLED ON THE PROJECT SITE FOR ANY REASON.

CASE #22-12
TOWN OF EXETER PROJECT REFERENCE

ENGINEER:
ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - CORY D BELDEN No. 14239 LICENSED PROFESSIONAL ENGINEER
8/29/22

ARCHITECT:
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TEL (212) 967-5100 FAX (212) 967-5588

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ISSUED FOR:
PLANNING BOARD APPROVAL

ISSUE DATE:
AUGUST 29, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB APPLICATION	CDB	07/11/22
1	TRC COMMENTS	CDB	08/29/22

DRAWN BY: CDB
APPROVED BY:
DRAWING FILE: 5146SITE.DWG

SCALE: (24"x36") 1"=20'

OWNER/APPLICANT:
SIGILLVM PHILLIP EXONIENSIS ACADEMIÆ - XAPITI GEOT - FINIS ORIGINE PENDET - NOV HAN 1781
Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:
PHILLIPS EXETER ACADEMY
WETHERELL, LANGDELL, & MERRILL REPLACEMENT AND RENOVATION PROJECT
EXETER, NH 03833

TITLE:
GRADING, DRAINAGE AND EROSON CONTROL PLAN

SHEET NUMBER:
C5.0

P5146

PROJECT NAME AND LOCATION

Applicant:
Phillips Exeter Academy
20 Main Street
Exeter, NH 03820

LATITUDE: 042° 58' 345" N
LONGITUDE: 070° 57' 17" W

DESCRIPTION

The site work for the project consists of building reconstruction, site improvements and utility installations.

DISTURBED AREA

The total area to be disturbed is approximately 38,000 square feet.

NPDES CONSTRUCTION GENERAL PERMIT

If site disturbance exceeds 1 acre (43,560 square feet), Contractor shall prepare a Stormwater Pollution Prevention Plan (SWPPP) in accordance with federal storm water permit requirements. The SWPPP must be prepared in a format acceptable to the Owner and three (3) copies provided to the Town at least fourteen (14) days prior to initiating construction. Contractor is responsible for all cost associated with preparation and implementation of SWPPP including any temporary erosion control measures (whether indicated or not on these drawings) as required for the contractor's sequence of activities. The Contractor and Owner shall each file a Notice of Intent (NOI) with the U.S.E.P.A. under the NPDES Construction General Permit. (U.S.E.P.A., 1200 Pennsylvania Avenue NW, Washington, DC 20460) All work shall be in accordance with NPDES General Permit: NHR120000, including NOI requirements, effluent limitations, standards and management The Contractor shall be responsible for obtaining a USEPA Construction Dewatering Permit, if required for construction.

NAME OF RECEIVING WATER

Closed drainage system draining into the Squamscott River.

TEMPORARY EROSION AND SEDIMENT CONTROLS AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits.

As indicated in the sequence of Major Activities, the hay bales and silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and hay bale barriers and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion sedimentation measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are the general inspection and maintenance practices that shall be used to implement the plan.

1. The smallest practical portion of the site shall be denuded at one time. The amount of open area shall be determined by an approved "Construction Sequence Plan" which will be prepared by the contractor and submitted to the engineer at least 30 days prior to construction.
2. All control measures shall be inspected at least once each week and following any storm event of 0.5 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built up sediment shall be removed from silt fence or haybale barriers when it has reached one third the height of the fence or bale, or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. A maintenance inspection report shall be made after each inspection.
8. The Contractor's site superintendent shall be responsible for inspections, maintenance and repair activities, and filling out the inspection and maintenance report.
9. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
10. An area shall be considered stable if one of the following has occurred:
    a. Base coarse gravels have been installed in areas to be paved;
    b. A minimum of 85% vegetated growth as been established;
    c. A minimum of 3 inches of non-erosive material such as stone of riprap has been installed or
    d. Erosion control blankets have been properly installed.

B. MULCHING

1. Timing

Mulching – mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards that shall be used to assure this.

a. Apply mulch prior to any storm event.

This is applicable when working within 100 feet of wetlands. It shall be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.

b. Required Mulching within a specified time period.

The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

2. Mulch Application.

Type	Standard rate per 1,000 s.f.	Winter rate per 1,000 s.f.	Use and Comments
Hay or Straw	75–92 lbs.	150–185 lbs.	Must be dry and free from mold. May be used with plantings.
Jute and Fibrous Matting	As per manufacturer Specifications	As per manufacturer Specifications	Used in scope areas, water coursed and other areas.
Crushed Stone 1/4" to 1–1/2" dia.	Spread more than 1/2" thick	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Wood chips or bark mulch	460 to 920 lbs.	–	Used mostly with trees and shrub plantings.
Erosion Control Mix	2" thick min.	Per winter season specification	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6" screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen. * The organic portion needs to be fibrous and elongated. * Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. * The pH should fall between 5.0 and 8.0.

3. Maintenance

All mulches shall be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by the specified thickness of mulch, additional mulch shall be immediately applied.

C. TEMPORARY GRASS COVER

1. Seedbed Preparation

Apply fertilizer at the rate of 600 pounds per acre of 10–10–10. Apply limestone (equivalent to 50 percent calcium plus magnesium oxide) at a rate of three (3) tons per acre.

2. Seeding

a. Utilize annual rye grass at a rate of 40 lbs/acre.

b. Where the soil has been compacted by construction operations, loosen soil to a depth of two (2) inches before applying fertilizer, lime and seed.

c. Apply seed uniformly by hand, cyclone seeder, or hydroseeder (slurry including seed and fertilizer). Hydroseedings, which include mulch, may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.

3. Maintenance

Temporary seedings shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

D. FILTERS

1. Straw/Hay Bales

a. Sheet Flow Applications

1. Bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another.
2. All bales shall be string–tied. Bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales to prevent deterioration of the bindings.
3. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of four (4) inches. After the bales are staked and chinked, the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to four (4) inches against the uphill side of the barrier. Ideally, bales should be placed ten (10) feet away from the toe of slope.
4. Each bale shall be securely anchored by at least two (2) stakes driven through the bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes shall be driven deep enough into the ground to securely anchor the bales.
5. The gaps between bales shall be chinked (filled by wedging) with hay to prevent water from escaping between the bales.

2. Silt Fence

a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM–51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM–52	Extra Strength 50 lb/lin in (min) Standard Strength 30 lb/lin in (min)
Flow Rate	VTM–51	0.3 gal/sf/min (min)

* Requirements reduced by 50 percent after six (6) months of installation.

Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).

c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.

d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.

e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.

f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.

g. The trench shall be backfilled and the soil compacted over the filter fabric.

h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

3. Silt Sock or approved equal

Install and maintain per manufacturer's specifications

4. Sequence of Installation

Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.

5. Maintenance

a. Straw/hay bale barrier and silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary check dam.

b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.

c. Sediment deposits shall be removed when deposits reach approximately one third (1/3) the height of the barrier.

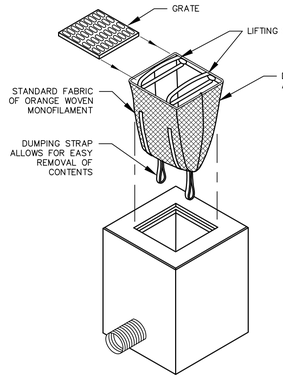
d. Any sediment deposits remaining in place after the silt fence or haybale barrier is no longer required shall be removed. The area shall be prepared and seeded.

e. Additional stone, if needed, shall be added to the construction entrance, stone lined swales, etc., periodically to maintain proper function of the erosion control structure.

1.

E. PERMANENT SEEDING

See Landscape Architect's drawings for details.



INSTALLATION AND MAINTENANCE;

INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

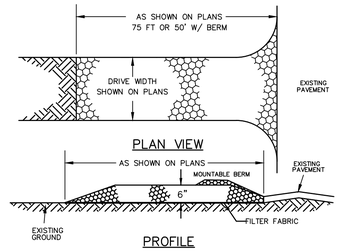
MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD;

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION

NOT TO SCALE



PROFILE

STONE GRADATION TABLE

SIEVE SIZE	% PASSING BY WEIGHT
2 inch	100
1 1/2 inch	90–100
1 inch	20–55
3/4 inch	0–15
3/8 inch	0–5

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – NHDOT STANDARD STONE SIZE #4 – SECTION 703 OF NHDOT STANDARD.
2. LENGTH – DETAILED ON PLANS (75 FT OR 50 FOOT WITH MOUNTABLE BERM –MINIMUM).
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. WIDTH – FULL DRIVE WIDTH UNLESS OTHERWISE SPECIFIED.
5. FILTER FABRIC – MIRAFI 600X OR EQUAL APPROVED BY ENGINEER.
6. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AT ALL ENTRANCES TO PUBLIC RIGHTS–OF–WAY, AT LOCATIONS SHOWN ON THE PLANS, AND/OR WHERE AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION EXIT

NOT TO SCALE

P5146

CASE #22-12
TOWN OF EXETER PROJECT REFERENCE

ENGINEER:
ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE · CORY D. BELDEN No. 14239 · LICENSED PROFESSIONAL ENGINEER · 8/29/22

ARCHITECT:
ROBERT A.M. STERN ARCHITECTS, LLP.
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TEL (212) 967-5100 FAX (212) 967-5588

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ISSUED FOR:
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ISSUE DATE:
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REVISIONS

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DRAWN BY: CDB
APPROVED BY:
DRAWING FILE: 5146_DTLS.DWG

SCALE: (24"x36") 1"=20'

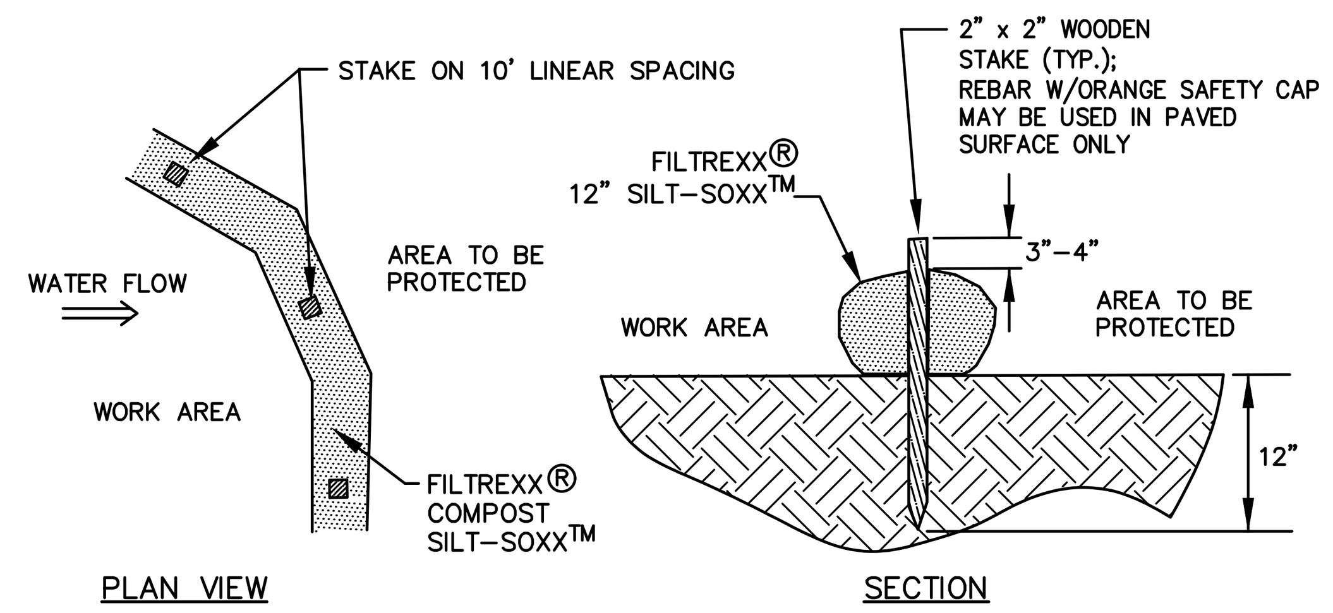
OWNER/APPLICANT:

Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:
PHILLIPS EXETER ACADEMY
WETHERELL, LANGDELL, & MERRILL REPLACEMENT AND RENOVATION PROJECT
EXETER, NH 03833

TITLE:
EROSION CONTROL NOTES AND DETAILS

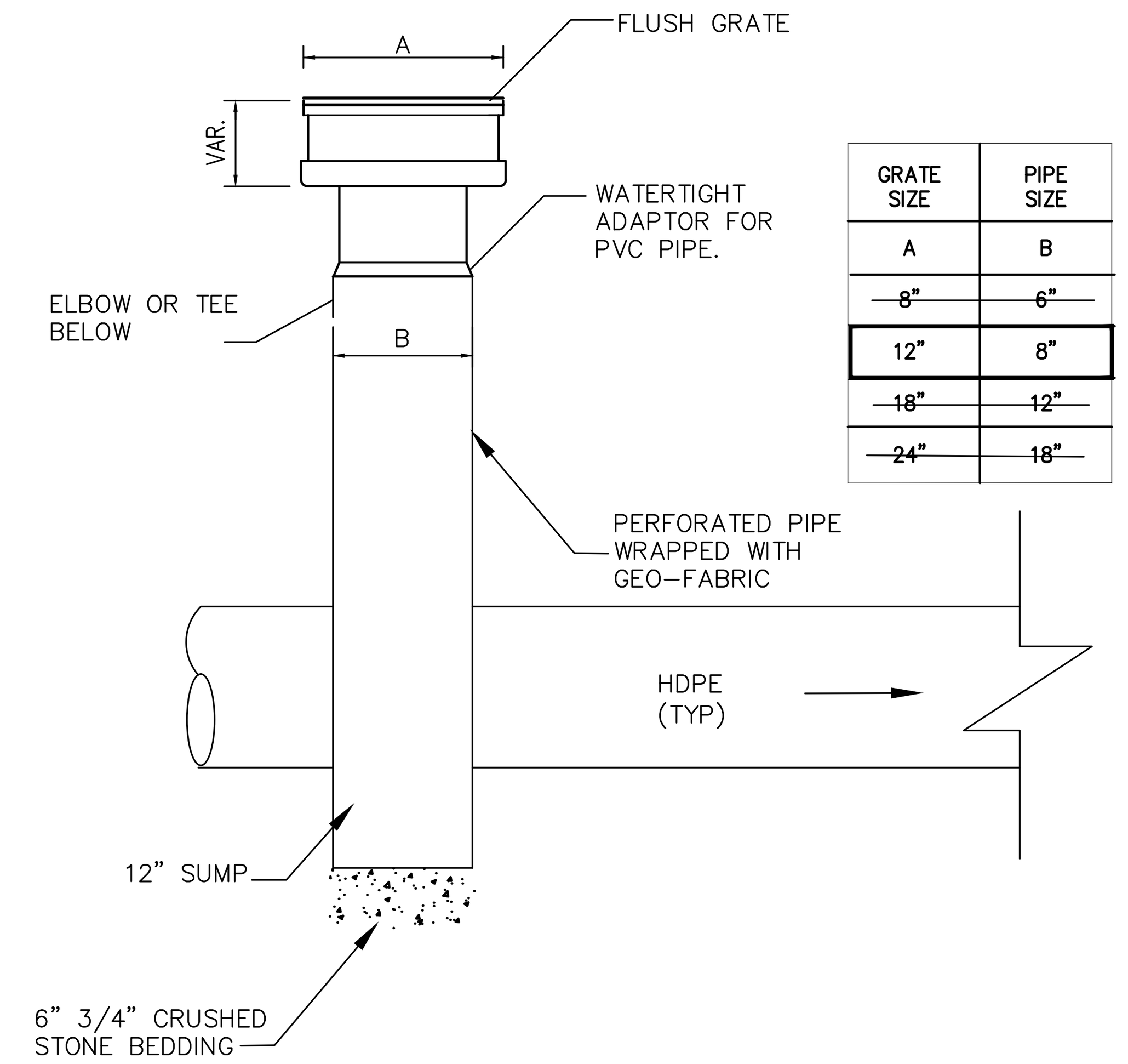
SHEET NUMBER:
C6.0



NOTES:
1. SILTSOXX OR APPROVED EQUAL SHALL BE USED FOR SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.
5. USE TWO ROLLS ADJACENT TO WETLANDS.

SEDIMENT BARRIER DETAIL

NOT TO SCALE



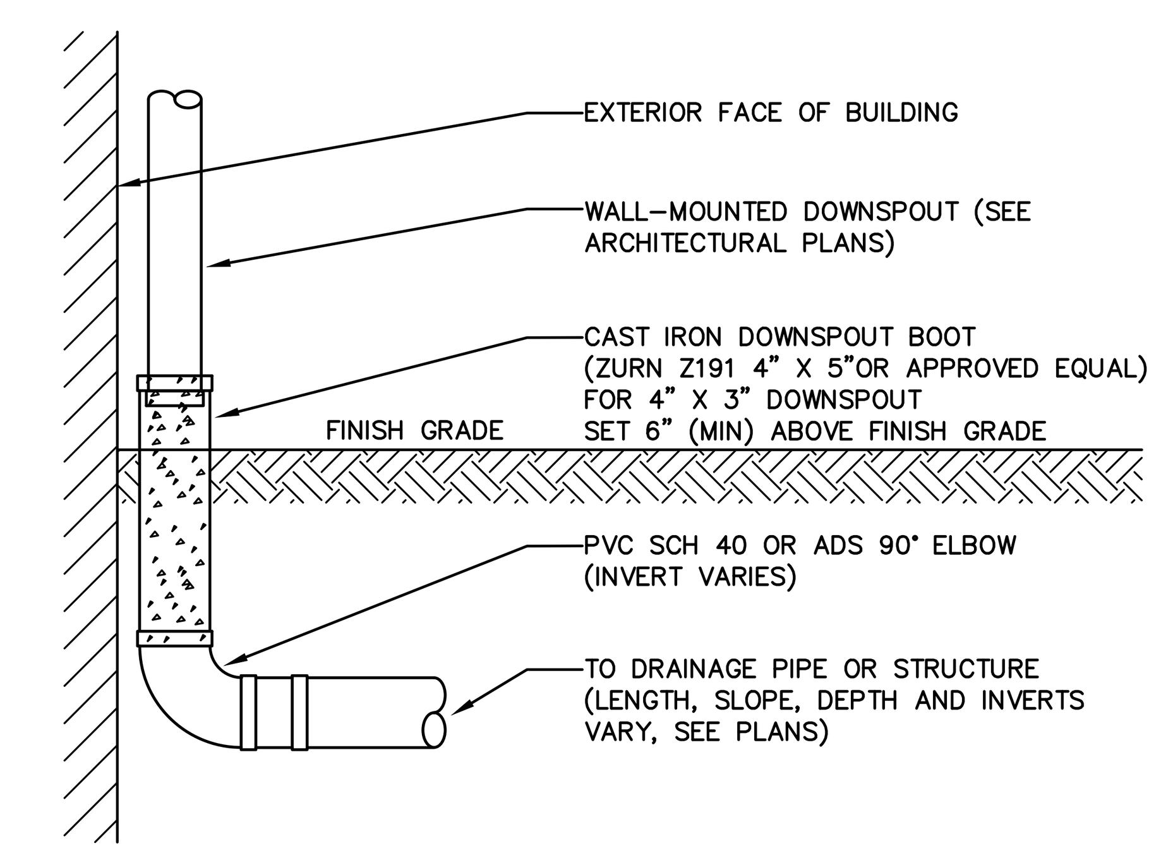
GRATE SIZE	PIPE SIZE
A	B
~~8"~~	~~6"~~
12"	8"
~~18"~~	~~12"~~
~~24"~~	~~18"~~

YARD DRAIN NOTES:

1. INLINE DRAIN TO BE PVC DIAMETER AS SPECIFIED AND AS MANUFACTURED BY ADS 1–800–821–6710 OR APPROVED EQUAL.
2. THE CONTRACTOR SHALL INSTALL THE INLINE DRAIN AS PER THE MANUFACTURER'S RECOMMENDATIONS AND AS SHOWN ON THE DRAWINGS.

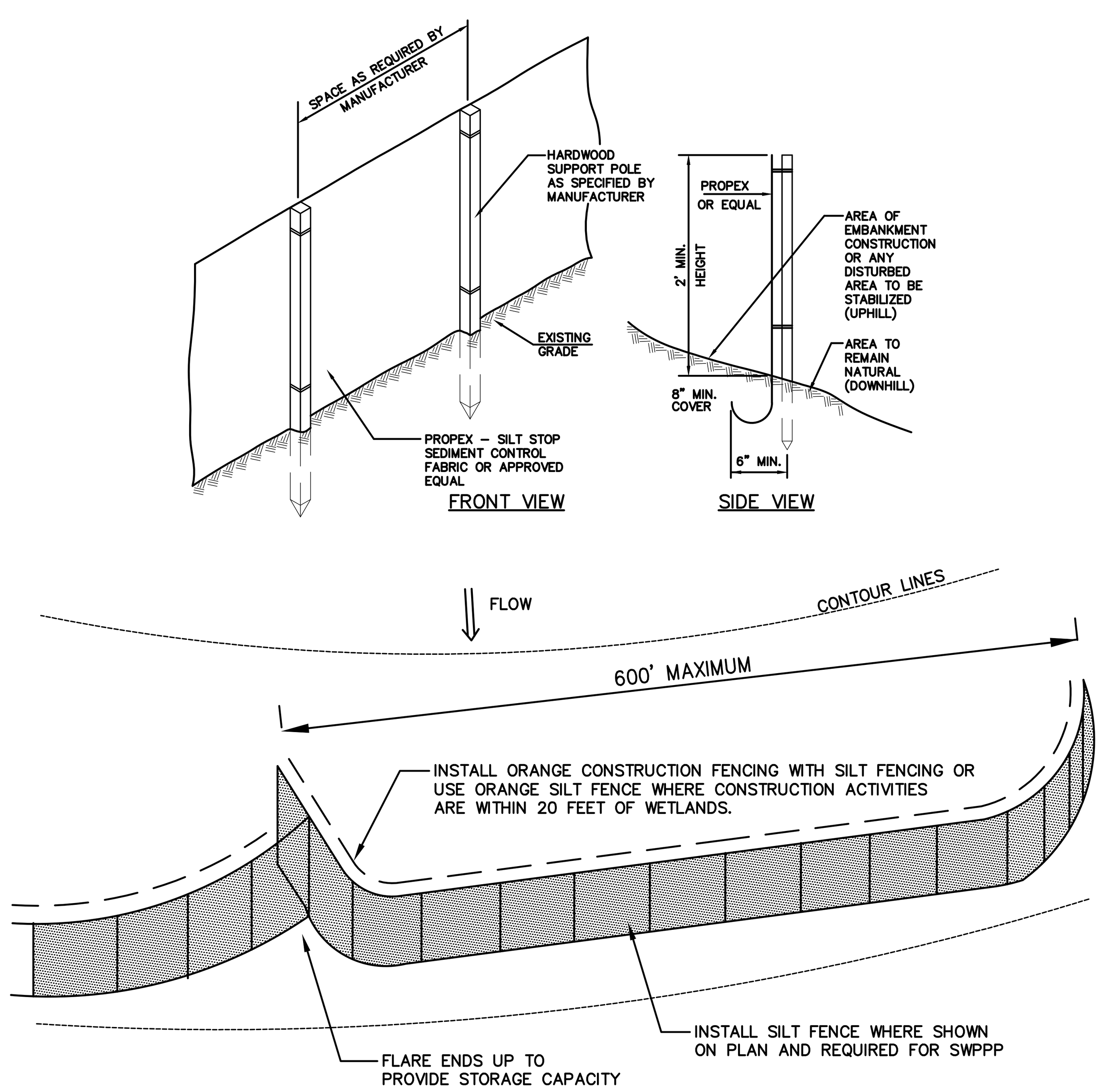
YARD DRAIN AND GRATE DETAIL

NOT TO SCALE



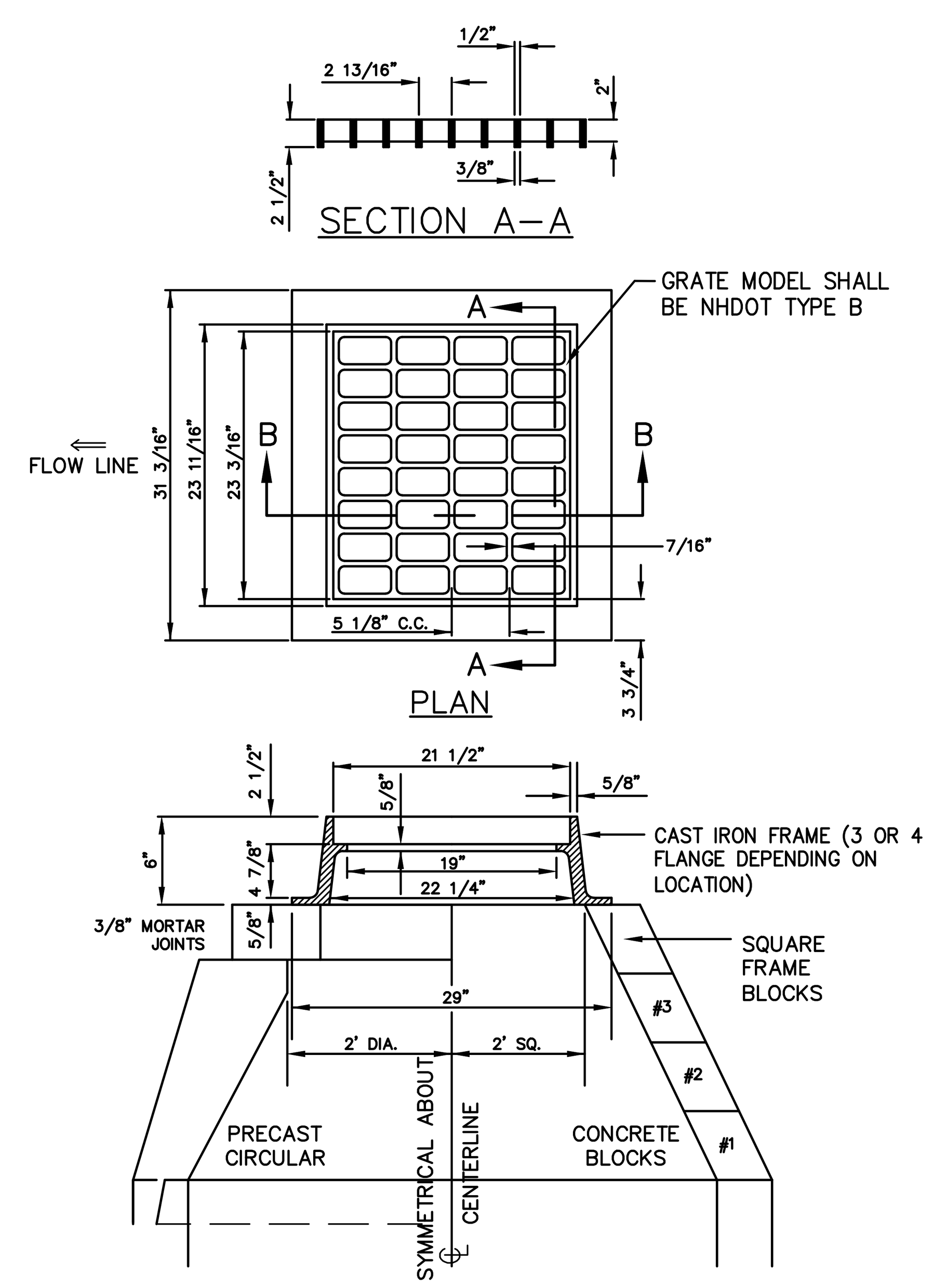
EXTERIOR ROOF DRAIN CONNECTION

NOT TO SCALE

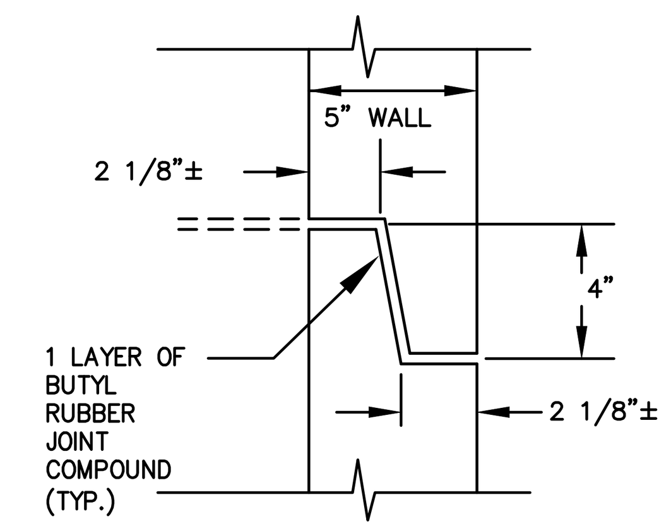


SILT FENCE

NOT TO SCALE



GRATE & FRAME DETAIL

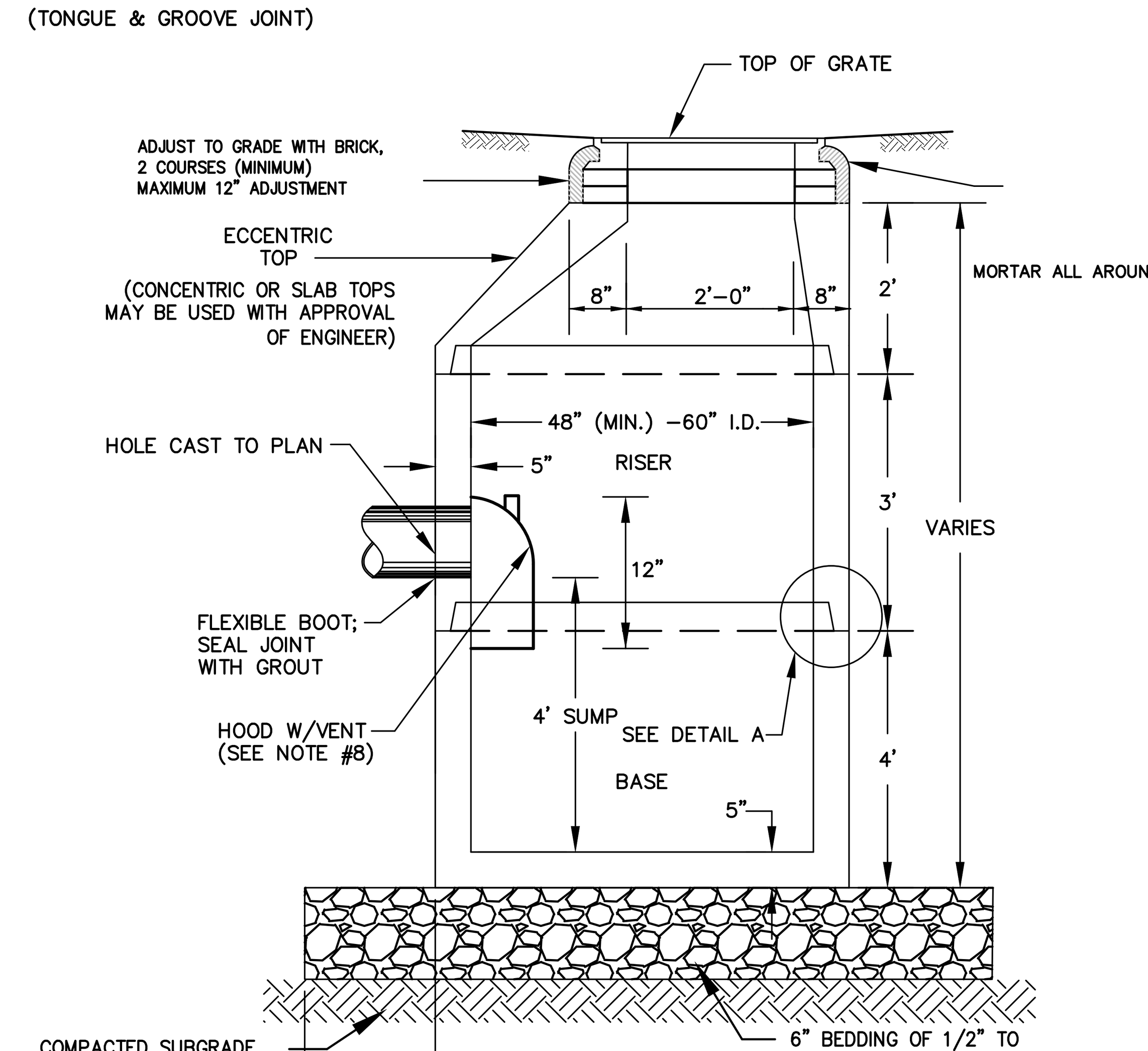


DETAIL A

(TONGUE & GROOVE JOINT)

NOTES

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4' OF FINISH GRADE.
7. FRAME AND GRATE DIMENSIONS ARE TYPICAL BUT MAY VARY BASED ON PRODUCT SELECTED OR EQUIVALENT APPROVED BY THE ENGINEER.
8. OIL/WATER/DEBRIS SEPERATOR HOOD, "THE SNOUT" BY BEST MANAGEMENT PRODUCTS, INC. (WWW.BESTMP.COM) OR APPROVAL EQUAL. INSTALL PER MANUFACTURER'S SPECIFICATIONS.



SECTION A–A

DEEP SUMP CATCH BASIN/DRAIN MANHOLE

NOT TO SCALE

P5146

CASE #22-12

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PROJECT:

PHILLIPS EXETER ACADEMY

WETHERELL, LANGDELL, & MERRILL REPLACEMENT AND RENOVATION PROJECT

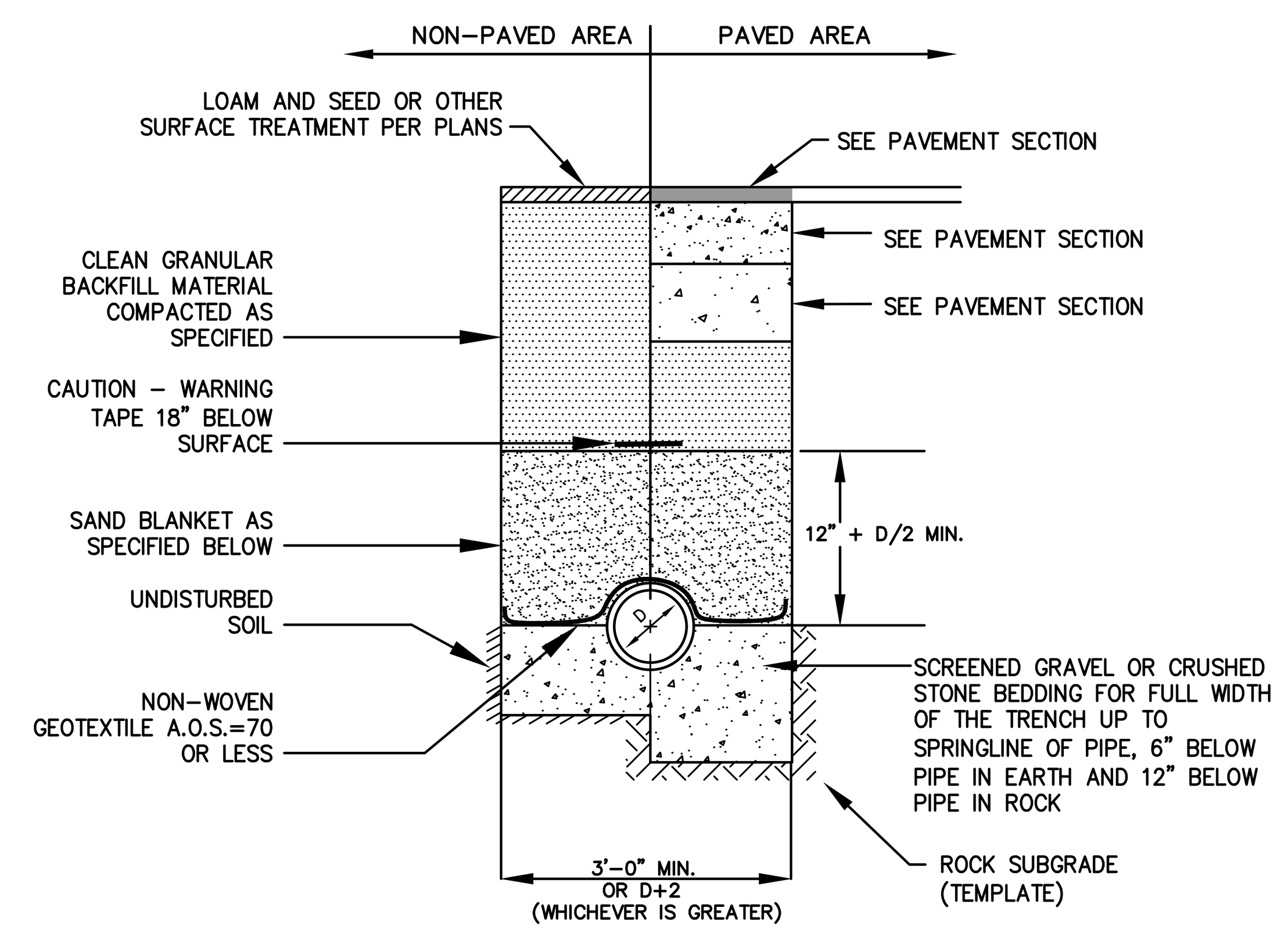
EXETER, NH 03833

TITLE:

DETAILS

SHEET NUMBER:

C6.1



BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

SAND BLANKET/BARRIER

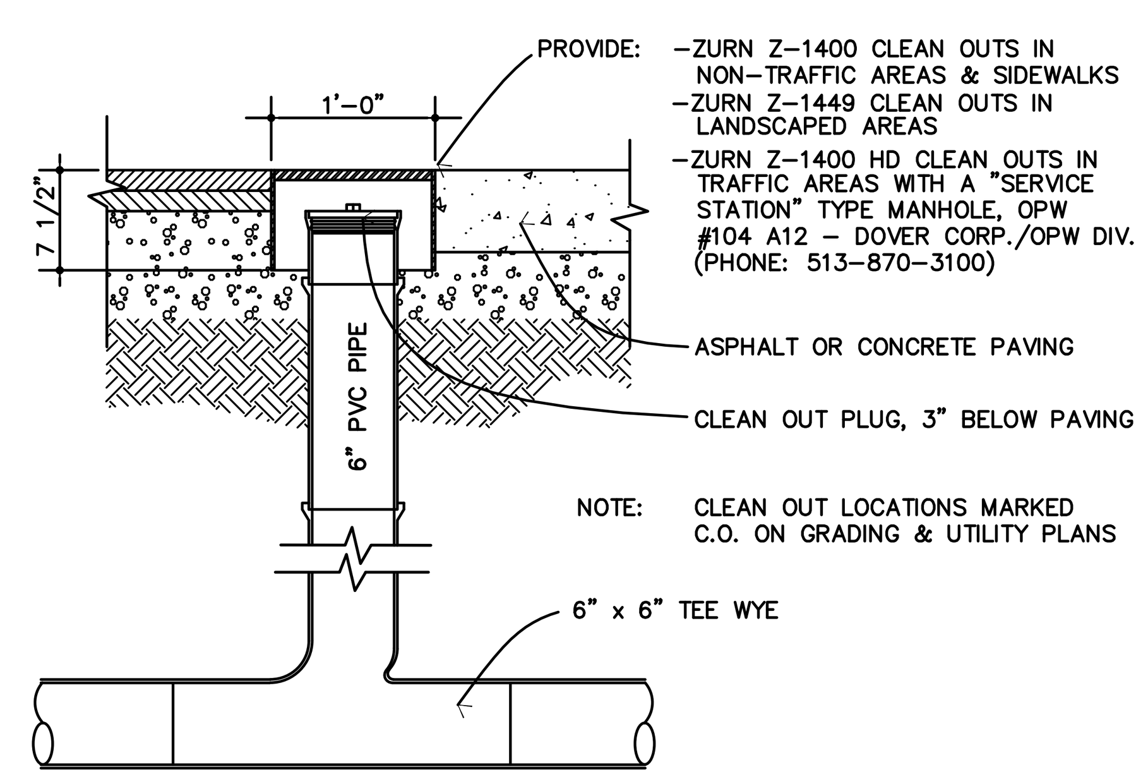
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING

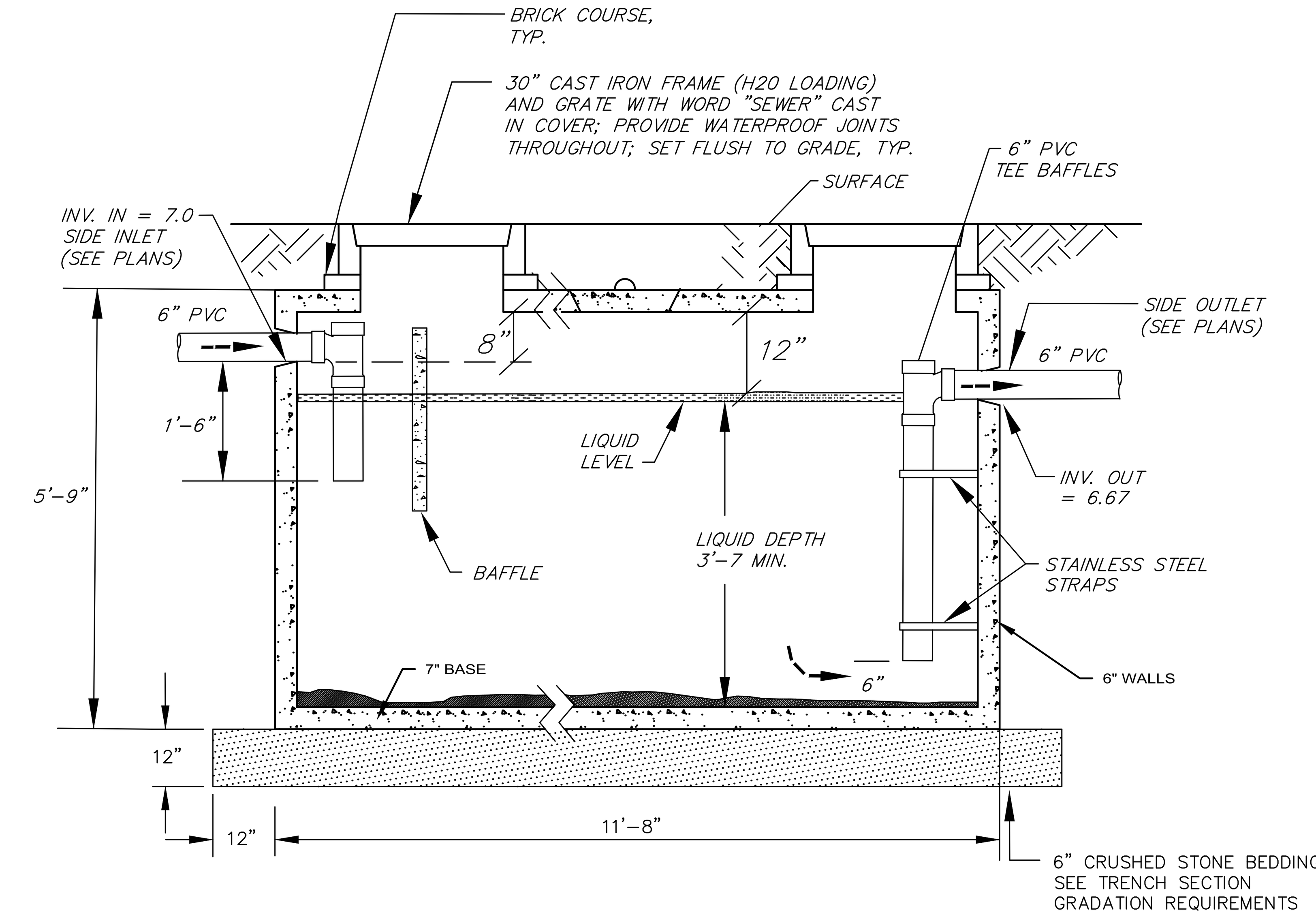
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

STORM DRAIN AND SEWER TRENCH
NOT TO SCALE



SEWER CLEANOUT
NOT TO SCALE

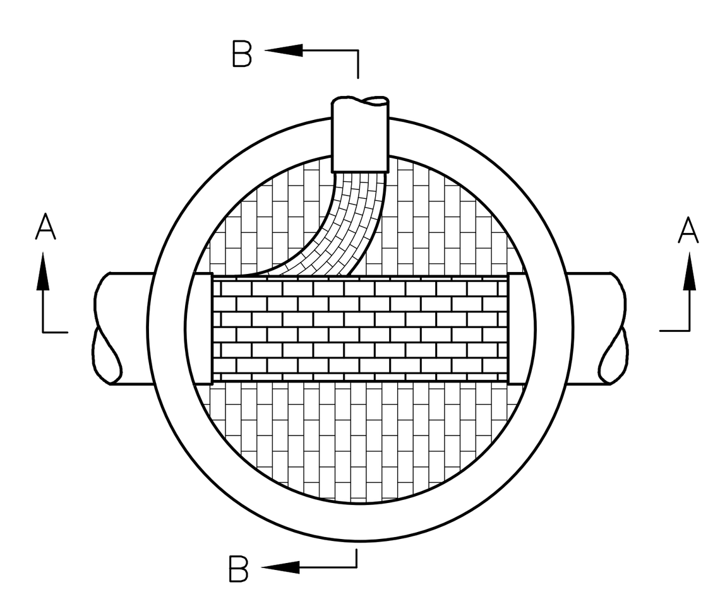


2000 GALLON GREASE (SEPTIC) TANK

NOTES:

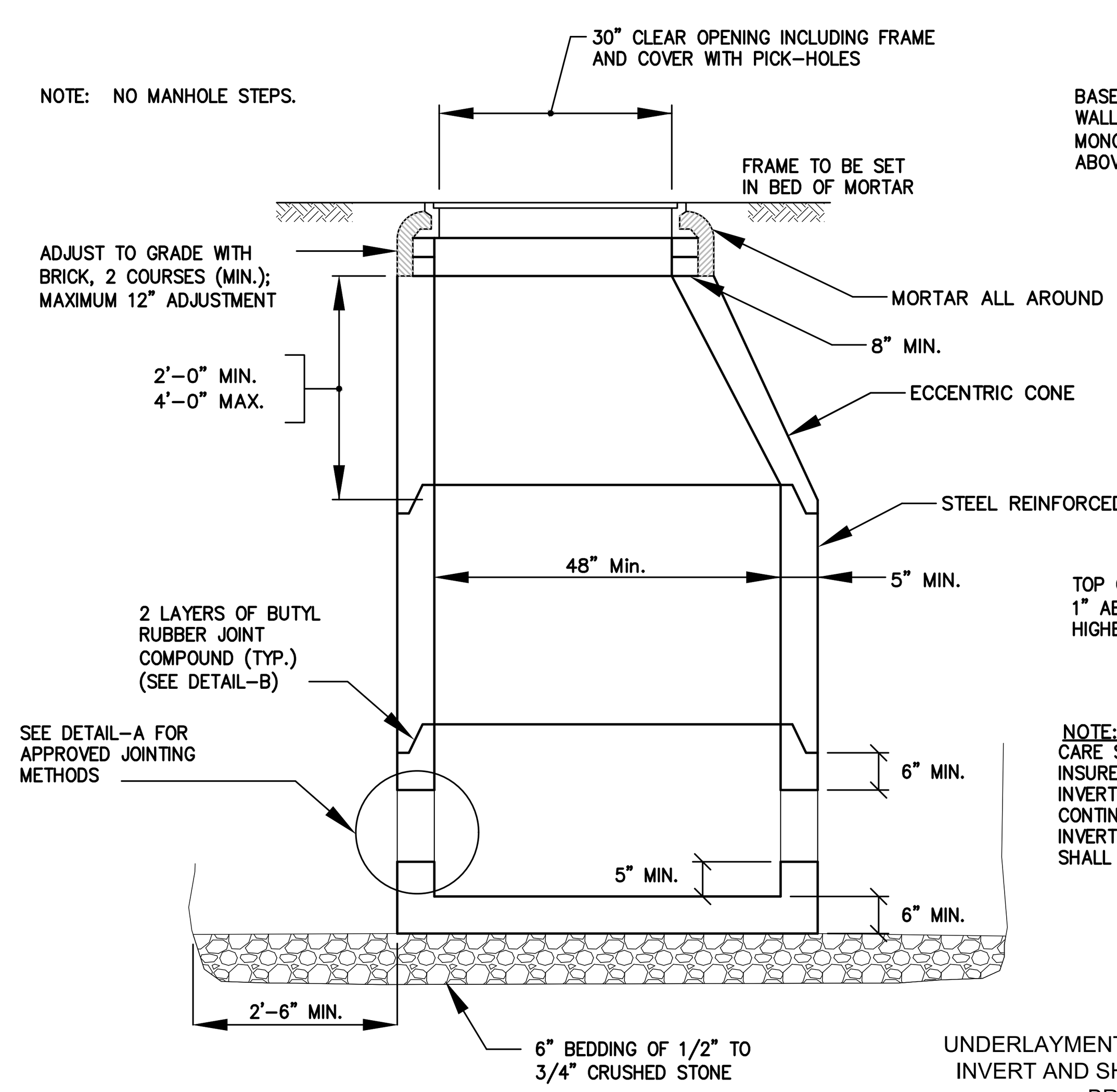
1) 2,000 GAL CONCRETE SEPTIC TANK BY MICHIE OR APPROVED EQUAL. EXTERNAL DIMENSIONS: H = 5'-9, L = 11'-8", W = 8'-4"
2) DESIGN LOAD SHALL BE H-20.
3) SEAL THE OUTSIDE OF THE TANK AND MANHOLE WITH TWO BITUMINOUS COATINGS.
4) SEAL, PRECAST SECTION JOINTS, WITH 1" BUTYL RUBBER OR EQUAL.
5) GREASE TRAP SIZE IS BASED ON 720 TOTAL MEALS SERVED PER DAY. TOWN REQUIREMENT IS 2.5 GALLONS PER PATRON SERVED, WHICH REQUIRES A 1,800 GAL GREASE TRAP.

GREASE TRAP
NOT TO SCALE

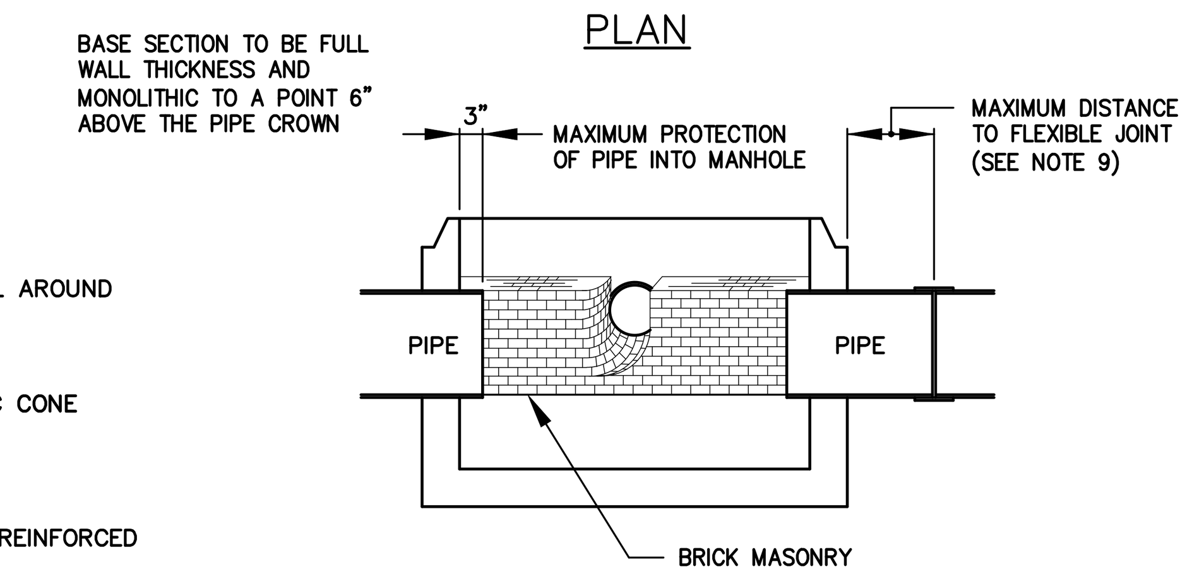


PLAN

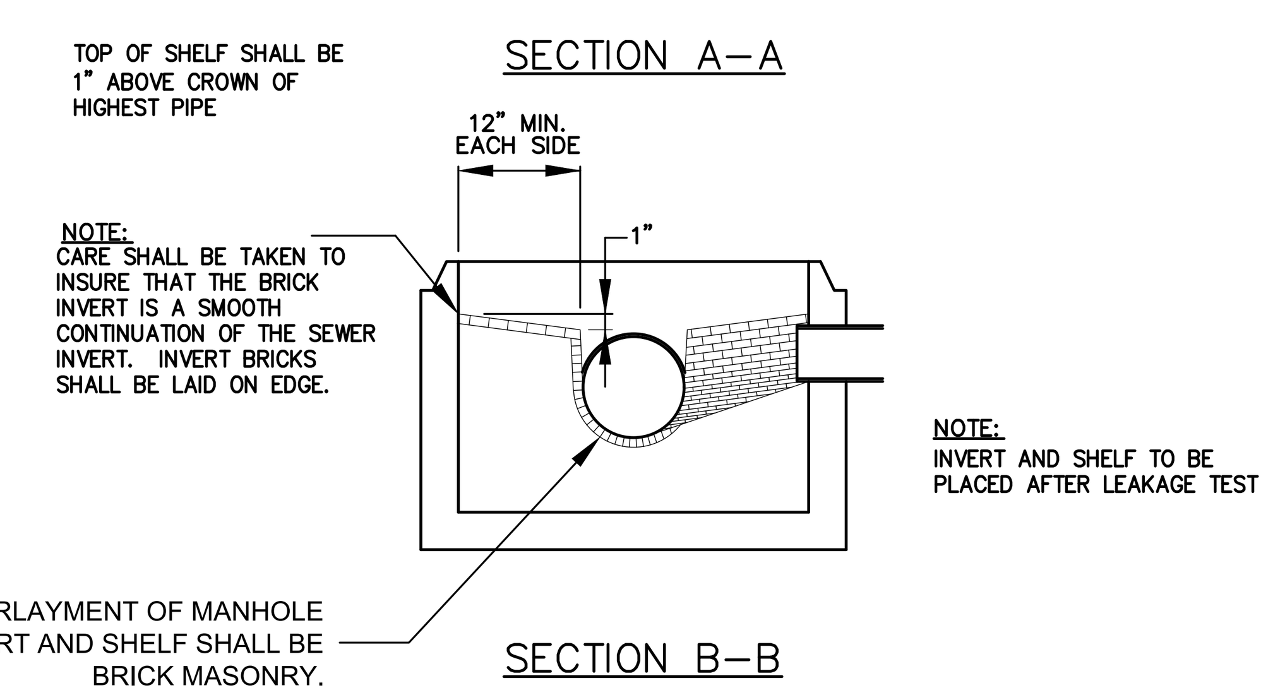
NOTE: NO MANHOLE STEPS.



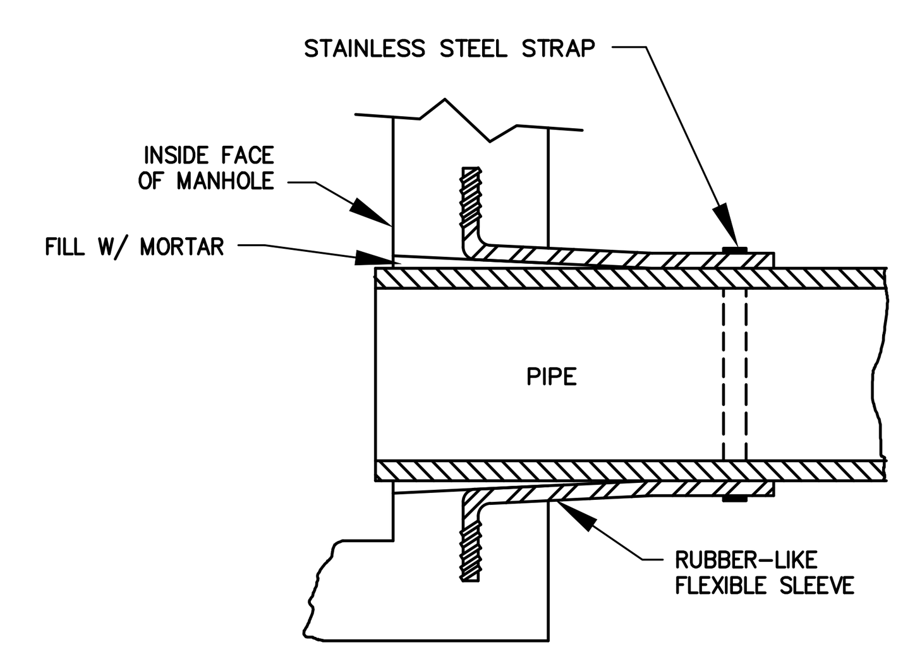
TYPICAL SECTION



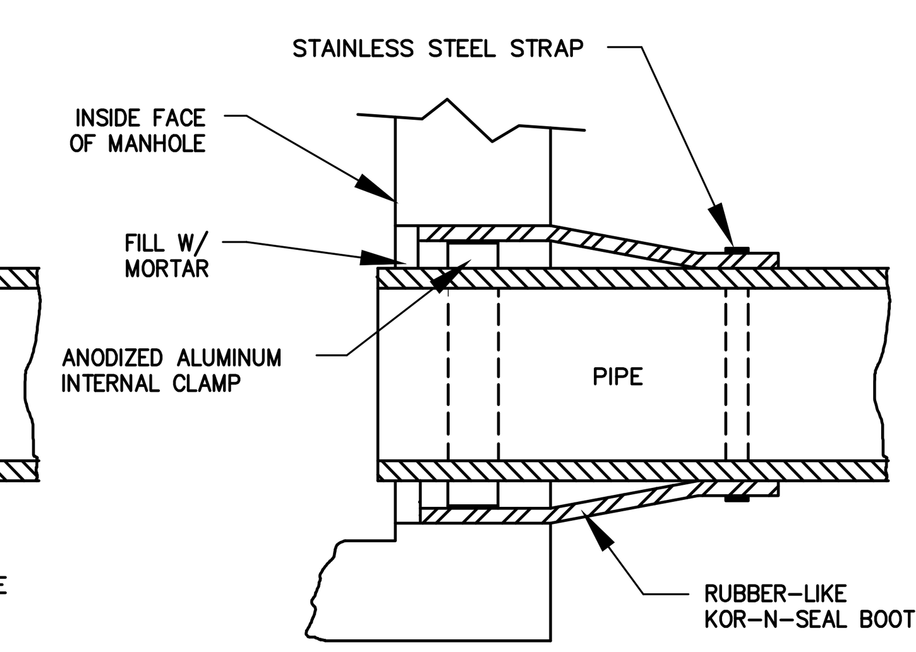
SECTION A-A



SECTION B-B



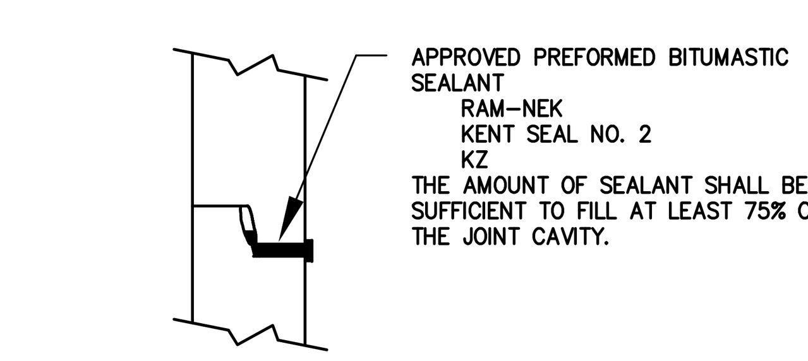
LOCK-JOINT FLEXIBLE MANHOLE SLEEVE
(OR EQUAL)



KOR-N-SEAL JOINT SLEEVE
(OR EQUAL)

NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

DETAIL-A



BITUMASTIC

NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

DETAIL-B
(APPROVED MANHOLE SECTION JOINTING METHODS)

SEWER MANHOLE DETAILS
NOT TO SCALE

P5146

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TOWN OF EXETER PROJECT REFERENCE

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133 Court Street, Portsmouth, NH 03801
(603) 433-2335, www.altus-eng.com

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ARCHITECT:

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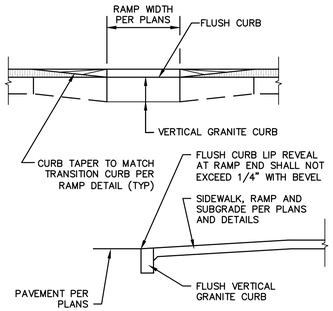
EXETER, NH 03833

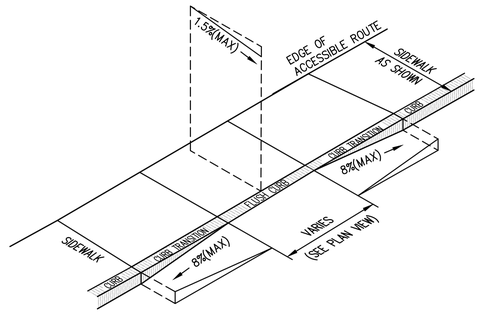
TITLE:
DETAILS

SHEET NUMBER:
C6.2



FLUSH CURB AT DRIVEWAY DETAIL

NOT TO SCALE

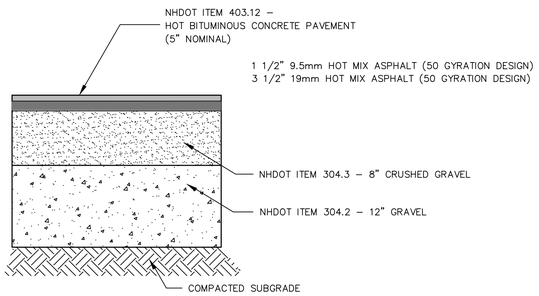


NOTES:

1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 1.5%.
2. THE MAXIMUM ALLOWABLE SLOPE OF AN ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) CURB RAMP SHALL BE 8%.
4. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
5. BASE OF RAMP SHALL BE GRADED TO PREVENT THE PONDING OF WATER.
6. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
7. ALL CURB RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AMERICANS WITH DISABILITIES ACT (ADA) AND ALL APPLICABLE CODES.
8. FLUSH CURB SECTIONS SHALL HAVE A MAXIMUM LIP REVEAL OF 1/2" AT THE EDGE OF PAVEMENT.
9. EDGES OF SIDEWALK FOOTINGS ALONG FLUSH CURBS SHALL BE HAUNCHED SO AS TO EXTEND TO A MINIMUM DEPTH OF 1' BELOW FINISH GRADE.
10. NO SIDEWALK SHALL BE LESS THAN 4' IN WIDTH.

CURB TRANSITION (TYPDOWN)

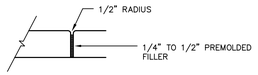
NOT TO SCALE



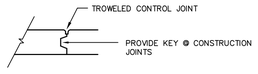
(SEE GEOTECHNICAL RECOMMENDATIONS)

BITUMINOUS CONCRETE PAVEMENT DETAIL

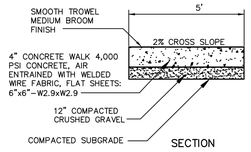
NOT TO SCALE



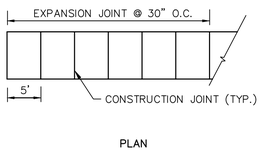
EXPANSION JOINT



CONSTRUCTION/CONTROL JOINT



SECTION



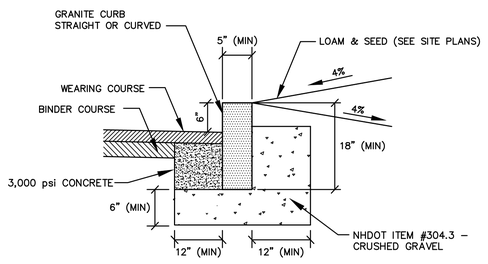
PLAN

CONCRETE SIDEWALK DETAIL

NOT TO SCALE

NOTE: SUBGRADE AREA TO BE PROOF ROLLED
VERIFY WITH GEOTECH

CONCRETE PAVING DETAIL



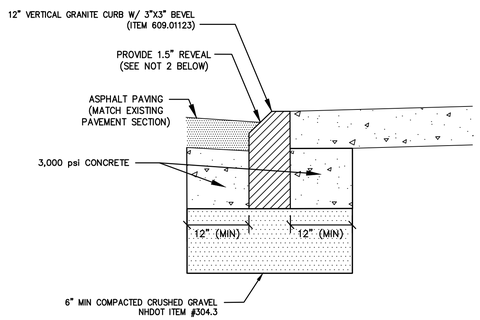
NOTES:

1. SEE PLANS FOR CURB LOCATION.
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF CURB STONES = 3'
4. MAXIMUM LENGTH OF CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES – SEE CHART.
6. CURB ENDS TO ROUNDED AND BATTERED FACES TO BE CUT WHEN CALLED FOR ON THE PLANS.

RADIUS	MAX. LENGTH
21'	3'
22'–28'	4'
29'–35'	5'
36'–42'	6'
43'–49'	7'
50'–56'	8'
57'–60'	9'
OVER 60'	10'

VERTICAL GRANITE CURB

NOT TO SCALE

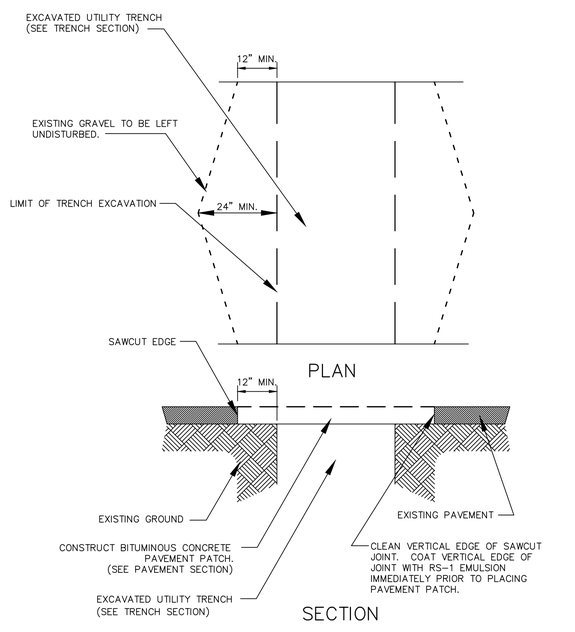


NOTES:

1. SEE VERTICAL GRANITE CURB DETAIL FOR DETAILS NOT SHOWN
2. CONTRACTOR SHALL PROVIDE 1.5" MOUNTABLE CURB REVEAL. NHDOT ITEM 609.01123 WITH 3" BEVEL MAY BE USE AND PAVED TO 1.5" REVEAL OR GRANITE CURB CUT TO PROVIDE 1.5" BEVEL.

MOUNTABLE GRANITE CURB

NOT TO SCALE



TYPICAL PAVEMENT SAWCUT DETAIL

NOT TO SCALE

NOTES

1. MACHINE CUT EXISTING PAVEMENT.
2. ALL TEMPORARY, DAMAGED OR DEFECTIVE PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF PERMANENT TRENCH REPAIRS.
3. DIAMOND PATCHES, SHALL BE REQUIRED FOR ALL TRENCHES CROSSING ROADWAY. DIAMOND PATCHES SHALL MEET NHDOT REQUIREMENTS.

TYPICAL TRENCH PATCH

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DRAWN BY: CDB
APPROVED BY:
DRAWING FILE: 5146_DTLS.DWG

SCALE: (24"x36") 1"=20'

OWNER/APPLICANT:

Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:

PHILLIPS EXETER ACADEMY

WETHERELL, LANGDELL, & MERRILL REPLACEMENT AND RENOVATION PROJECT

EXETER, NH 03833

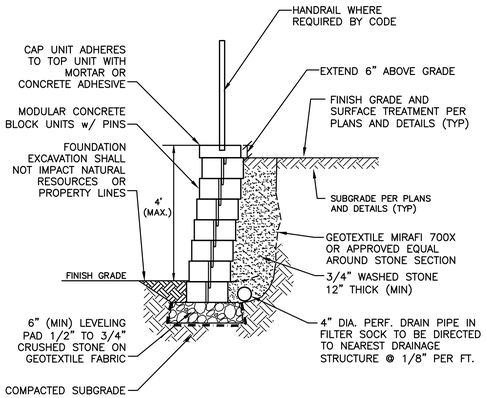
TITLE:

DETAILS

SHEET NUMBER:

C6.3

P5146

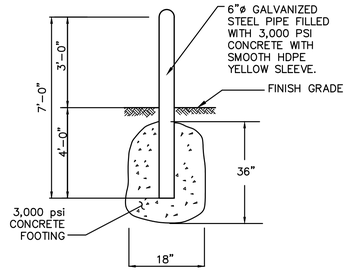


NOTES:

1. TYPICAL MODULAR BLOCK SHALL BE PRECAST CONCRETE MEASURING APPROXIMATELY 16"x12"x6". OTHER BLOCK SIZES MAY BE APPROVED BY THE ENGINEER UPON REQUEST. CAP UNITS SHALL BE PER THE STANDARDS OF THE SELECTED MANUFACTURER.
2. BLOCK MANUFACTURER SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
3. WALL SHALL BE INSTALLED PER THE REQUIREMENTS OF THE MANUFACTURER.
4. WALL HEIGHT SHALL NOT EXCEED 4' WITHOUT DESIGN DRAWINGS STAMPED BY A PROFESSIONAL STRUCTURAL ENGINEER.
5. LOCKING PINS MAY OR MAY NOT BE REQUIRED BASED ON THE WALL MANUFACTURER APPROVED BY THE ENGINEER.
6. WALL SHALL BE EMBEDDED BELOW EXISTING GRADE THE DEPTH OF AT LEAST ONE BLOCK UNLESS OTHERWISE SPECIFIED BY THE WALL MANUFACTURER.
7. WALL BATTER SHALL BE PER THE MANUFACTURER'S SPECIFICATIONS.
8. BLOCK FINISH SHALL BE AT THE DISCRETION OF THE OWNER.
9. MODULAR BLOCK RETAINING WALL SHALL BE VERSA-LOK RETAINING WALL SYSTEMS (OR APPROVED EQUAL).

SMALL BLOCK GRAVITY RETAINING WALL

NOT TO SCALE



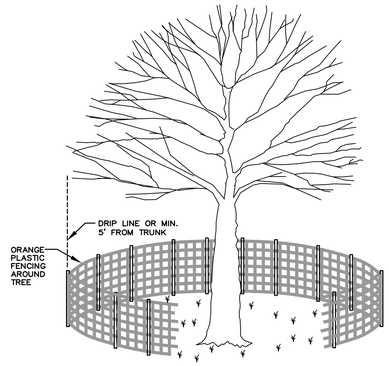
BOLLARD

NOT TO SCALE

NOTE:
IF SOIL BECOMES COMPATCED OVER THE ROOT ZONE OF ANY TREE, THE GROUND SHOULD BE AERATED BY PUNCHING SMALL HOLES IN IT WITH SUITABLE AERATING EQUIPMENT.

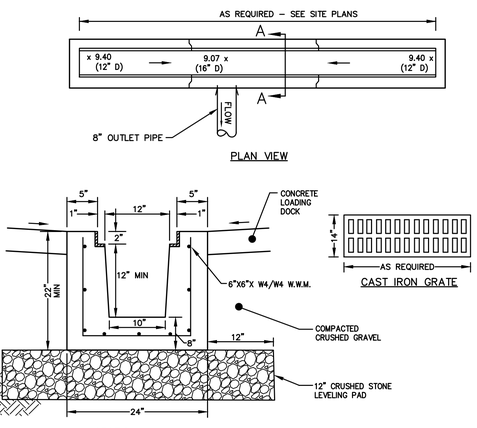
ANY DAMAGE TO THE CROWN, TRUNK OR ROOT SYSTEM OF ANY TREE RETAINED ON SITE SHOULD BE REPAIRED IMMEDIATELY. CONSULT A FORESTER OR TREE SPECIALIST FOR MORE SERIOUS DAMAGE OF TREES.

CONTRACTOR TO USE TREE PROTECTION WHERE SUITABLE AND/OR AS DIRECTED BY THE ENGINEER.



TREE PROTECTION DETAILS

NOT TO SCALE

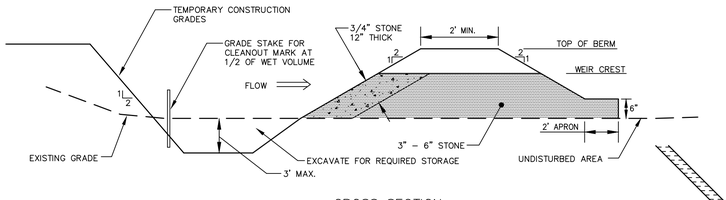


NOTES

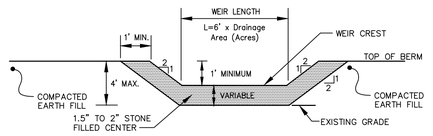
1. MINIMUM 4,000 PSI CONCRETE @ 28 DAYS
2. TO BE SUPPLIED BY PRECAST CONCRETE SALES CO., 123 ROUTE 303 VALLEY COTTAGE, NY 10989 (845) 268-4949 OR APPROVED EQUAL

TRENCH DRAIN

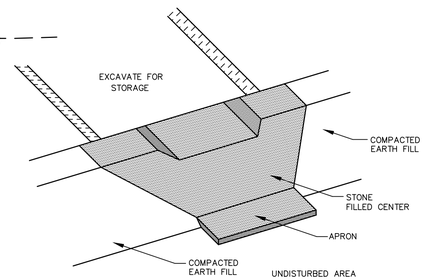
NOT TO SCALE



CROSS SECTION



PROFILE



ISOMETRIC VIEW

MAINTENANCE

1. SEDIMENT SHALL BE REMOVED AND THE TRAP SHALL BE RESTORED TO ITS ORIGINAL CAPACITY WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN STORAGE VOLUME. SEDIMENT REMOVED SHALL BE DISPOSED OF SO THAT IT DOES NOT CAUSE A SEDIMENT PROBLEM AT ANOTHER LOCATION.
2. THE STRUCTURE SHALL BE CHECKED BI-WEEKLY AND AFTER EVERY MAJOR STORM TO INSURE THAT IT IS WORKING PROPERLY AND IS NOT DAMAGED. DAMAGE TO THE STRUCTURE SHALL BE REPAIRED IMMEDIATELY.
3. 3/4" STONE SHALL BE CHECKED DURING INSPECTION AND REPLACED WHEN THE OPENINGS IN THE STONE HAVE BECOME CLOGGED.
4. WHEN THE DRAINAGE AREA FLOWING INTO THE BASIN HAS BEEN FULLY STABILIZED, THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA VEGETATED USING LOAM AND SEED WITH MULCH (OR SOD IF NECESSARY) WITHIN 72 HOURS OF THE REMOVAL OF THE BASIN.

TEMPORARY SEDIMENT TRAP (TST) OUTLET

NOT TO SCALE

CASE #22-12

TOWN OF EXETER PROJECT REFERENCE

ENGINEER:

ALTUS ENGINEERING, INC.

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – CORY D. BELDEN No. 14239 LICENSED PROFESSIONAL ENGINEER – 8/29/22

ARCHITECT:

ROBERT A.M. STERN ARCHITECTS, LLP.

ONE PARK AVENUE, NEW YORK, NEW YORK 10016
TEL (212) 967-5100 FAX (212) 967-5588

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:

PLANNING BOARD APPROVAL

ISSUE DATE:

AUGUST 29, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
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DRAWN BY: CDB
APPROVED BY:
DRAWING FILE: 5146_DTLS.DWG

SCALE: (24"x36") 1"=20'

OWNER/APPLICANT:

PHILLIP EXONIENSIS ACADEMIA – XAPITI GEOT – FINIS ORIGINE PENDET – NOV HAN 1781

Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:

PHILLIPS EXETER ACADEMY

WETHERELL, LANGDELL, & MERRILL REPLACEMENT AND RENOVATION PROJECT

EXETER, NH 03833

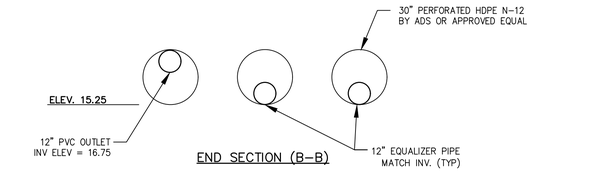
TITLE:

DETAILS

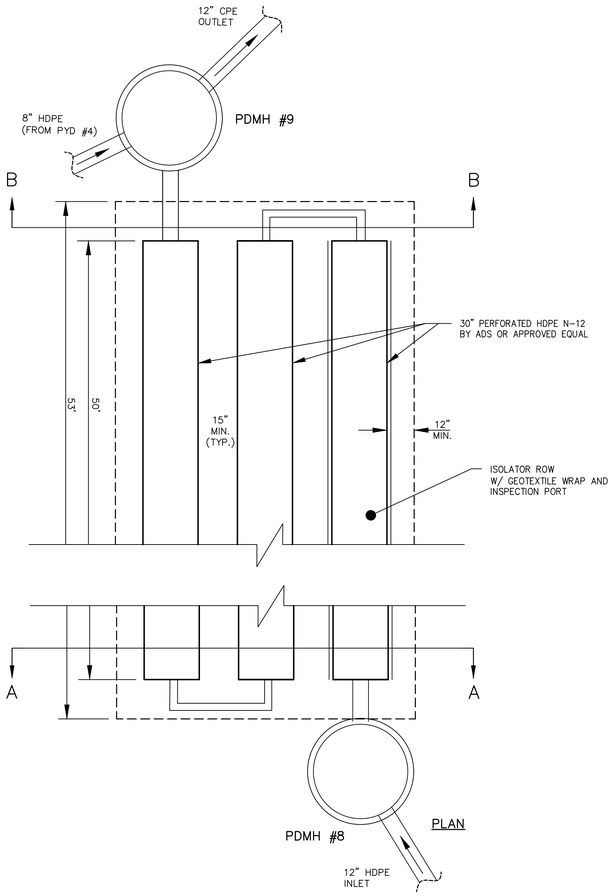
SHEET NUMBER:

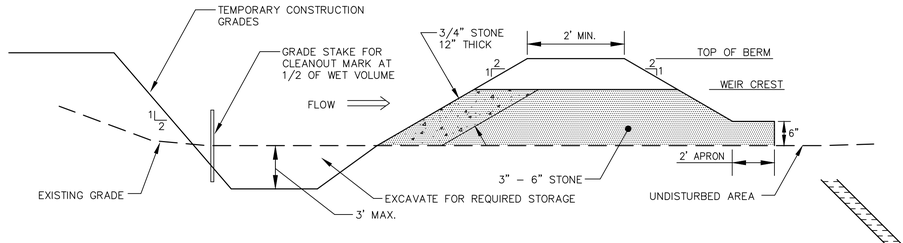
C6.4

P5146

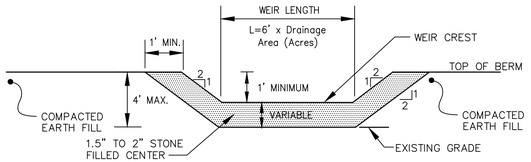


END SECTION (B-B)

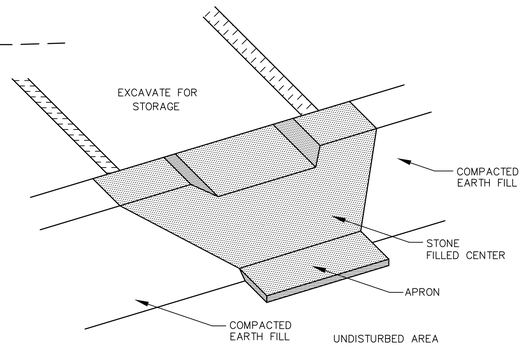




CROSS SECTION



PROFILE



ISOMETRIC VIEW

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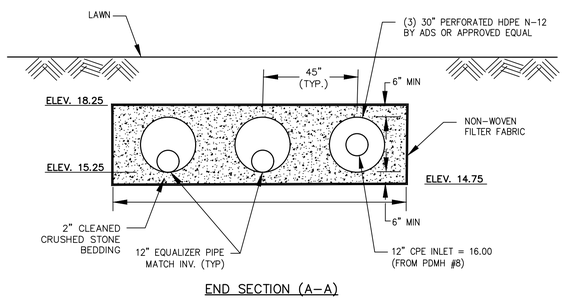
TEMPORARY SEDIMENT TRAP (TST) OUTLET

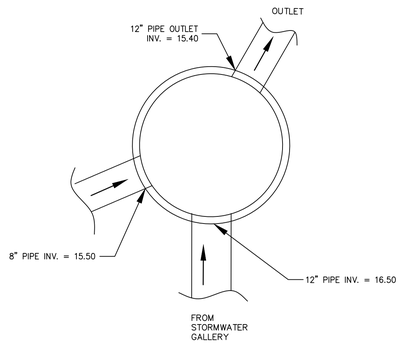
NOT TO SCALE



END SECTION (A-A)

STORMWATER MANAGEMENT GALLERY

NOT TO SCALE



PDMH #9 OUTLET CONTROL STRUCTURE

NOT TO SCALE

CASE #22-12

TOWN OF EXETER PROJECT REFERENCE

ENGINEER:

ALTUS ENGINEERING, INC.

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE
CORY D. BELDEN
No. 14239
LICENSED PROFESSIONAL ENGINEER
8/29/22

ARCHITECT:

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ISSUED FOR:

PLANNING BOARD APPROVAL

ISSUE DATE:

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REVISIONS

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DRAWN BY: CDB

APPROVED BY:

DRAWING FILE: 5146SITE.DWG

SCALE: (24"x36") 1"=20'

OWNER/APPLICANT:

SIGILL PHILLIP EXONIENSIS ACADEMIAE NOV HAN 1781 XAPITI GEOT FINIS ORIGINE PENDET

Phillips Exeter Academy
20 Main Street
Exeter, NH 03833

PROJECT:

PHILLIPS EXETER ACADEMY

WETHERELL, LANGDELL, & MERRILL REPLACEMENT AND RENOVATION PROJECT

EXETER, NH 03833

TITLE:

DETAILS

SHEET NUMBER:

C6.5

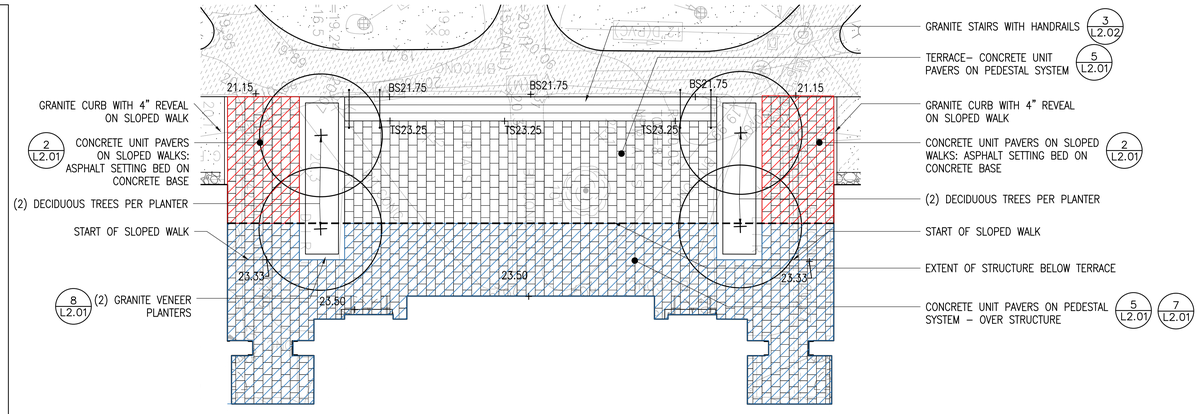
P5146

LEGEND

- LOAM AND SEED — 5 / L2.03
- PLANTING BED: SHRUBS, PERENNIALS, BULBS
- DECIDUOUS TREE — 2 / L2.03
- ① IRRIGATED AREA
- IRRIGATION SLEEVE — 7 / L2.03

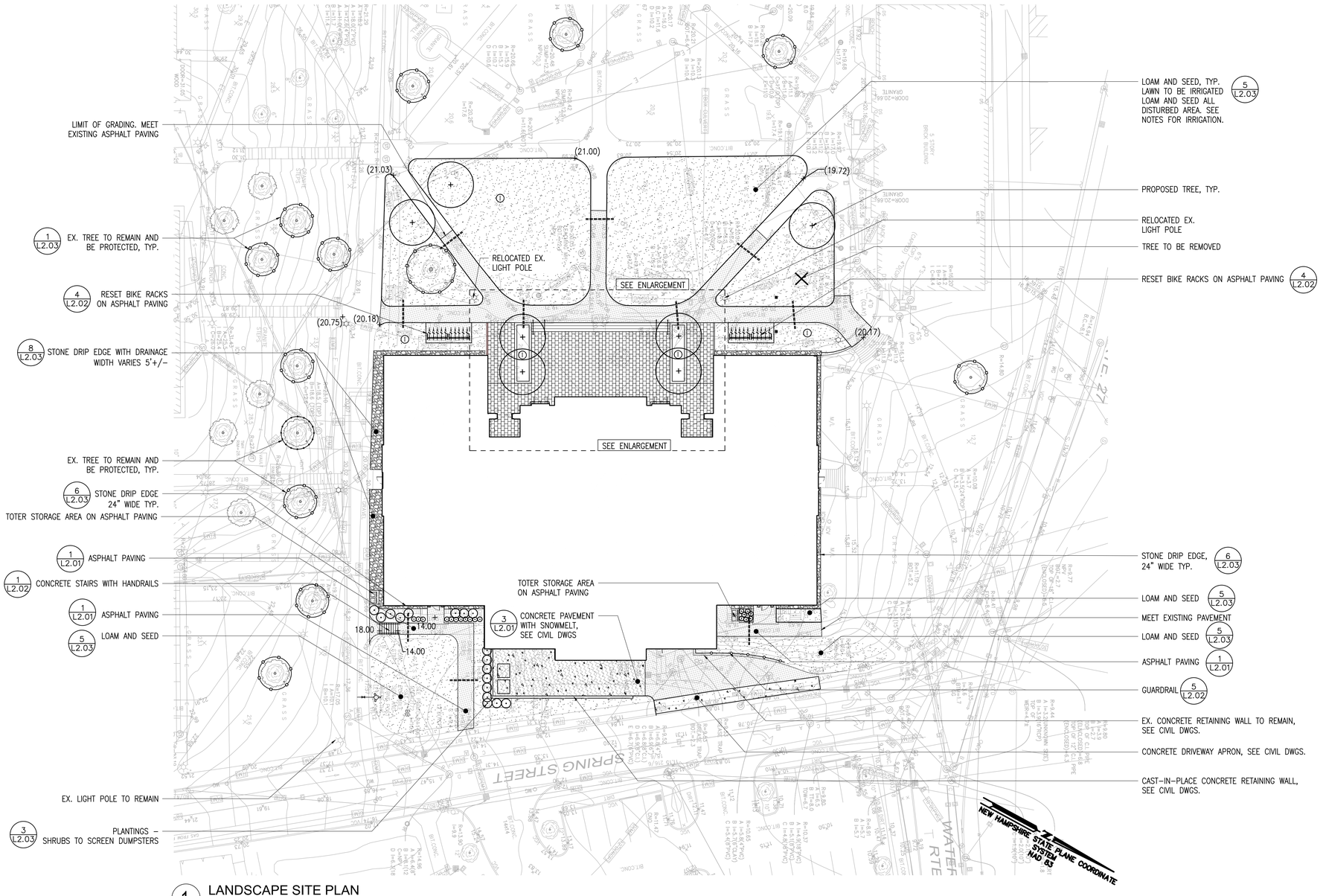
NOTES:
- TREE SIZE= 4" CALIPER
- SHRUBS ARE 30" HEIGHT
- SHRUBS TO BE SPACED 4' O.C.
- PERENNIALS ARE 1 GALLON
- PERENNIALS TO BE SPACED 2' O.C.

- IRRIGATION EXISTS ON SITE: CONTRACTOR SHALL CUT AND CAP THE EXISTING IRRIGATION THAT WILL BE IMPACTED BY CONSTRUCTION, BUT KEEP THE REMAINDER OF THE SYSTEM FUNCTIONAL.



2 TERRACE ENLARGEMENT

SCALE: 1"=10'-0"



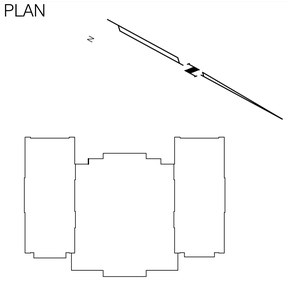
1 LANDSCAPE SITE PLAN

SCALE: 1"=20'-0"

LEGEND / NOTES

CASE #22-12

KEY PLAN



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No.	ISSUE	DATE
4	100% DESIGN DEVELOPMENT	03/09/22
3	SCHEMATIC DESIGN PRICING	01/26/22
2	SCHEMATIC DESIGN PRICING	01/07/22
1	SCHEMATIC DESIGN PRICING	08/20/21

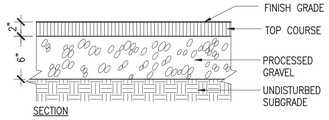
PHILLIPS EXETER ACADEMY
WETHERELL, LANGDELL, MERRILL
RENOVATION AND REPLACEMENT
EXETER, NEW HAMPSHIRE

ROBERT A.M. STERN ARCHITECTS, LLP
ONE PARK AVENUE, NEW YORK, NY 10016
TEL (212) 967-5100 | FAX (212) 967-5588

kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202 617 451-1018 Tel
Boston, MA 02108 www.kylezick.com

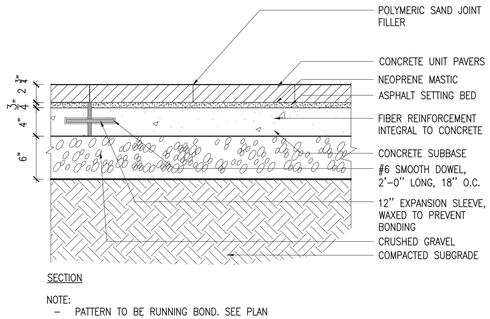
LANDSCAPE PLAN

PROJECT NO: A21010
CAD FILE NO: XR-SITE L1.01.DWG
DRAWING NO: L1.01



1 ASPHALT PAVING - PEDESTRIAN PATH

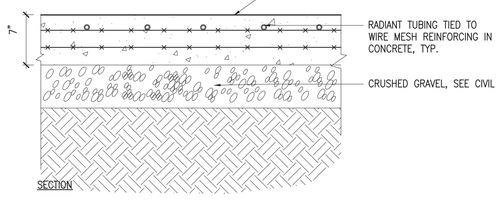
SCALE: 1 1/2" = 1'–0"



NOTE:
– PATTERN TO BE RUNNING BOND. SEE PLAN

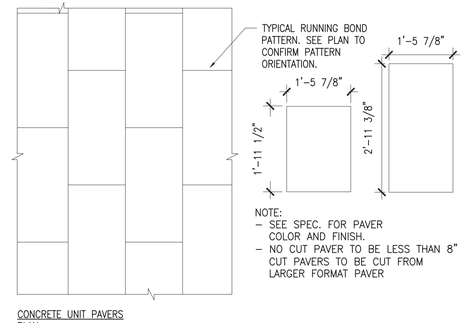
2 CONCRETE UNIT PAVERS - ON CONCRETE

SCALE: 1 1/2" = 1'–0"



3 CONCRETE PAVEMENT - WITH SNOWMELT

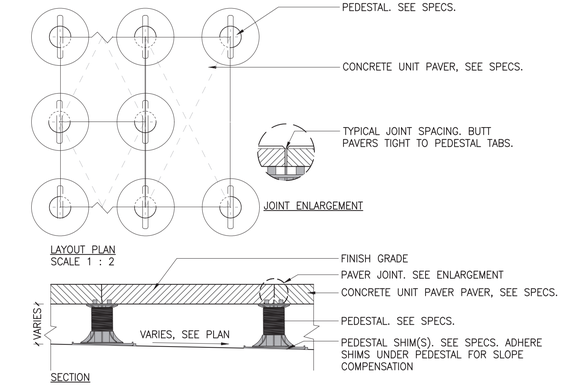
SCALE: 1 1/2" = 1'–0"



NOTE:
– SEE SPEC. FOR PAVER COLOR AND FINISH.
– NO CUT PAVER TO BE LESS THAN 8" CUT PAVERS TO BE CUT FROM LARGER FORMAT PAVER

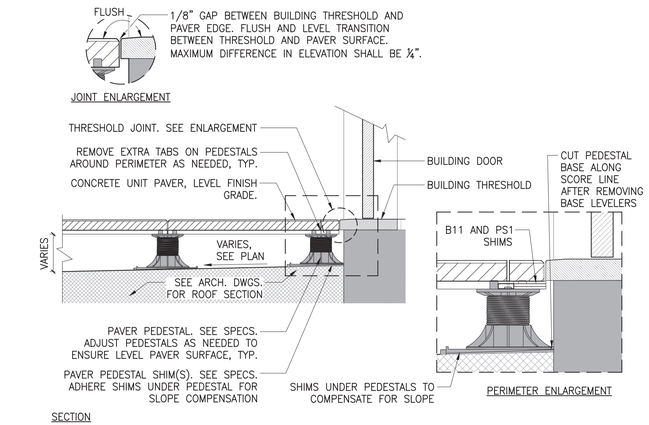
4 CONCRETE UNIT PAVERS - PAVING PLAN

SCALE: 3/4" = 1'–0"



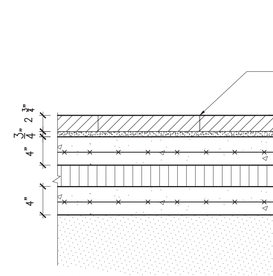
5 CONCRETE UNIT PAVERS - ON PEDESTALS

SCALE: 1 1/2" = 1'–0"



6 CONCRETE UNIT PAVERS - ON PEDESTALS ADJACENT TO BUILDING

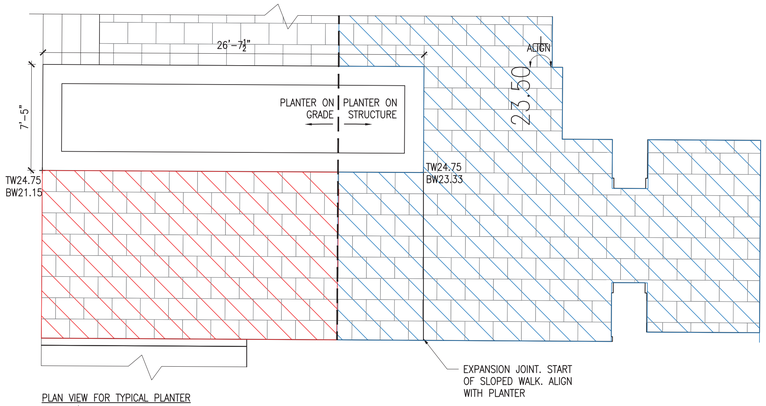
SCALE: 1 1/2" = 1'–0"

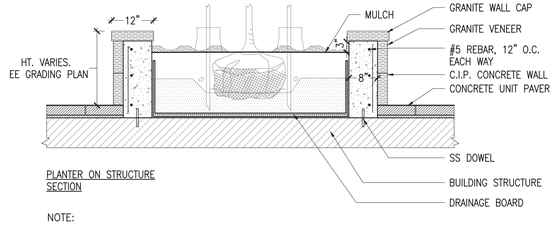


NOTE:
– PATTERN TO BE RUNNING BOND. SEE PLAN

7 CONCRETE UNIT PAVERS - ON STRUCTURE

SCALE: 1 1/2" = 1'–0"

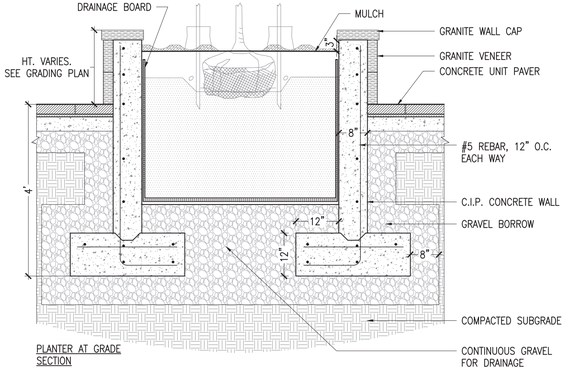




NOTE:
– GRANITE VENEER AND CAP: WOODBURY GRANITE WITH THERMAL FINISH ALL FACES.

8 GRANITE VENEER PLANTER

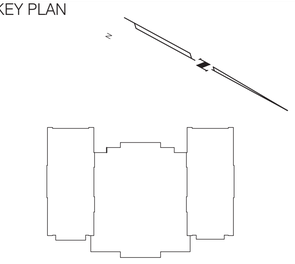
SCALE: 3/4" = 1'–0"



LEGEND / NOTES

CASE #22-12

KEY PLAN



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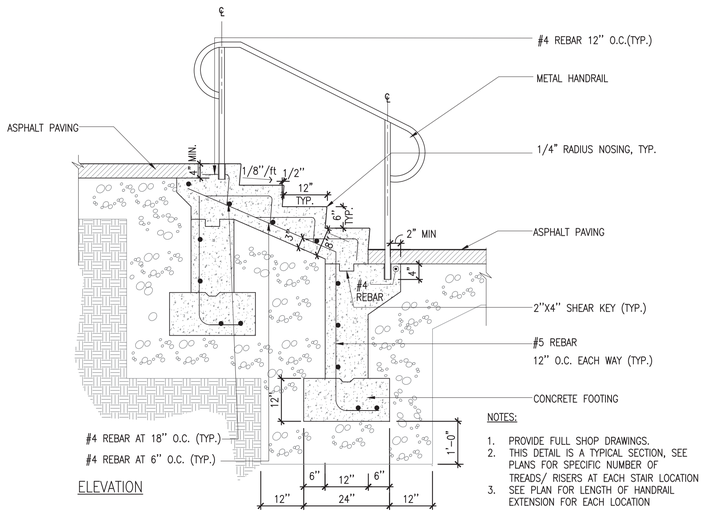
kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202 617 451-1018 Tel
Boston, MA 02108 www.kylezick.com

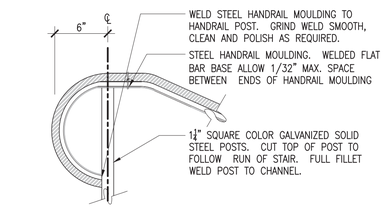
LANDSCAPE DETAILS

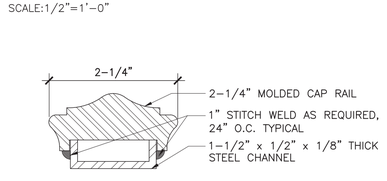
PROJECT NO: A21010
CAD FILE NO: XR-DETAILS.DWG
DRAWING NO: L2.01



1 CONCRETE STAIRS

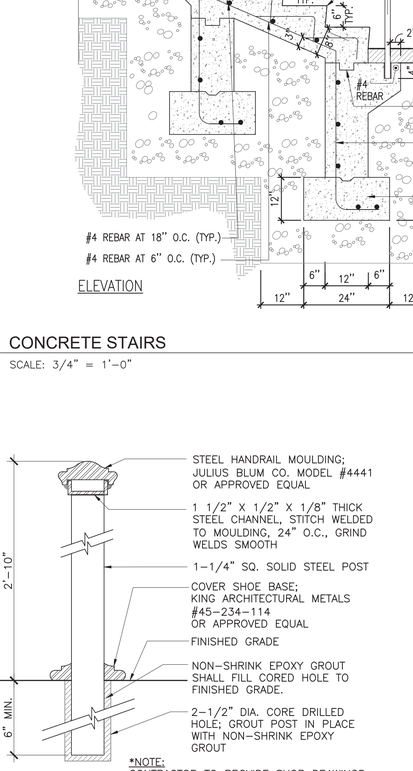
SCALE: 3/4" = 1'-0"

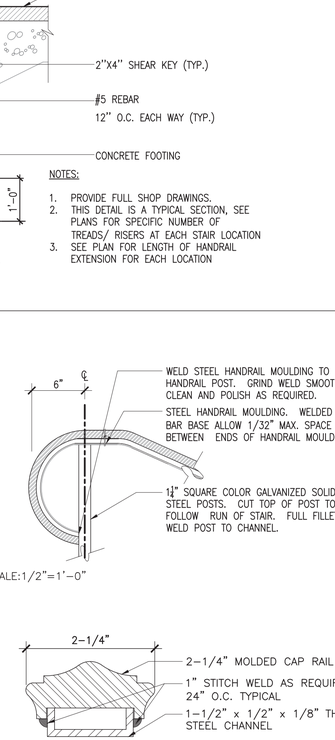


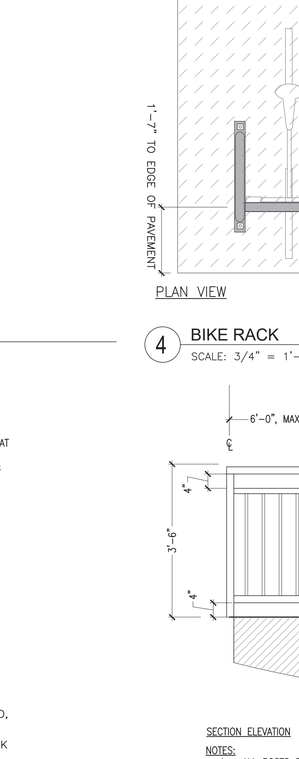


2 HANDRAIL

SCALE:1/2"=1'-0"





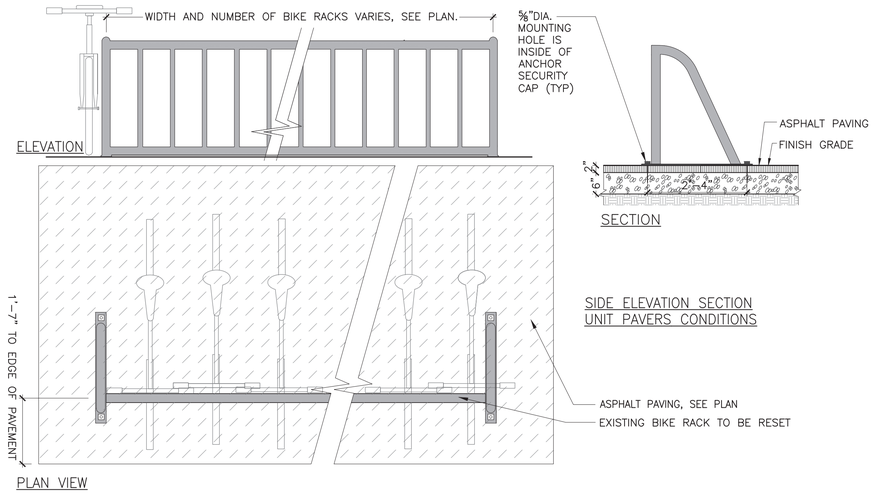


NOTES:

1. PROVIDE FULL SHOP DRAWINGS.
2. THERMAL FINISH ALL EXPOSED SIDES, TYP.
3. THIS DETAIL IS A TYPICAL SECTION, SEE PLANS FOR SPECIFIC NUMBER OF TREADS/ RISERS AT EACH STAIR LOCATION.
4. SEE PLAN FOR LENGTH OF HANDRAIL EXTENSION FOR EACH LOCATION.

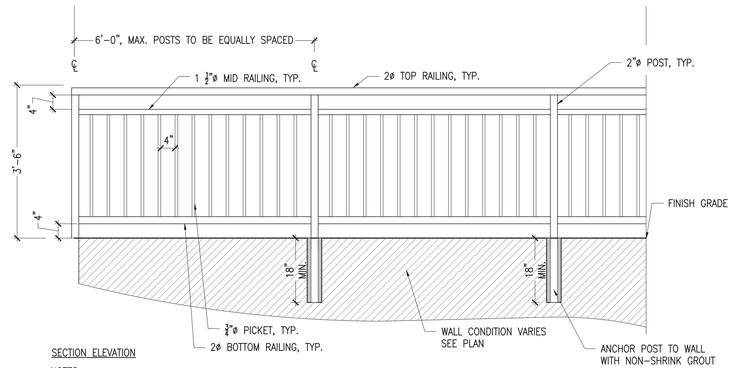
3 GRANITE STAIRS

SCALE: 1/2" = 1'-0"



4 BIKE RACK

SCALE: 3/4" = 1'-0"



SECTION ELEVATION

NOTES:

1. ALL POSTS SHALL BE SET PLUMB. ALL RAILS SHALL BE PARALLEL TO GRADE, TYP.
2. POWDERCOAT PAINT COLOR TO BE BLACK.

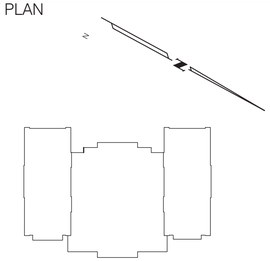
5 GUARDRAIL

SCALE: 3/4" = 1'-0"

LEGEND / NOTES

CASE #22-12

KEY PLAN



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No.	ISSUE	DATE
4	100% DESIGN DEVELOPMENT	03/09/22
3	SCHEMATIC DESIGN PRICING	01/26/22
2	SCHEMATIC DESIGN PRICING	01/07/22
1	SCHEMATIC DESIGN PRICING	08/20/21

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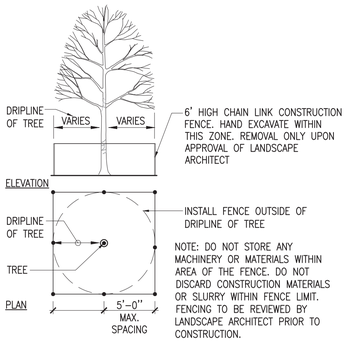
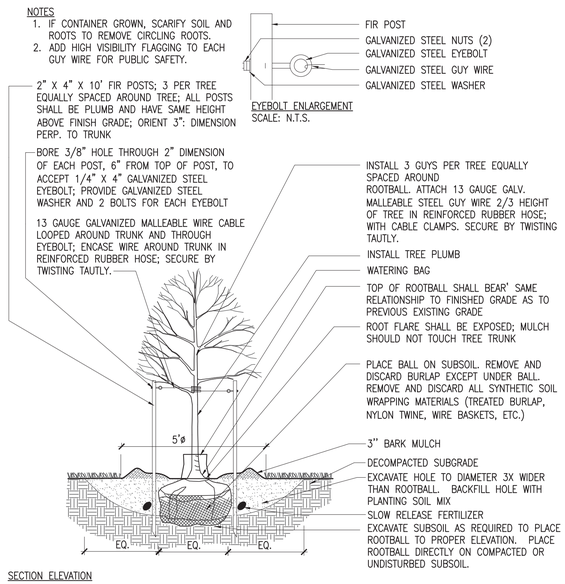
LANDSCAPE DETAILS

PROJECT NO: A21010
CAD FILE NO: XR-DETAILS.DWG
DRAWING NO: L2.02



1 TREE PROTECTION FENCING

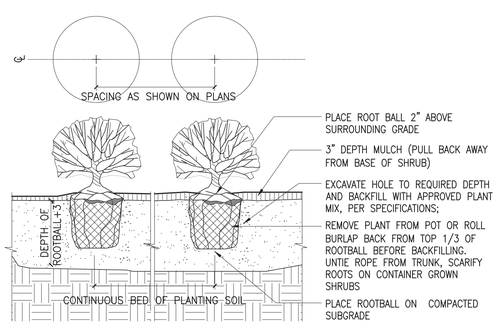
SCALE: 3/16" = 1'-0"



SECTION ELEVATION

2 DECIDUOUS TREE

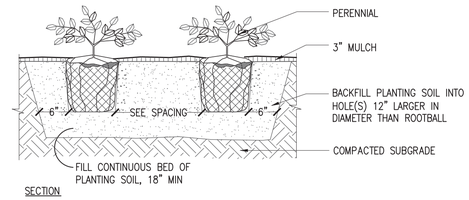
SCALE: 3/4" = 1'-0"



SECTION

3 SHRUB PLANTING

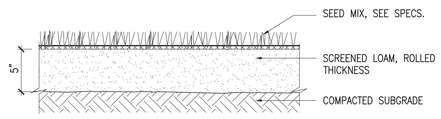
SCALE: 1 1/2" = 1'-0"



SECTION

4 PERENNIAL PLANTING

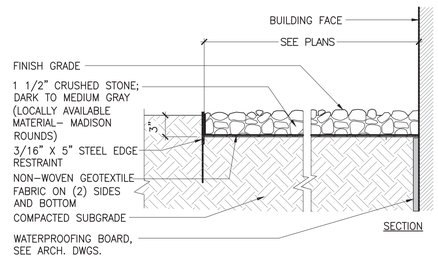
SCALE: 1 1/2" = 1'-0"



SECTION

5 SEED MIX

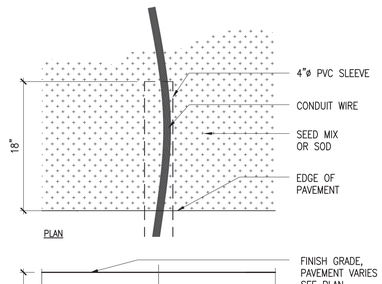
SCALE: 1 1/2" = 1'-0"



SECTION

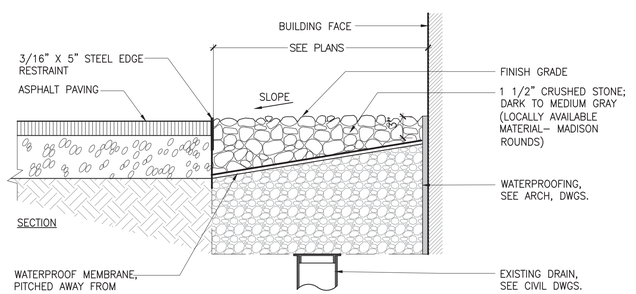
6 STONE DRIP EDGE

SCALE: 1 1/2" = 1'-0"



7 IRRIGATION SLEEVE

SCALE: 1 1/2" = 1'-0"



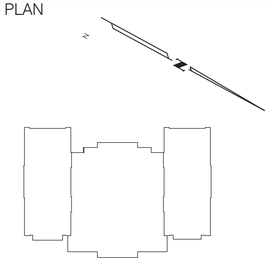
8 DRIP EDGE WITH DRAINAGE

SCALE: 1 1/2" = 1'-0"

LEGEND / NOTES

CASE #22-12

KEY PLAN



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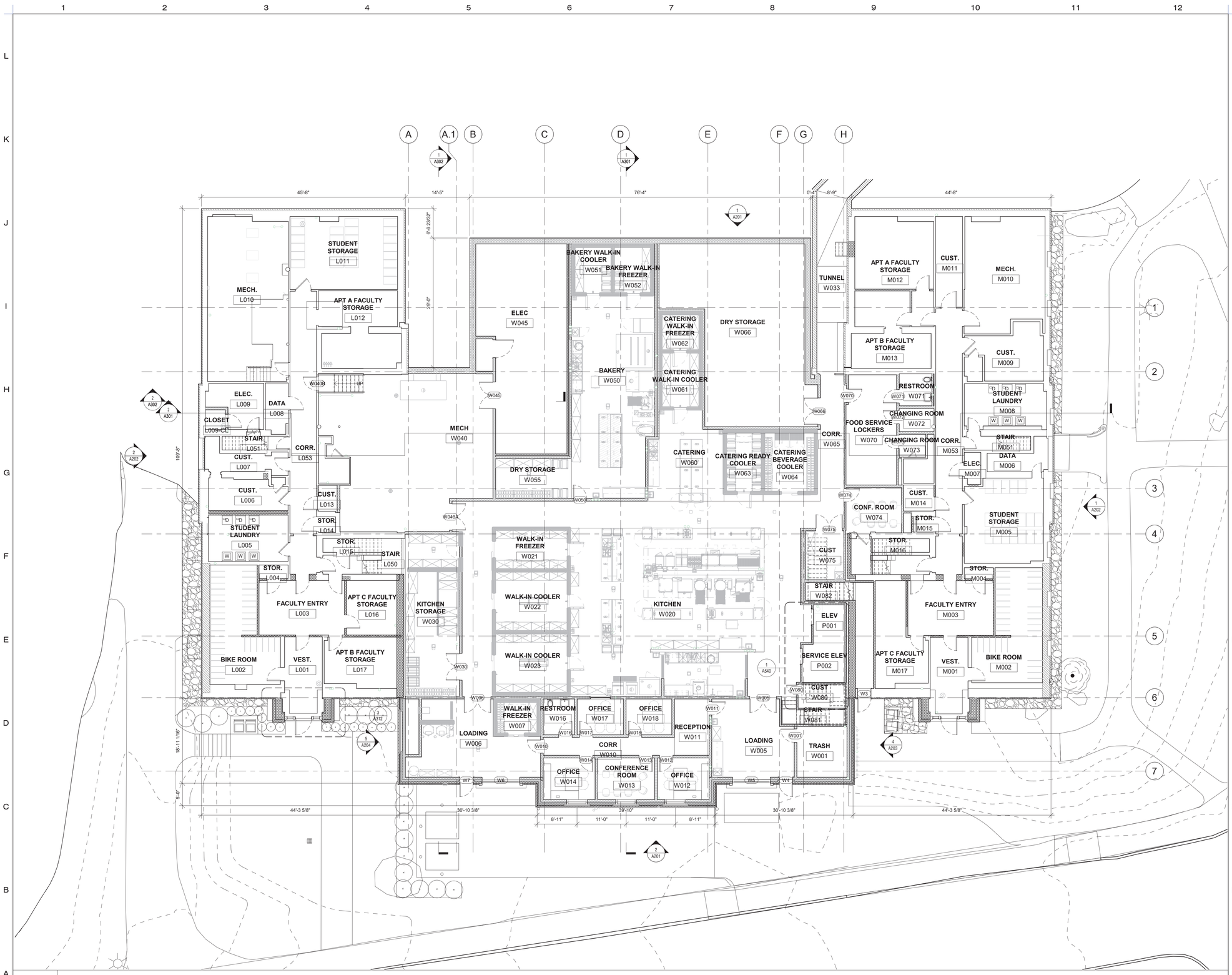
LANDSCAPE DETAILS

PROJECT NO: A21010
CAD FILE NO: XR-DETAILS.DWG
DRAWING NO: L2.03



1 LOWER LEVEL PLAN

1/8" = 1'-0"

3/11/2022 6:04:29 PM

LEGEND / NOTES

CASE #22-12

LEGEND - PROPOSED PLAN

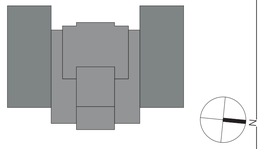
NEW CONSTRUCTION

EXISTING TO REMAIN WALLS

GENERAL NOTES - FLOOR PLANS:

1. FF&E NOT IN CONTRACT.
2. KITCHEN EQUIPMENT SHOWN FOR REFERENCE - SEE QF DRAWINGS

KEY PLAN



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1	50% Design Development	01/28/2022

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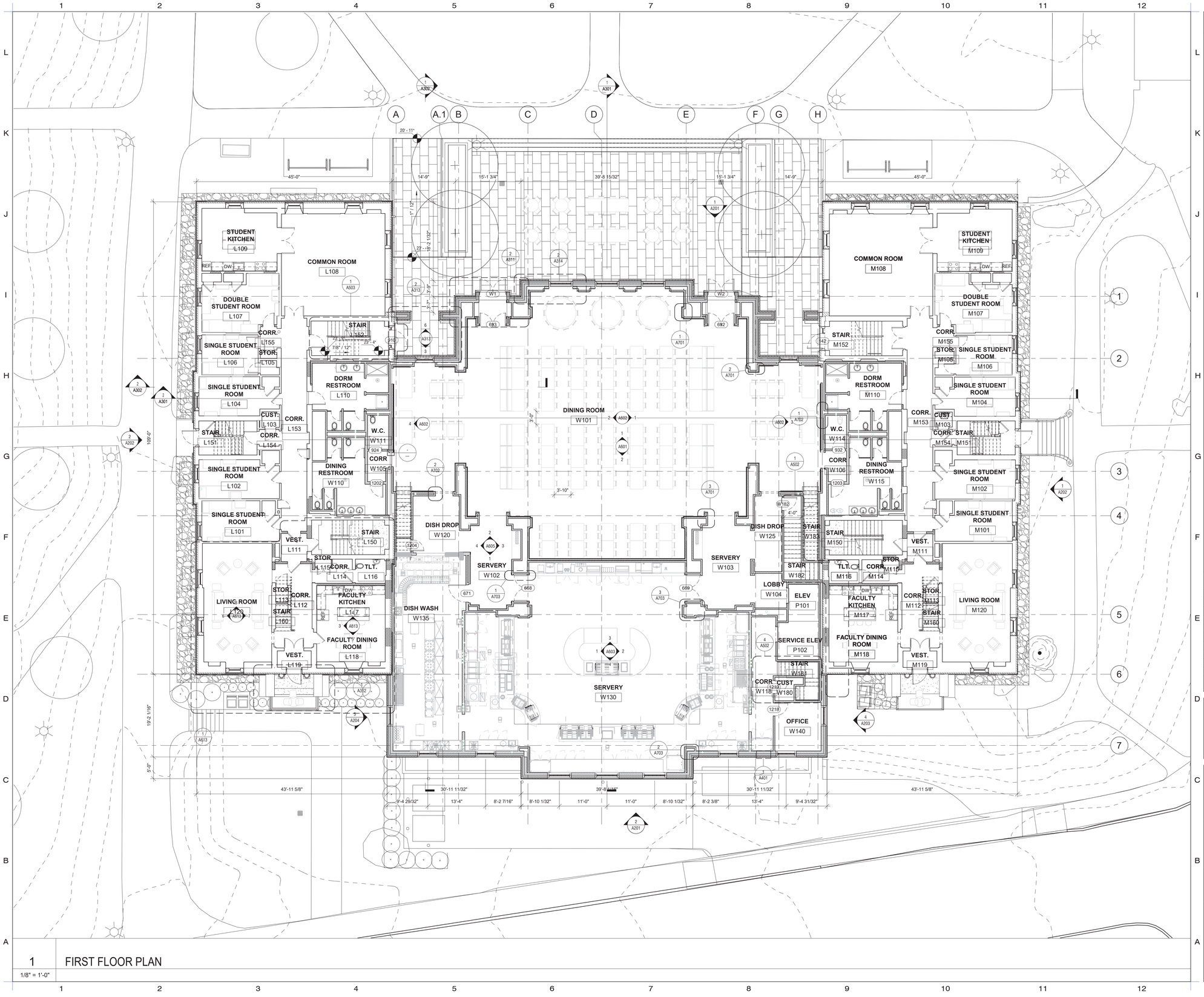
LOWER LEVEL PLAN

Project No.	A21010
CAD File No.	A21010
Drawing No.	A101



1 FIRST FLOOR PLAN

1/8" = 1'-0"

3/11/2022 6:04:53 PM

LEGEND / NOTES

CASE #22-12

LEGEND - PROPOSED PLAN

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KEY PLAN

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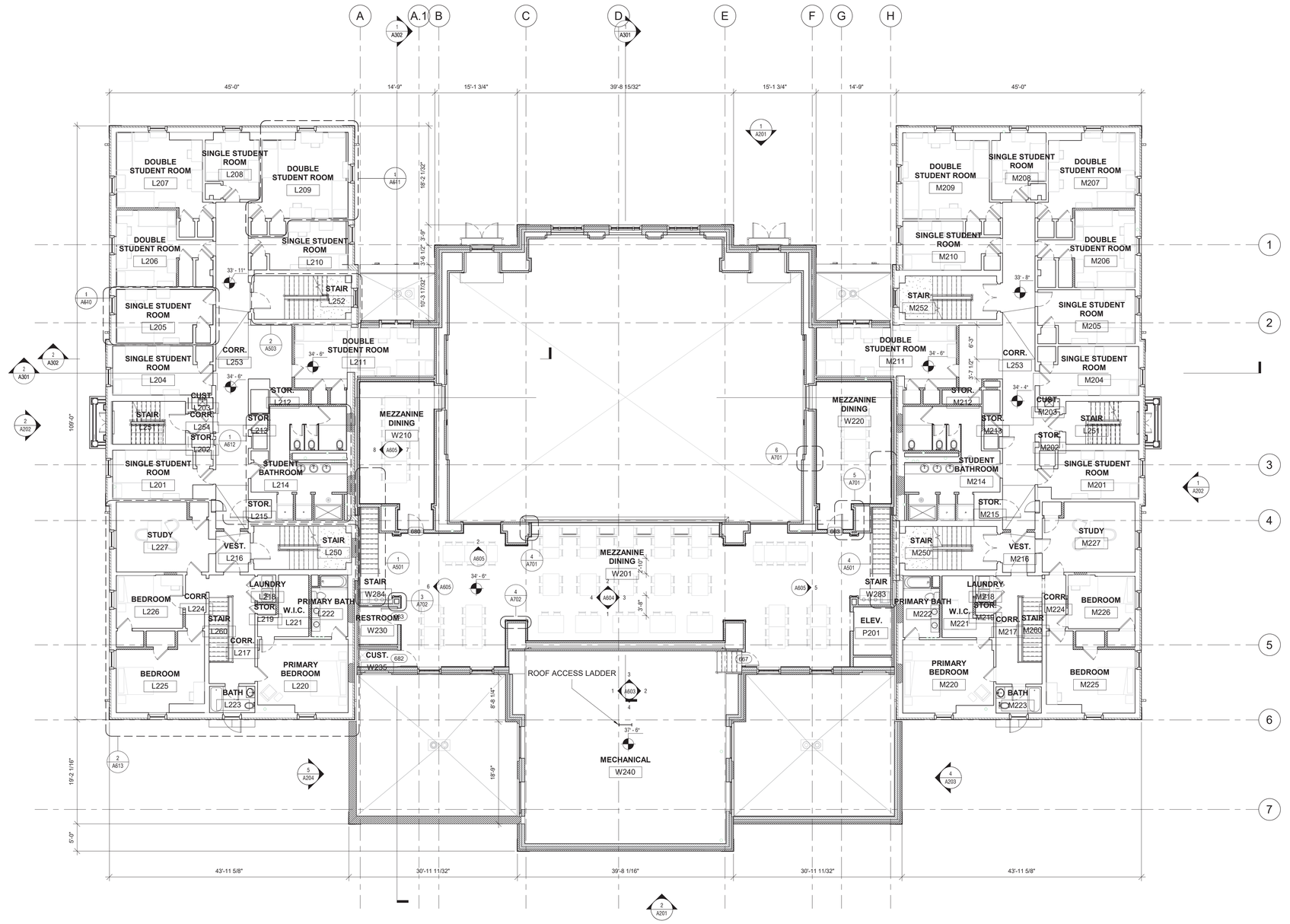
FIRST FLOOR PLAN

Project No. A21010

CAD File No. A21010

Drawing No. A102



1 SECOND FLOOR PLAN

1/8" = 1'-0"

3/11/2022 6:05:03 PM

LEGEND / NOTES

CASE #22-12

LEGEND - PROPOSED PLAN

NEW CONSTRUCTION

EXISTING TO REMAIN WALLS

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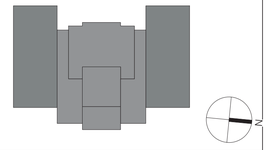
KEY PLAN



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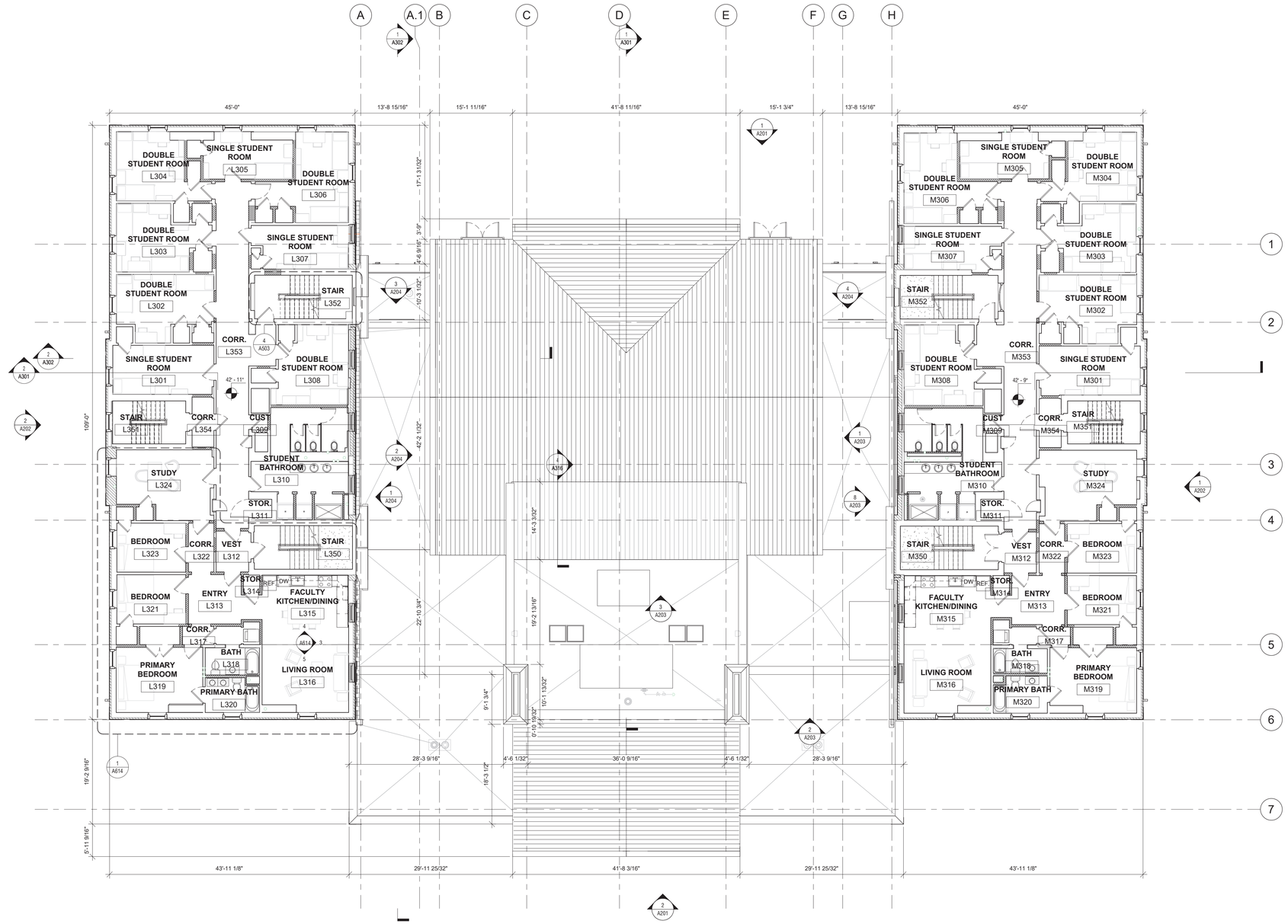
SECOND FLOOR PLAN

Project No. A21010

CAD File No. A21010

Drawing No. A103



1 THIRD FLOOR PLAN

1/8" = 1'-0"

3/11/2022 6:05:07 PM

LEGEND / NOTES

CASE #22-12

LEGEND - PROPOSED PLAN

NEW CONSTRUCTION

EXISTING TO REMAIN WALLS

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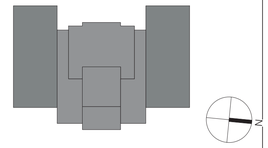
KEY PLAN



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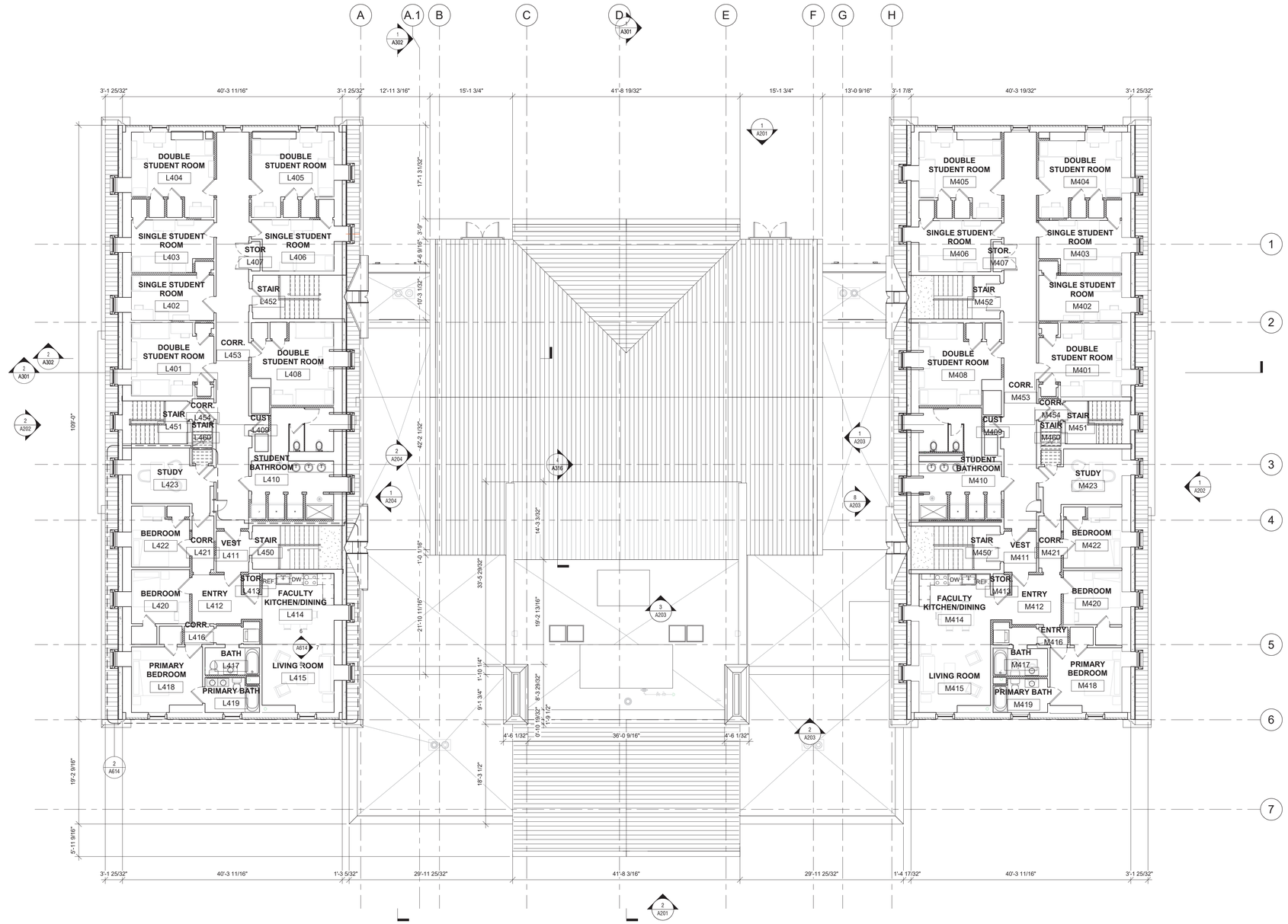
THIRD FLOOR PLAN

Project No. A21010

CAD File No. A21010

Drawing No. A104



1 FOURTH FLOOR PLAN

1/8" = 1'-0"

3/11/2022 6:05:11 PM

LEGEND / NOTES

CASE #22-12

LEGEND - PROPOSED PLAN

NEW CONSTRUCTION

EXISTING TO REMAIN WALLS

GENERAL NOTES - FLOOR PLANS:

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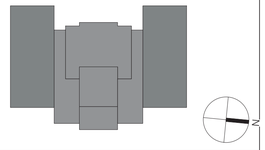
2. KITCHEN EQUIPMENT SHOWN FOR REFERENCE - SEE QF DRAWINGS

KEY PLAN



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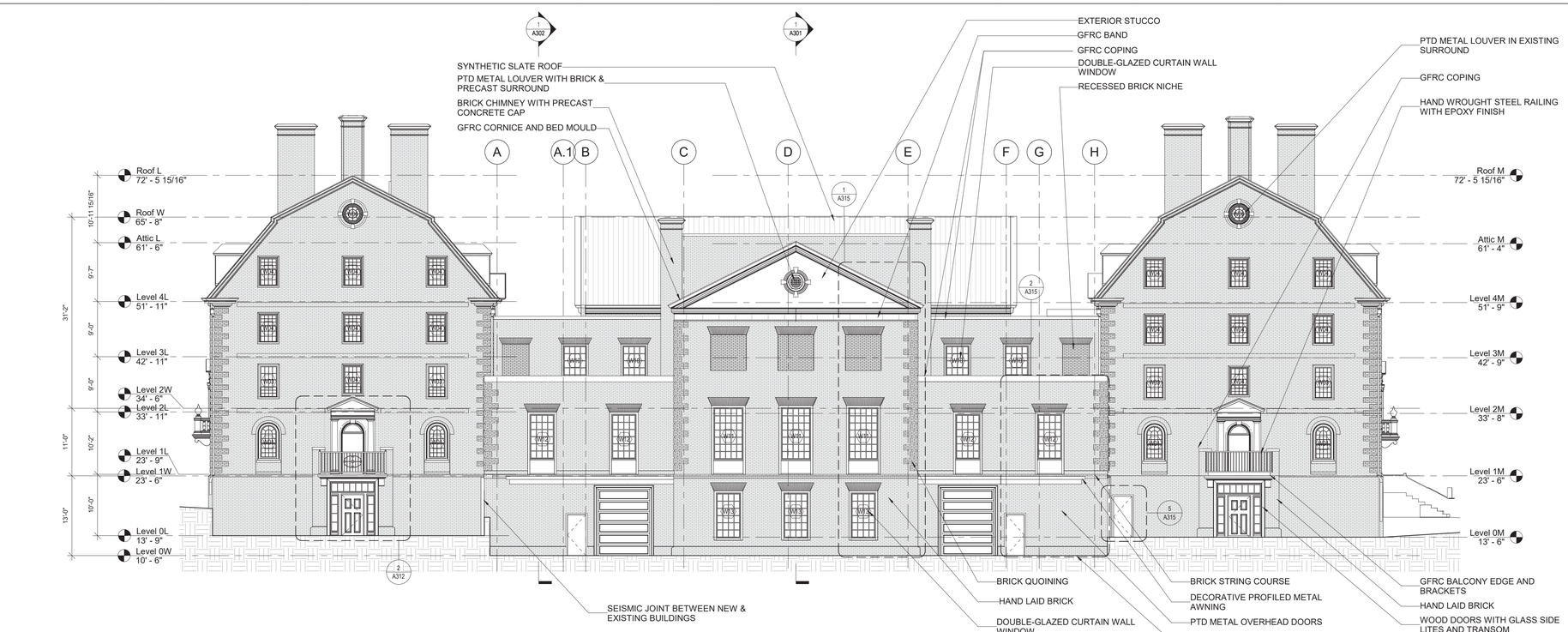
FOURTH FLOOR PLAN

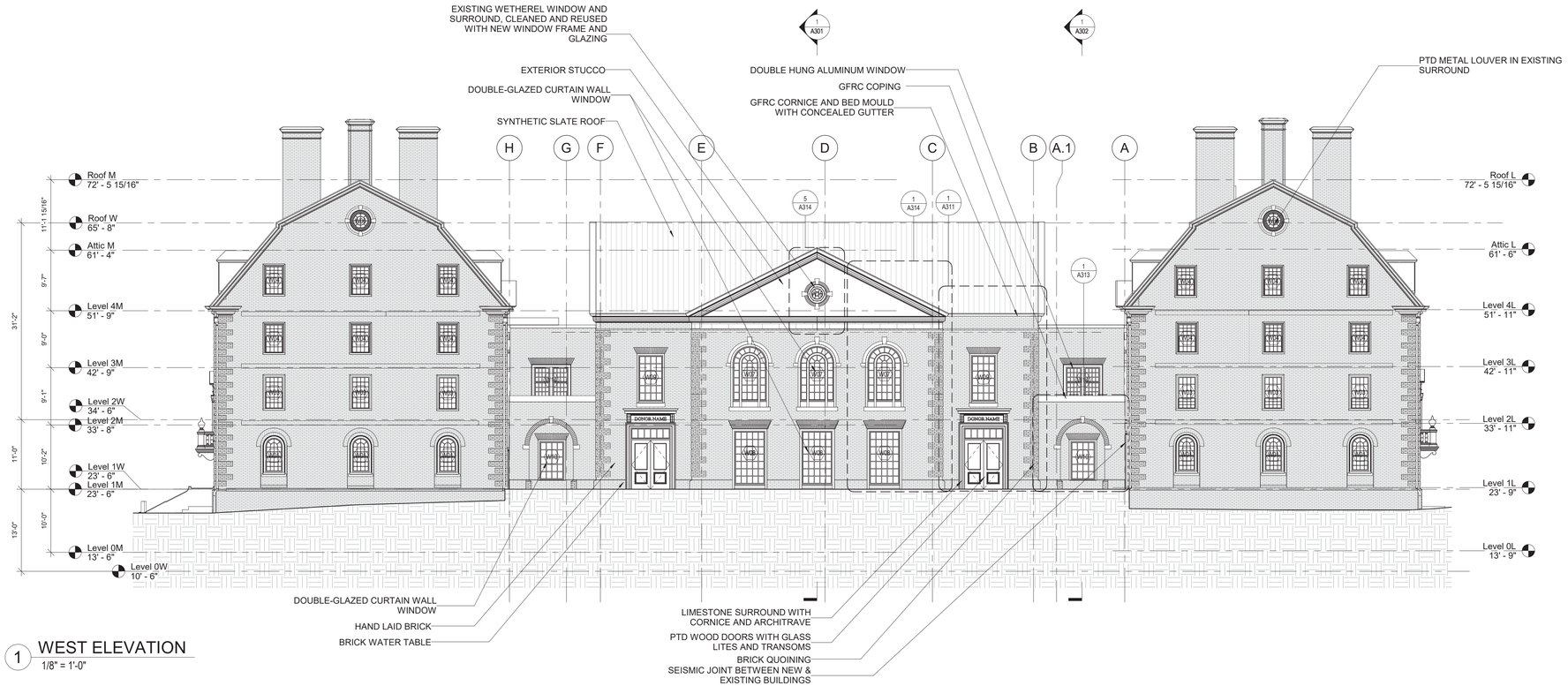
Project No. A21010

CAD File No. A21010

Drawing No. A105



2 EAST ELEVATION
1/8" = 1'-0"



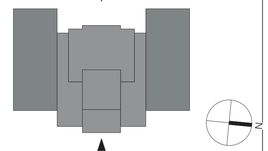
1 WEST ELEVATION
1/8" = 1'-0"

3/11/2022 6:07:42 PM

LEGEND / NOTES

CASE #22-12

KEY PLAN



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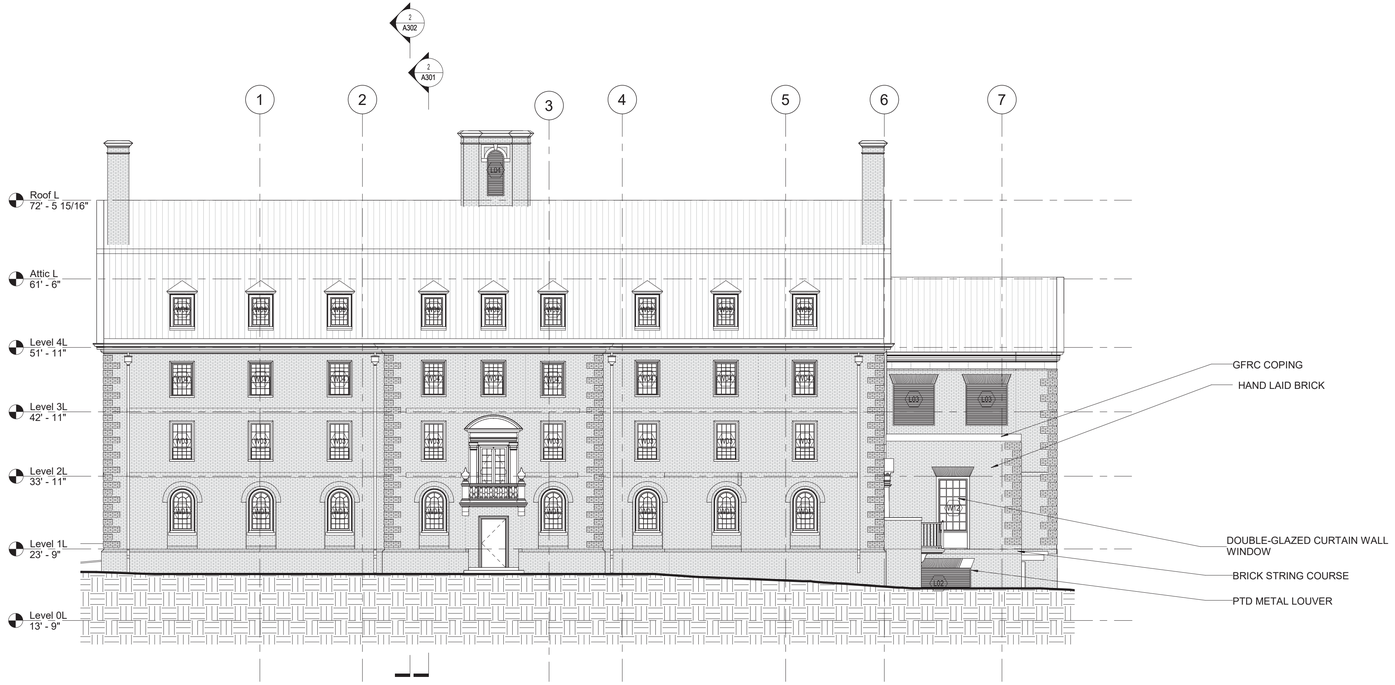
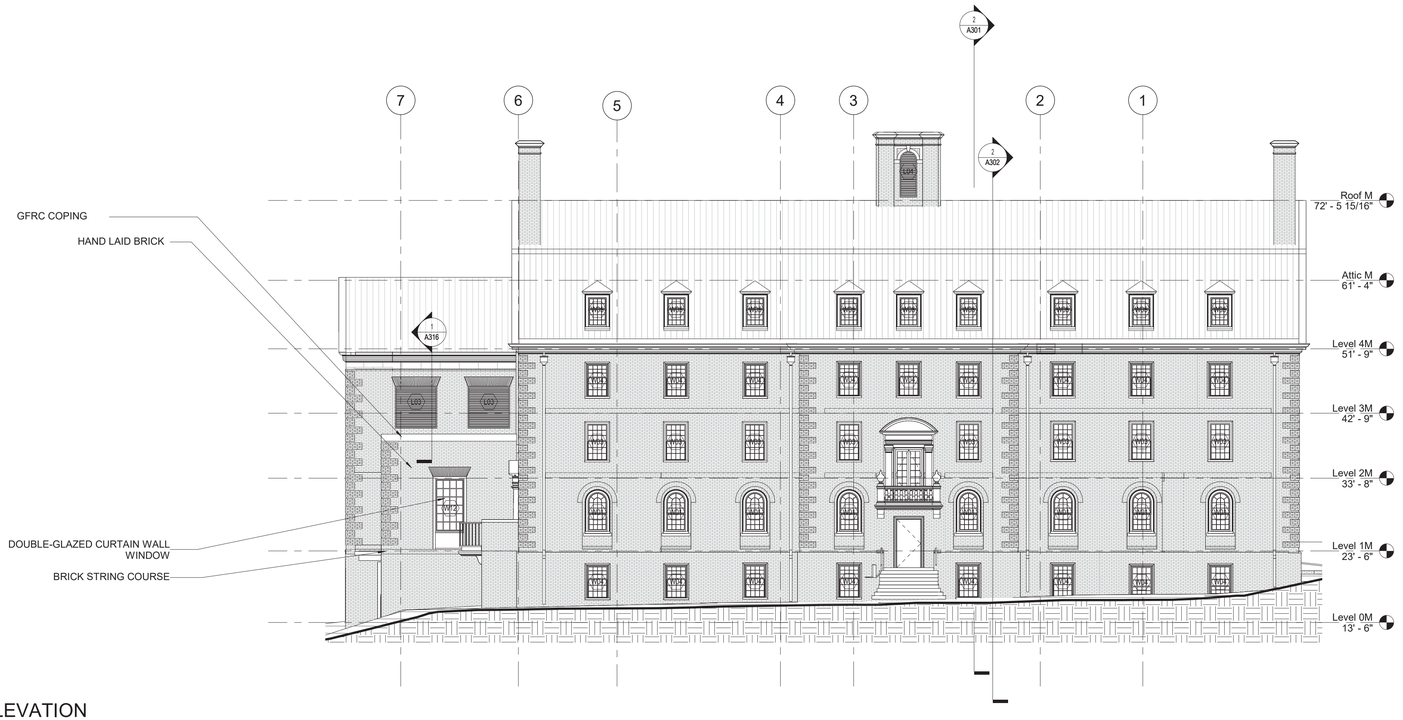
EXTERIOR ELEVATIONS

Project No.	A21010
CAD File No.	A21010
Drawing No.	A201



2 SOUTH ELEVATION
1/8" = 1'-0"



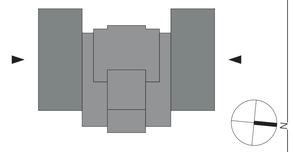
1 NORTH ELEVATION
1/8" = 1'-0"

3/11/2022 6:07:51 PM

LEGEND / NOTES

CASE #22-12

KEY PLAN



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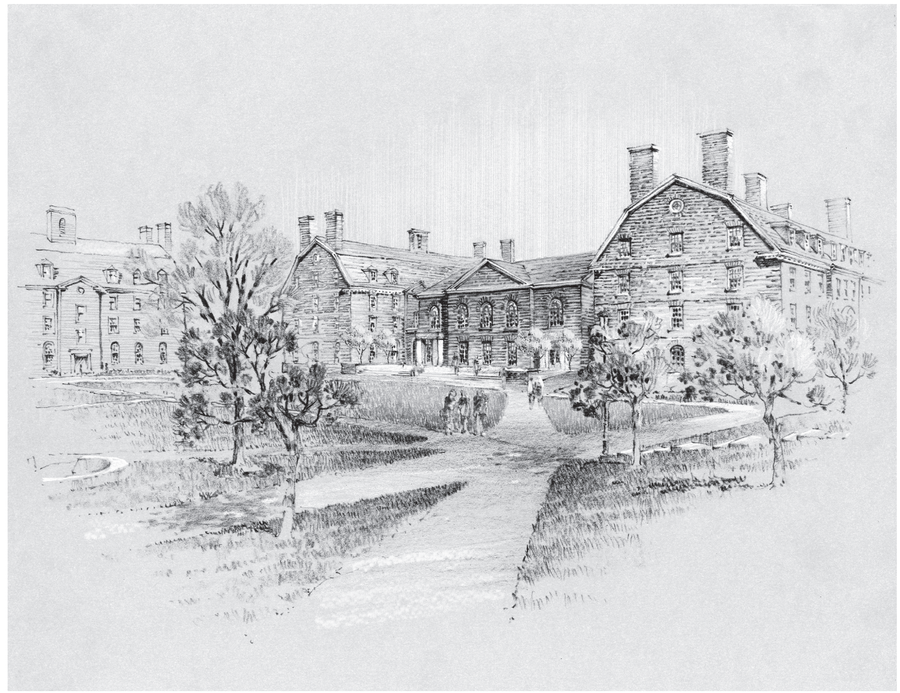
EXTERIOR ELEVATIONS

Project No.	A21010
CAD File No.	A21010
Drawing No.	A202

VIEW FROM NORTHEAST

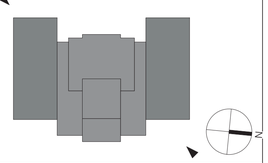


VIEW FROM SOUTHWEST

LEGEND / NOTES

CASE #22-12

KEY PLAN



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STREET VIEW

Project No.	A21010
CAD File No.	A21010
Drawing No.	A900

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